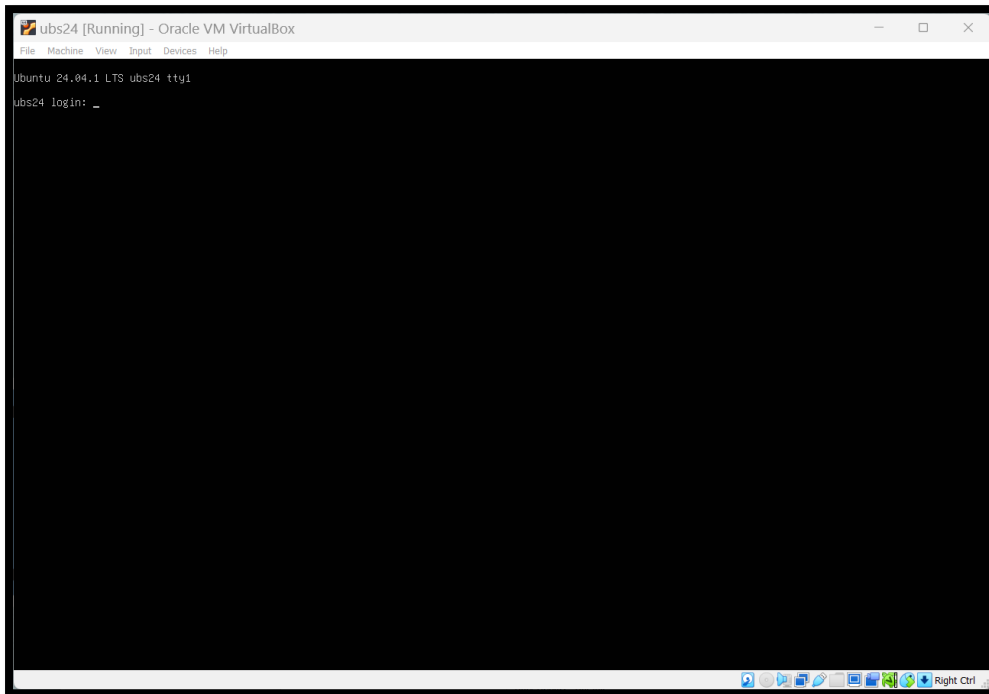
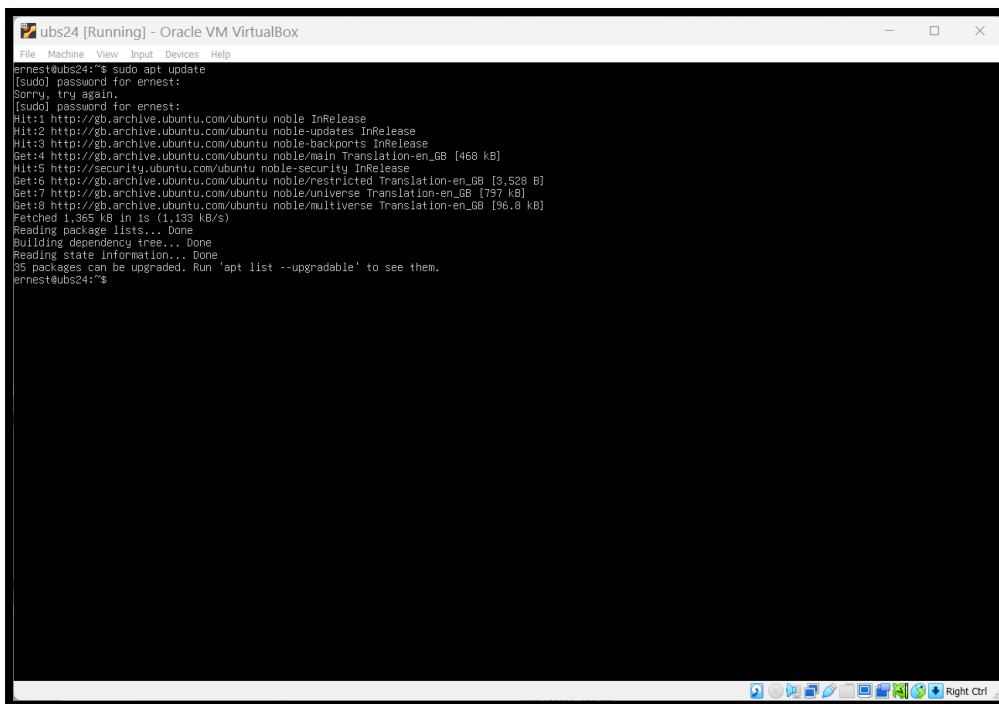


LAMP stack Web Server lab

First logged into my Ubuntu server.



Login to server



Update server.

```
Ubuntu24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubuntu24:~$ sudo apt update
[sudo] password for ernest:
Sorry, try again.
[sudo] password for ernest:
Hit:1 http://gb.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://gb.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://gb.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:4 http://gb.archive.ubuntu.com/ubuntu noble/main Translation-en_GB [468 kB]
Hit:5 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:6 http://gb.archive.ubuntu.com/ubuntu noble/restricted Translation-en_GB [3,528 B]
Get:7 http://gb.archive.ubuntu.com/ubuntu noble/universe Translation-en_GB [797 kB]
Get:8 http://gb.archive.ubuntu.com/ubuntu noble/multiverse Translation-en_GB [96.8 kB]
Fetched 1,365 kB in 1s (1,133 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
35 packages can be upgraded, Run 'apt list --upgradable' to see them.
ernest@ubuntu24:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following upgrades have been deferred due to phasing:
  python3-distupgrade ubuntu-release-upgrader-core
The following packages will be upgraded:
  apparmor cloud-init cloud-initramfs-copymods cloud-initramfs-dyn-netconf cryptsetup cryptsetup-bin cryptsetup-initramfs dmidevent dmsetup fwupd
  initramfs-tools initramfs-tools-bin initramfs-tools-core libapparmor1 libcryptsetup12 libdevmapper-event1.02.1 libdevmapper1.02.1 libfwupd2 liblvm2cmd2.03
  libproc2-0 libzstd1 lxd-agent-loader ndmdu open-vm-tools overlayroot procs python3-update-manager systemd-hwdb tpm2 tpm2-udev ubuntu-drivers-common ubuntu-pro-client
  ubuntu-pro-client-l10n update-manager-core
33 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
Need to get 11.9 MB of archives.
After this operation, 242 kB of additional disk space will be used.
Do you want to continue? [Y/n] _
```

Upgrade packages

```
Ubuntu24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
done
Setting up initramfs-tools-bin (0.142ubuntu25.2) ...
Setting up cryptsetup-bin (2:2.7.0-1ubuntu4.1) ...
Setting up ubuntu-pro-client-l10n (34~24.04) ...
Setting up cloud-init (24.0.1-0ubuntu0~24.04.2) ...
Installing new version of config file /etc/cloud/cloud.cfg ...
Installing new version of config file /etc/cloud/templates/sources.list.ubuntu.deb922.tmpl ...
Setting up libdevmapper-event1.02.1:amd64 (2:1.02.185-3ubuntu3.1) ...
Setting up cryptsetup (2:2.7.0-1ubuntu4.1) ...
Setting up update-manager-core (1:24.04.0) ...
Setting up initramfs-tools-core (0.142ubuntu25.2) ...
Setting up initramfs-tools (0.142ubuntu25.2) ...
update-initramfs: deferring update (trigger activated)
Setting up cloud-initramfs-copymods (0.49~24.04.1) ...
Setting up cloud-initramfs-dyn-netconf (0.49~24.04.1) ...
Setting up overlayroot (0.49~24.04.1) ...
Setting up cryptsetup-initramfs (2:2.7.0-1ubuntu4.1) ...
update-initramfs: deferring update (trigger activated)
Setting up liblvm2cmd2.03:amd64 (2.03.16-3ubuntu3.1) ...
Setting up dmideventd (2:1.02.185-3ubuntu3.1) ...
dm-event.service is a disabled or a static unit not running, not starting it.
Setting up lvm2 (2.03.16-3ubuntu3.1) ...
Processing triggers for dbus (1.14.10-4ubuntu4.1) ...
Processing triggers for udev (255.4-1ubuntu8.4) ...
Processing triggers for debiannutils (5.17build1) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Processing triggers for rsyslog (8.2312.0-3ubuntu9) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for initramfs-tools (0.142ubuntu25.2) ...
update-initramfs: Generating /boot/initrd.img-6.8.0-45-generic
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
/etc/needrestart/restart.d/systemd-manager
systemctl restart multipathd.service udisks2.service

Service restarts being deferred:
/etc/needrestart/restart.d/dbus.service

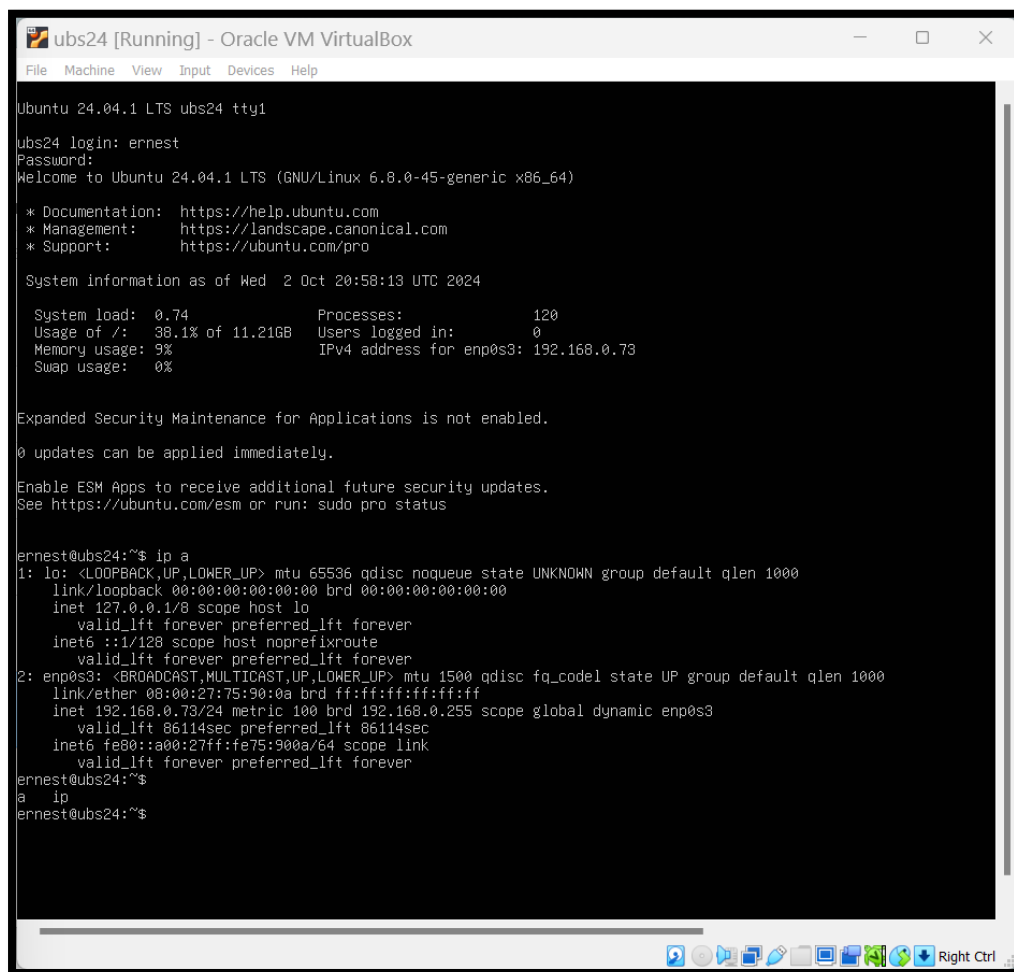
No containers need to be restarted.

User sessions running outdated binaries:
ernest @ user manager service: systemd[1190]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubuntu24:~$
```

Now up to date.

Static IP address must be set first for the web server



```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Ubuntu 24.04.1 LTS ubs24 tty1

ubs24 login: ernest
Password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-45-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Wed 2 Oct 20:58:13 UTC 2024

System load:  0.74           Processes:            120
Usage of /:   38.1% of 11.21GB Users logged in:           0
Memory usage: 9%            IPv4 address for enp0s3: 192.168.0.73
Swap usage:   0%

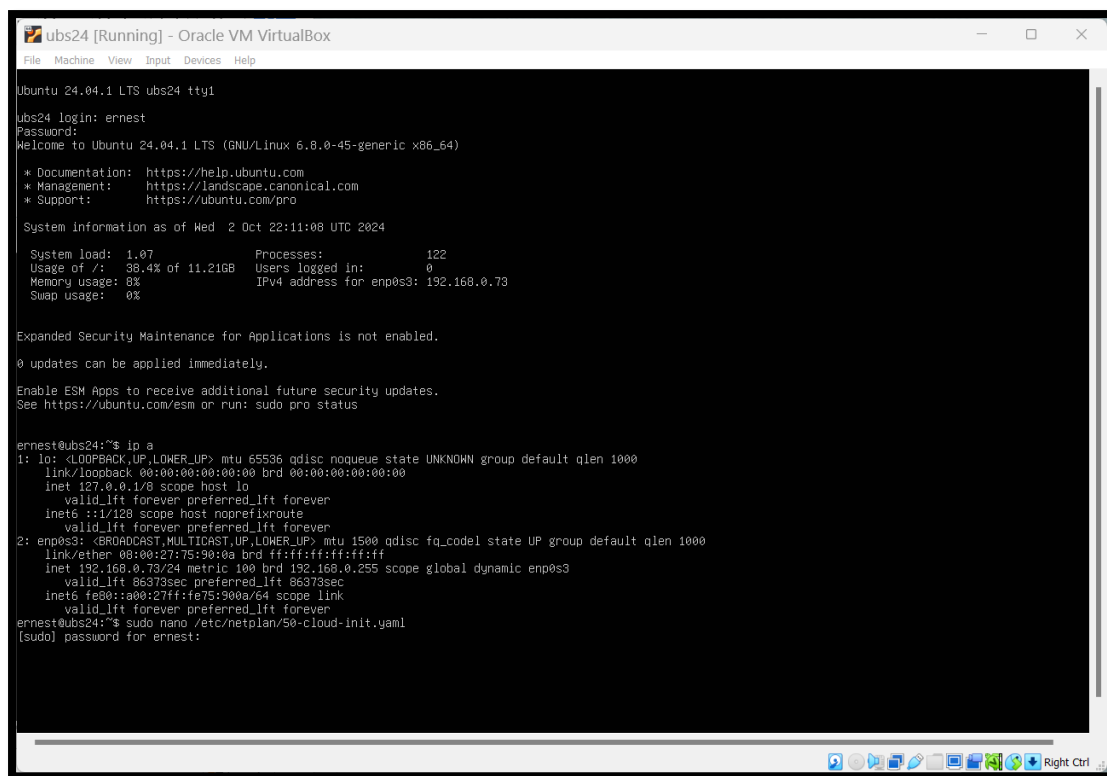
Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

ernest@ubs24:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:75:90:0a brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.73/24 metric 100 brd 192.168.0.255 scope global dynamic enp0s3
        valid_lft 86114sec preferred_lft 86114sec
    inet6 fe80::a00:27ff:fe75:900a/64 scope link
        valid_lft forever preferred_lft forever
ernest@ubs24:~$
a ip
ernest@ubs24:~$
```

First find out the IP address for the server type IP a. This is the device name/ network interface: Enp0S3 and IP address 192.168.0.73/24.



```
Ubuntu 24.04.1 LTS ubi24 tty1
ubi24 login: ernest
Password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-45-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Wed 2 Oct 22:11:08 UTC 2024

System load:  1.07               Processes:    122
Usage of /:   38.4% of 11.21GB   Users logged in: 0
Memory usage: 8%                IPv4 address for enp0s3: 192.168.0.73
Swap usage:  0%

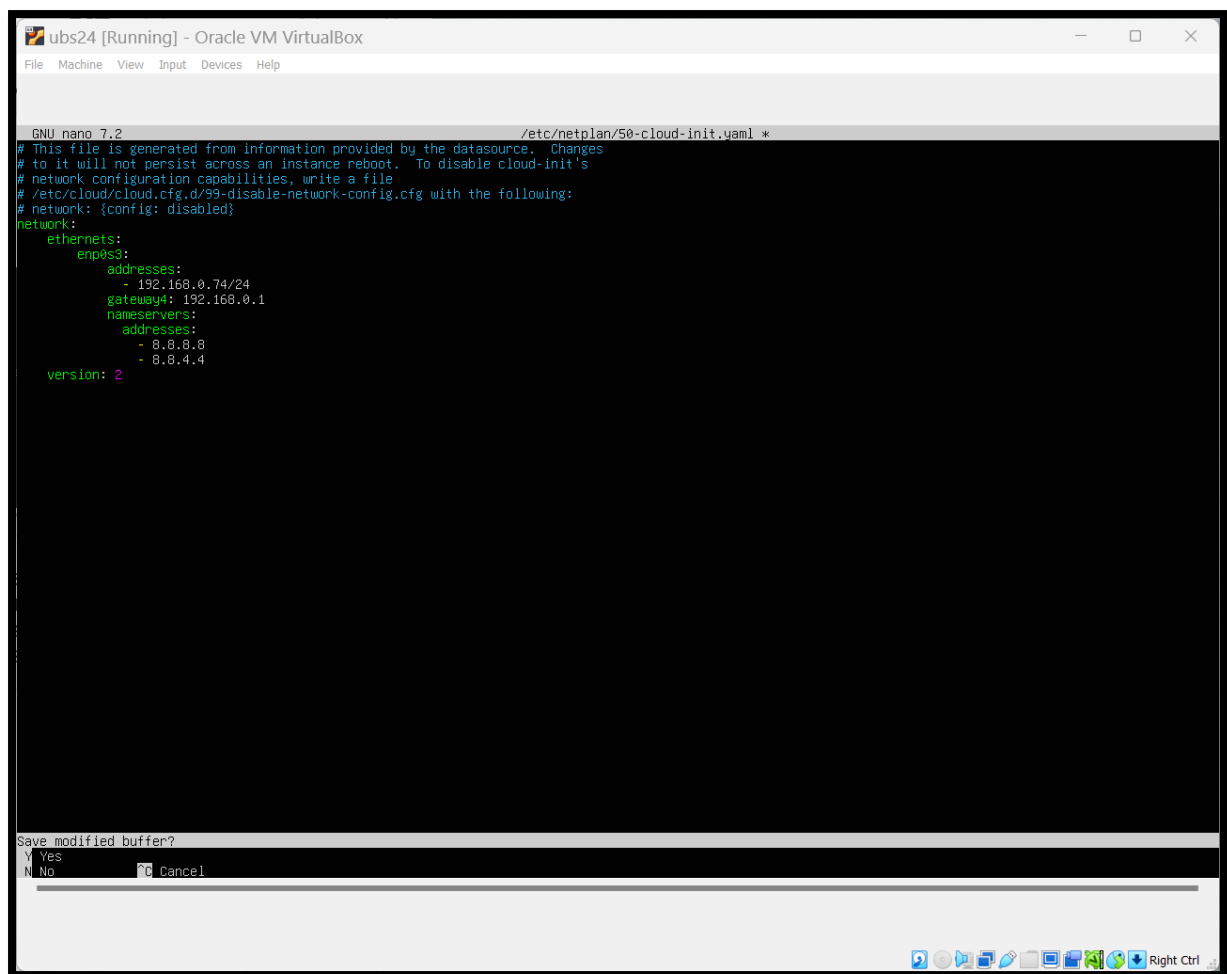
Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

ernest@ubi24:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:75:90:0a brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.73/24 metric 100 brd 192.168.0.255 scope global dynamic enp0s3
        valid_lft 86373sec preferred_lft 86373sec
    inet6 fe80::a00:27ff:fe75:900a/64 scope link
        valid_lft forever preferred_lft forever
ernest@ubi24:~$ sudo nano /etc/netplan/50-cloud-init.yaml
[sudo] password for ernest:
```

Now to edit the configuration Ubuntu 24.04 uses an application called net plan for network configuration. We'll edit the net plan configuration file to set a static IP address. Use any text editor the one I will use is Nano. The command for this is `sudo nano /etc/netplan/50-cloud-init.yaml`. The easiest way to find the file name is to hit the tab key twice after typing up to `netplan/` part of the command.

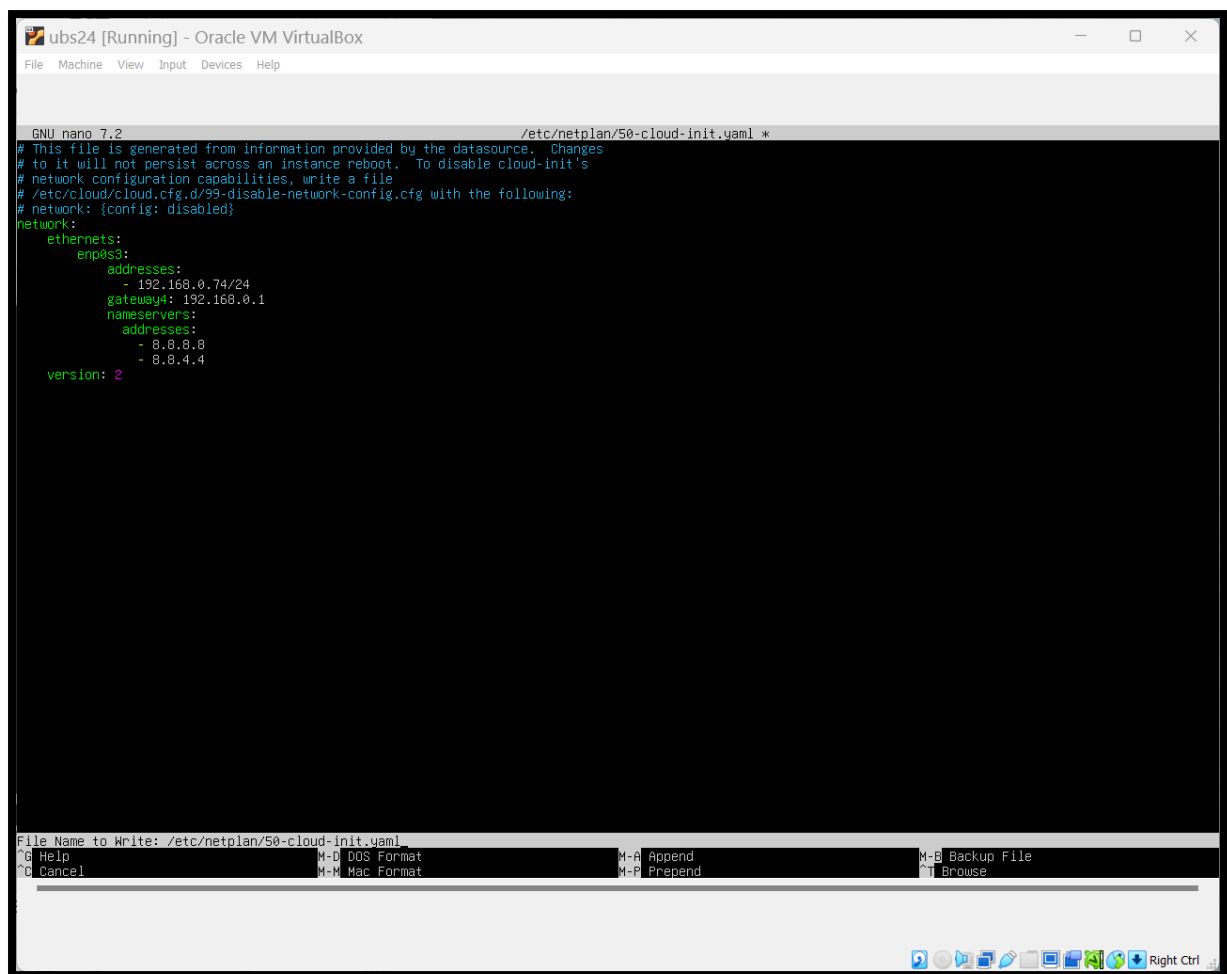


The screenshot shows a VirtualBox window titled "ubs24 [Running] - Oracle VM VirtualBox". Inside the window is a terminal running GNU nano 7.2, editing the file `/etc/netplan/50-cloud-init.yaml`. The file content is as follows:

```
# This file is generated from information provided by the datasource. Changes
# to it will not persist across an instance reboot. To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernets:
    enp0s3:
      addresses:
        - 192.168.0.74/24
      gateway4: 192.168.0.1
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
      version: 2
```

At the bottom of the terminal, a prompt asks "Save modified buffer?". The user has entered 'y' for Yes, and the prompt shows "Y Yes" and "N No" with a cursor next to "Cancel".

-8.8.8.8 are the google name servers. Ctrl-x to exit and then save. Type y for yes.



The screenshot shows a VirtualBox window titled "ubs24 [Running] - Oracle VM VirtualBox". Inside the window, a terminal window is open, displaying the GNU nano 7.2 editor. The editor is editing the file `/etc/netplan/50-cloud-init.yaml`. The content of the file is as follows:

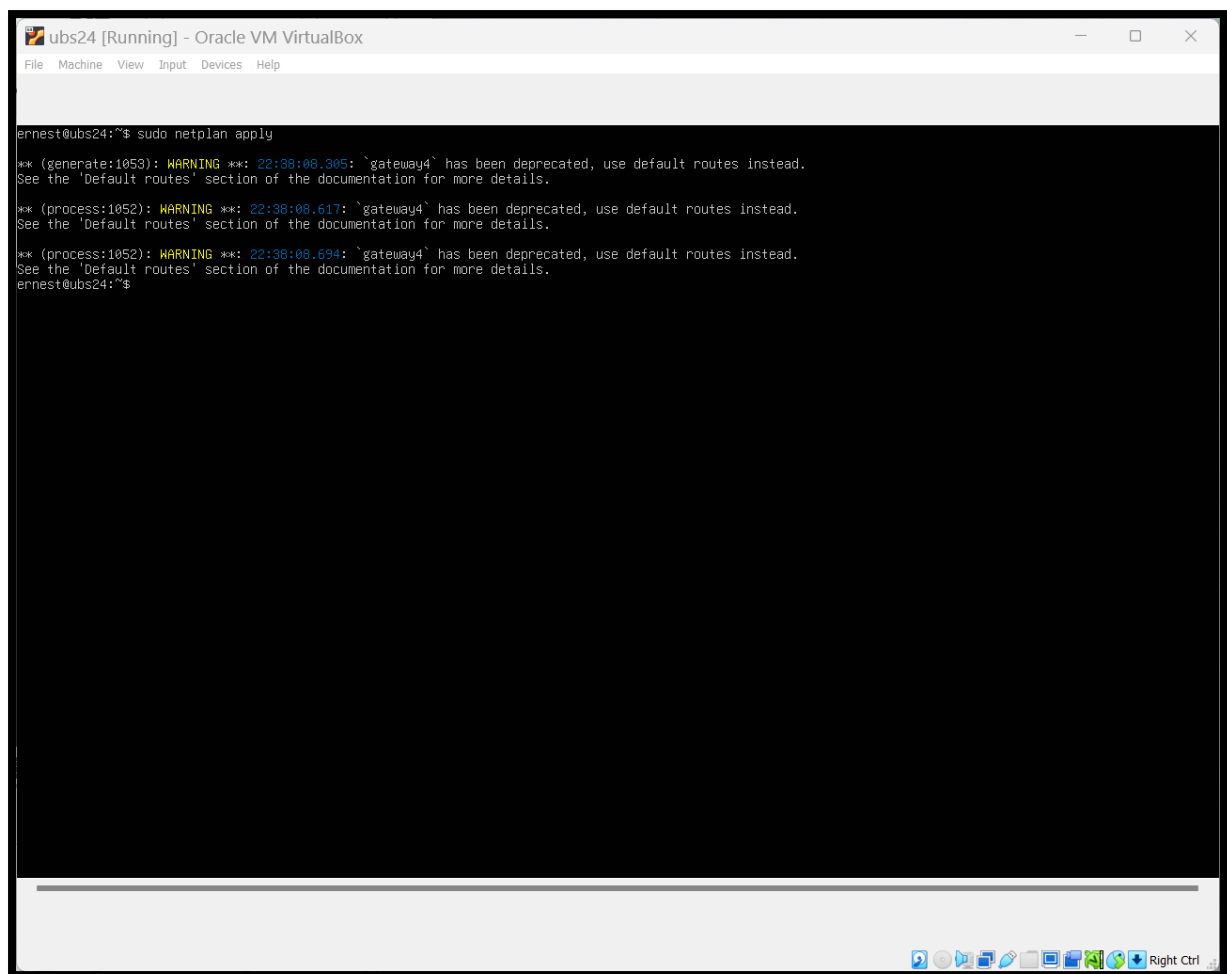
```
# This file is generated from information provided by the datasource. Changes
# to it will not persist across an instance reboot. To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernets:
    enp0s3:
      addresses:
        - 192.168.0.74/24
      gateway4: 192.168.0.1
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
  version: 2
```

At the bottom of the terminal window, there is a prompt "File Name to Write: /etc/netplan/50-cloud-init.yaml" and a menu with the following options:

| | | | |
|----------|----------------|-------------|-----------------|
| ⌘ Help | ⌘-D DOS Format | ⌘-A Append | ⌘-B Backup File |
| ⌘ Cancel | ⌘-M Mac Format | ⌘-P Prepend | ⌘ Browse |

The bottom of the window shows the VirtualBox toolbar and the system tray with the date and time "Right Ctrl".

Press enter.



```
ernest@ubs24:~$ sudo netplan apply
** (generate:1053): WARNING **: 22:38:08.305: `gateway4` has been deprecated, use default routes instead.
See the 'Default routes' section of the documentation for more details.
** (process:1052): WARNING **: 22:38:08.617: `gateway4` has been deprecated, use default routes instead.
See the 'Default routes' section of the documentation for more details.
** (process:1052): WARNING **: 22:38:08.694: `gateway4` has been deprecated, use default routes instead.
See the 'Default routes' section of the documentation for more details.
ernest@ubs24:~$
```

Now apply the changes to change to the static IP address.

```
ubns24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

ernest@ubns24:~$ sudo netplan apply
** (generate:1053): WARNING **: 22:38:08.305: `gateway4` has been deprecated, use default routes instead.
See the 'Default routes' section of the documentation for more details.
** (process:1052): WARNING **: 22:38:08.617: `gateway4` has been deprecated, use default routes instead.
See the 'Default routes' section of the documentation for more details.
** (process:1052): WARNING **: 22:38:08.694: `gateway4` has been deprecated, use default routes instead.
See the 'Default routes' section of the documentation for more details.
ernest@ubns24:~$ ssh 192.168.0.74
The authenticity of host '192.168.0.74 (192.168.0.74)' can't be established.
ED25519 key fingerprint is SHA256:wpLRNyKxP4tavIng7mIZHhV0tu4W1yAt4PINzvRSIU.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '192.168.0.74' (ED25519) to the list of known hosts.
ernest@192.168.0.74's password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-45-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Wed 2 Oct 22:43:27 UTC 2024

System load:  0.0          Processes:      117
Usage of /:   38.5% of 11.2TB  Users logged in: 1
Memory usage: 9%          IPv4 address for enp0s3: 192.168.0.74
Swap usage:  0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

ernest@ubns24:~$ _
```

Type ssh new static IP address type yes put in password and now the new Static IP address has been added.

To see the network configuration plan type the command of `sudo cat/etc/netplan/50-cloud-int.yaml`. Tab after `netplan/` to find the right file for your system.

```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

ernest@ubs24:~$ sudo cat /etc/netplan/50-cloud-init.yaml
# This file is generated from information provided by the datasource.  Changes
# to it will not persist across an instance reboot.  To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernets:
    enp0s3:
      addresses:
        - 192.168.0.74/24
      gateway4: 192.168.0.1
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
      version: 2
ernest@ubs24:~$ ping google.com
PING google.com (172.217.16.238) 56(84) bytes of data:
64 bytes from mad08s04-in-f14.1e100.net (172.217.16.238): icmp_seq=1 ttl=117 time=19.8 ms
64 bytes from mad08s04-in-f14.1e100.net (172.217.16.238): icmp_seq=2 ttl=117 time=16.9 ms
64 bytes from mad08s04-in-f14.1e100.net (172.217.16.238): icmp_seq=3 ttl=117 time=14.1 ms
64 bytes from mad08s04-in-f14.1e100.net (172.217.16.238): icmp_seq=4 ttl=117 time=13.9 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3008ms
rtt min/avg/max/mdev = 13.853/16.163/19.835/2.436 ms
ernest@ubs24:~$
```

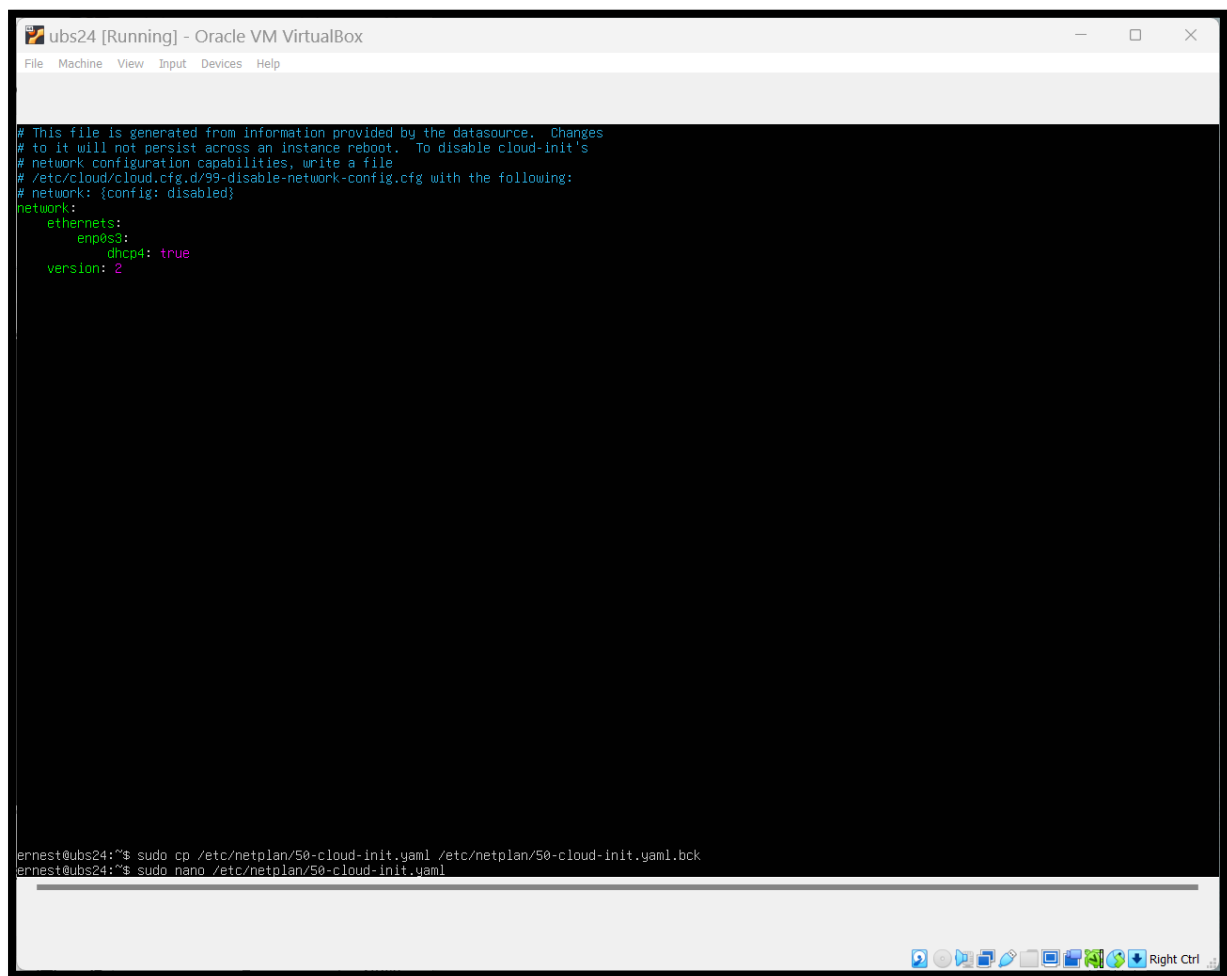
We can also ping google to check internet connectivity and it is connected to the internet.

```
GNU nano 7.2 /etc/netplan/50-cloud-init.yaml
# This file is generated from information provided by the datasource.  Changes
# to it will not persist across an instance reboot.  To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernets:
    enp0s3:
      dhcp4: true
      version: 2
```

```
GNU nano 7.2 /etc/netplan/50-cloud-init.yaml *
# This file is generated from information provided by the datasource.  Changes
# to it will not persist across an instance reboot.  To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernets:
    enp0s3:
      dhcp4: true
      version: 2

ernest@ubs24:~$ sudo cp /etc/netplan/50-cloud-init.yaml /etc/netplan/50-cloud-init.yaml.bck
```

Now make sure to create a backup of these files.



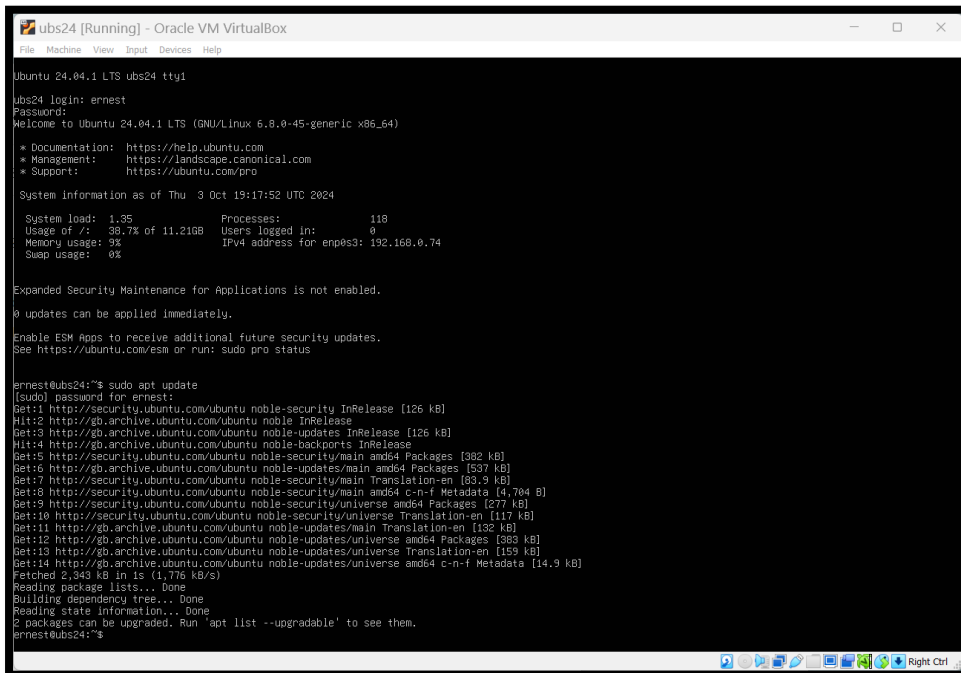
The screenshot shows a terminal window titled "ubs24 [Running] - Oracle VM VirtualBox". The terminal displays the contents of a network configuration file, followed by two commands and their outputs.

```
# This file is generated from information provided by the datasource. Changes
# to it will not persist across an instance reboot. To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
  ethernet:
    enp0s3:
      dhcp4: true
  version: 2

ernest@ubs24:~$ sudo cp /etc/netplan/50-cloud-init.yaml /etc/netplan/50-cloud-init.yaml.bck
ernest@ubs24:~$ sudo nano /etc/netplan/50-cloud-init.yaml
```

Go back into that nano file. To change this into a static file to do this remove the dhcp4: true line.

LAMP STACK Web server



```
Ubuntu 24.04.1 LTS ubs24 tty1
ubs24 login: ernest
Password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-45-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Thu  3 Oct 19:17:52 UTC 2024

System load:  1.35   Processes:           118
Usage of /:   30.7% of 11.21GB   Users logged in:       0
Memory usage: 9%    IPv4 address for enp8s3: 192.168.0.74
Swap usage:   0%

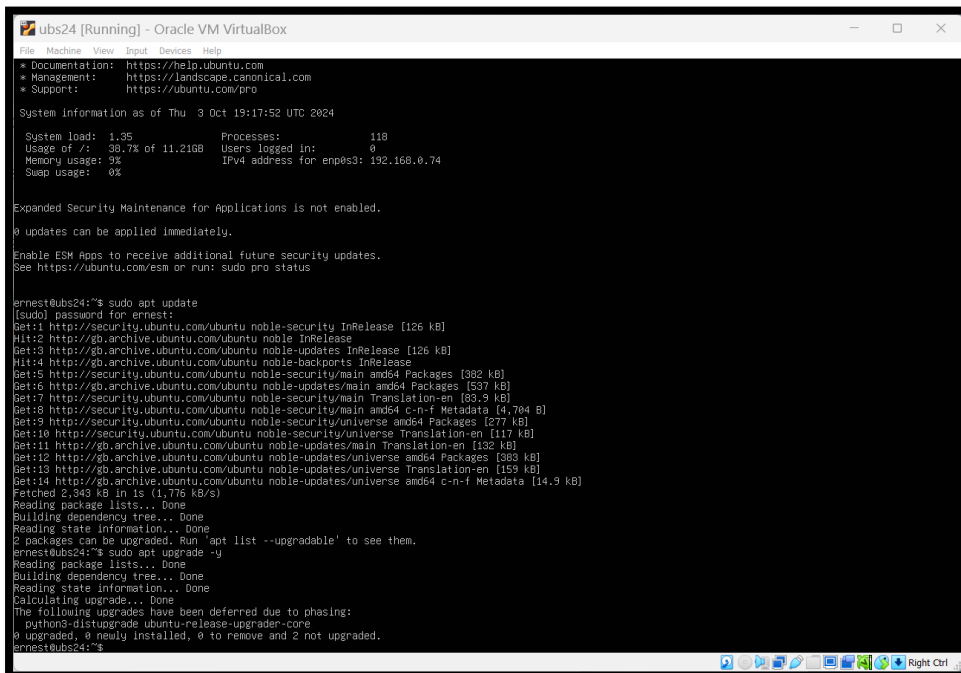
Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

ernest@ubs24:~$ sudo apt update
[sudo] password for ernest:
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:2 http://gb.archive.ubuntu.com/ubuntu noble InRelease
Get:3 http://gb.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:4 http://gb.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [382 kB]
Get:6 http://gb.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [537 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [83.9 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [4,704 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [277 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [117 kB]
Get:11 http://gb.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [132 kB]
Get:12 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [383 kB]
Get:13 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [159 kB]
Get:14 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [14.9 kB]
Fetched 2,343 kB in 1s (1,776 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
ernest@ubs24:~$
```

First update the server, use `sudo apt update`.



```
Ubuntu 24.04.1 LTS ubs24 tty1
ubs24 login: ernest
Password:
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-45-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Thu  3 Oct 19:17:52 UTC 2024

System load:  1.35   Processes:           118
Usage of /:   30.7% of 11.21GB   Users logged in:       0
Memory usage: 9%    IPv4 address for enp8s3: 192.168.0.74
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

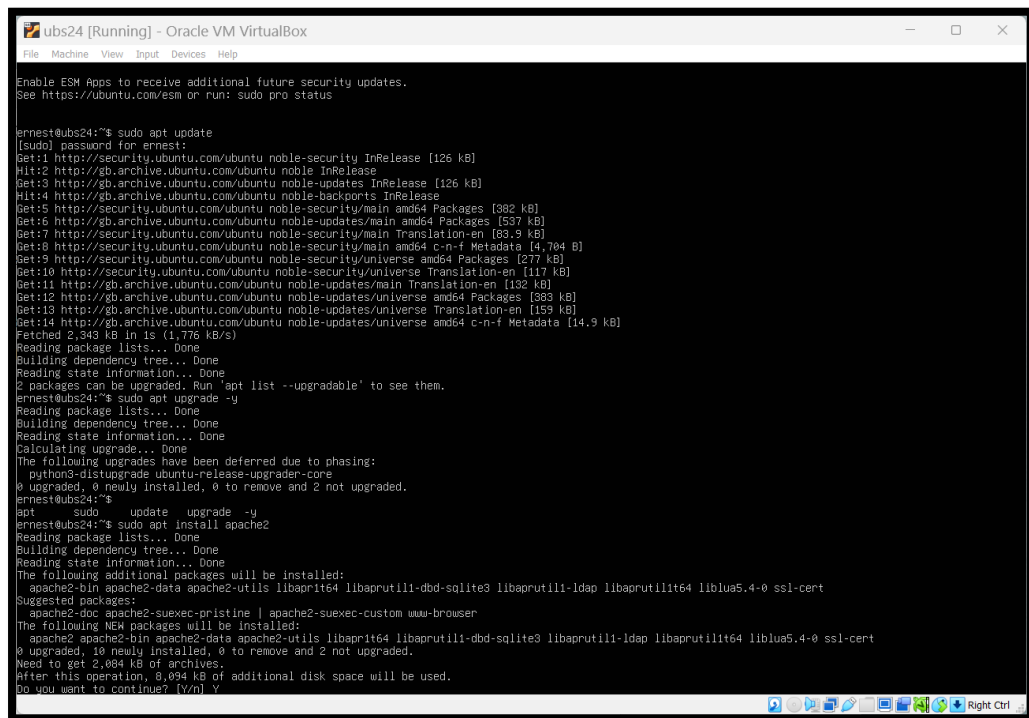
0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

ernest@ubs24:~$ sudo apt update
[sudo] password for ernest:
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:2 http://gb.archive.ubuntu.com/ubuntu noble InRelease
Get:3 http://gb.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:4 http://gb.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [382 kB]
Get:6 http://gb.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [537 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [83.9 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [4,704 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [277 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [117 kB]
Get:11 http://gb.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [132 kB]
Get:12 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [383 kB]
Get:13 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [159 kB]
Get:14 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [14.9 kB]
Fetched 2,343 kB in 1s (1,776 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
ernest@ubs24:~$ sudo apt upgrade -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following upgrades have been deferred due to phasing:
  python3-distupgrade ubuntu-release-upgrader-core
0 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
ernest@ubs24:~$
```

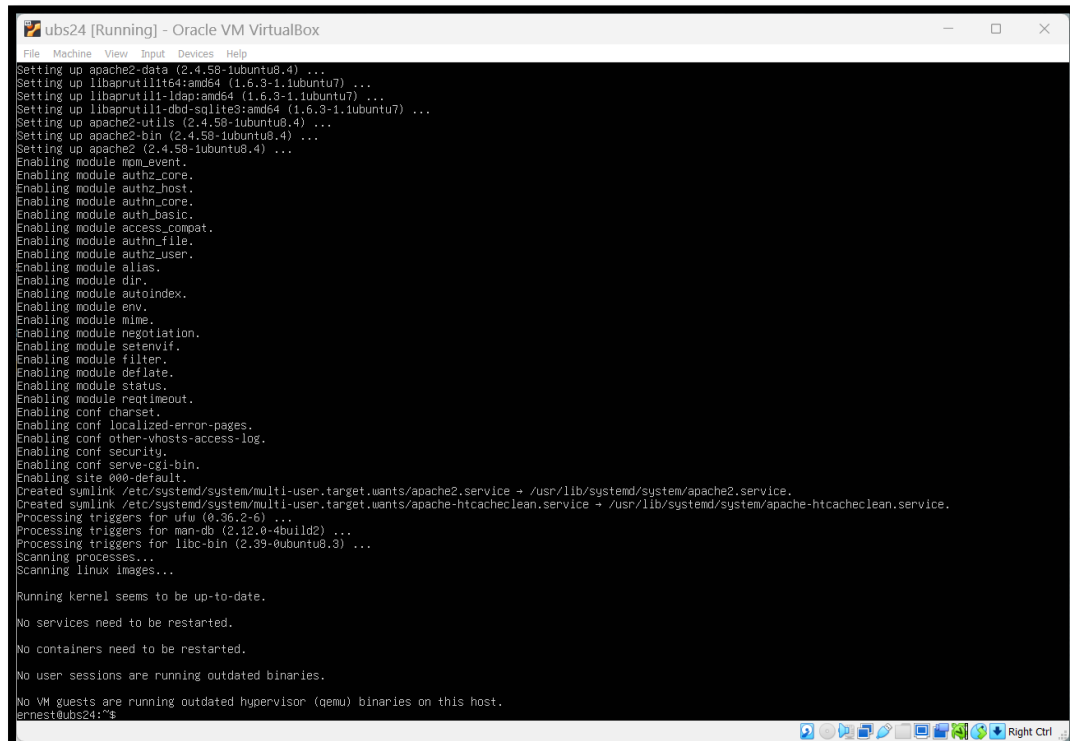
Now to install update use `sudo apt upgrade -y` the `-y` is to say yes because it will ask are you sure you want to install this on your hardware. Also, a warning of how much space these new packages these new updates will take. Always update before installing any new software to the system. This is the first step installing Linux and updating it.

Apache



```
ernest@ubs24:~$ sudo apt update
[sudo] password for ernest:
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:2 http://gb.archive.ubuntu.com/ubuntu noble InRelease [126 kB]
Get:3 http://gb.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:4 http://gb.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [382 kB]
Get:6 http://gb.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [537 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [83.9 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [4,704 B]
Get:9 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [277 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [117 kB]
Get:11 http://gb.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [132 kB]
Get:12 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [383 kB]
Get:13 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [159 kB]
Get:14 http://gb.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [14.9 kB]
Fetched 2,343 kB in 1s (1,776 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
ernest@ubs24:~$ sudo apt upgrade -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following upgrades have been deferred due to phasing:
  python3-distupgrade ubuntu-release-upgrader-core
0 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
ernest@ubs24:~$
apt sudo update upgrade -y
ernest@ubs24:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert
0 upgraded, 10 newly installed, 0 to remove and 2 not upgraded.
Need to get 2,484 kB of archives.
After this operation, 8,694 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

Apache software is what serves our web pages. In the last command -y was used to stop the question do you want to continue? [Y/n] type Y.



```
Setting up apache2-data (2.4.58-1ubuntu8.4) ...
Setting up libaprutil1t64:amd64 (1.6.3-1.1ubuntu7) ...
Setting up libaprutil1-ldap:amd64 (1.6.3-1.1ubuntu7) ...
Setting up libaprutil1-dbd-sqlite3:amd64 (1.6.3-1.1ubuntu7) ...
Setting up apache2-utils (2.4.58-1ubuntu8.4) ...
Setting up apache2-bin (2.4.58-1ubuntu8.4) ...
Setting up apache2 (2.4.58-1ubuntu8.4) ...
Enabling module mpm_event.
Enabling module mpm_core.
Enabling module authz_host.
Enabling module authn_core.
Enabling module auth_basic.
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 → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubs24:~$
```

Apache2 is installed.

```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
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 → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

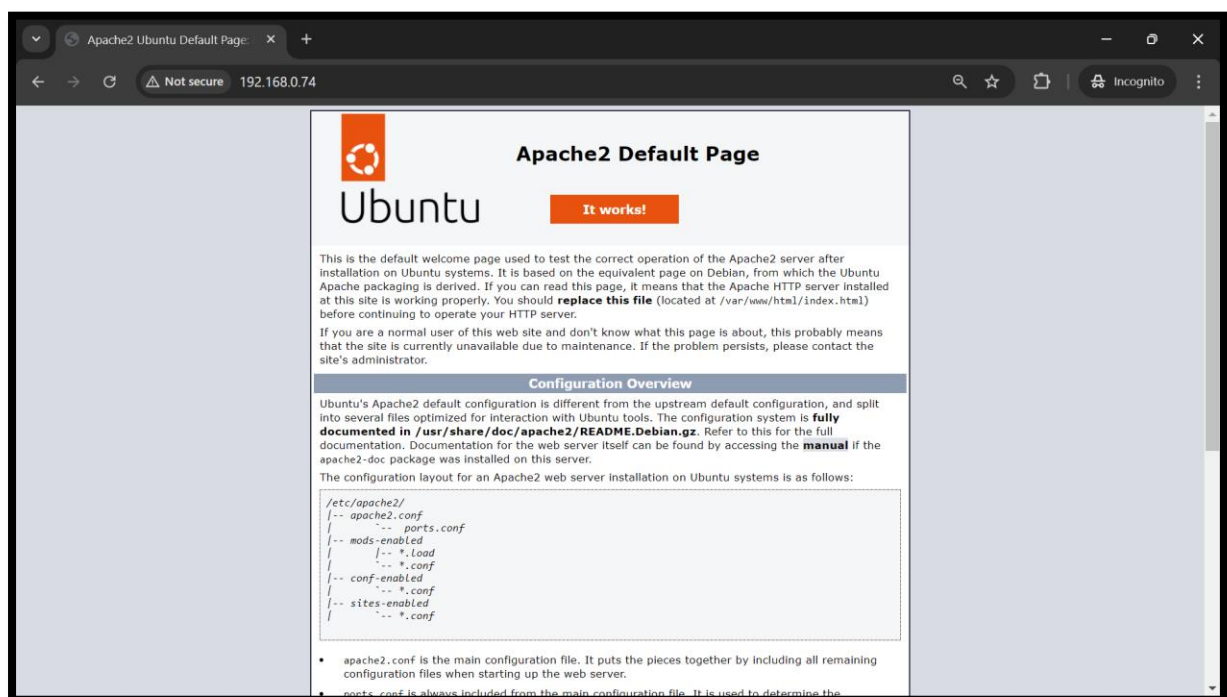
No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubs24:~$ sudo systemctl status apache
Unit apache.service could not be found.
ernest@ubs24:~$ sudo systemctl status apache2.service
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Thu 2024-10-03 19:38:17 UTC; 4min 1s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2084 (apache2)
    Tasks: 55 (limit: 2276)
   Memory: 5.4M (peak: 5.8M)
      CPU: 78ms
   CGroup: /system.slice/apache2.service
           └─2084 /usr/sbin/apache2 -k start
             └─2087 /usr/sbin/apache2 -k start
               └─2089 /usr/sbin/apache2 -k start

Oct 03 19:38:17 ubs24 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Oct 03 19:38:17 ubs24 apache2[2079]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive explicitly to avoid this warning.
Oct 03 19:38:17 ubs24 systemd[1]: Started apache2.service - The Apache HTTP Server.
lines 1-16/16 (END)
```

You can check the status of Apache by typing this command of `sudo systemctl status apache2.service`. This shows the Apache HTTP Server and it's enabled. Press q to esc out of that.



Another way to check that the Apache server is working is by using the IP address in the browser that is connect to it 192.168.0.74. It is showing the Apache2 webpage, so this is working.

```
Ubuntu24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
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 → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu0.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubuntu24:~$ sudo systemctl status apache
Unit apache.service could not be found.
ernest@ubuntu24:~$ sudo systemctl status apache2.service
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Thu 2024-10-03 19:38:17 UTC; 4min 1s ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 2084 (apache2)
      Tasks: 55 (limit: 2276)
     Memory: 5.4M (peak: 5.8M)
        CPU: 78ms
    CGroup: /system.slice/apache2.service
            └─2084 /usr/sbin/apache2 -k start
              └─2087 /usr/sbin/apache2 -k start
                └─2089 /usr/sbin/apache2 -k start

Oct 03 19:38:17 ubuntu24 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Oct 03 19:38:17 ubuntu24 apache2[2079]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive dynamically to determine the server's name.
Oct 03 19:38:17 ubuntu24 systemd[1]: Started apache2.service - The Apache HTTP Server.
ernest@ubuntu24:~$ sudo ufw status
Status: inactive
ernest@ubuntu24:~$ sudo ufw app list
Available applications:
  Apache
  Apache Full
  Apache Secure
  OpenSSH
ernest@ubuntu24:~$
```

The command of `sudo ufw status` shows if my firewall is active or inactive my is inactive. The command of `sudo ufw app list` will list out any profiles we have available on the system.

MySQL

```
Ubuntu24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
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 → /usr/lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /usr/lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36.2-6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu0.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubuntu24:~$ sudo systemctl status apache
Unit apache.service could not be found.
ernest@ubuntu24:~$ sudo systemctl status apache2.service
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Thu 2024-10-03 19:38:17 UTC; 4min 1s ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 2084 (apache2)
      Tasks: 55 (limit: 2276)
     Memory: 5.4M (peak: 5.8M)
        CPU: 78ms
    CGroup: /system.slice/apache2.service
            └─2084 /usr/sbin/apache2 -k start
              └─2087 /usr/sbin/apache2 -k start
                └─2089 /usr/sbin/apache2 -k start

Oct 03 19:38:17 ubuntu24 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Oct 03 19:38:17 ubuntu24 apache2[2079]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive dynamically to determine the server's name.
Oct 03 19:38:17 ubuntu24 systemd[1]: Started apache2.service - The Apache HTTP Server.
ernest@ubuntu24:~$ sudo ufw status
Status: inactive
ernest@ubuntu24:~$ sudo ufw app list
Available applications:
  Apache
  Apache Full
  Apache Secure
  OpenSSH
ernest@ubuntu24:~$ sudo apt install mysql-server -y
```



```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
reading /usr/share/mecab/dic/ipadic/Noun.others.csv ... 151
reading /usr/share/mecab/dic/ipadic/Noun.proper.csv ... 27328
reading /usr/share/mecab/dic/ipadic/Noun.org.csv ... 16668
reading /usr/share/mecab/dic/ipadic/Noun.place.csv ... 72999
reading /usr/share/mecab/dic/ipadic/Noun.nai.csv ... 42
reading /usr/share/mecab/dic/ipadic/Suffix.csv ... 1393
reading /usr/share/mecab/dic/ipadic/Conjunction.csv ... 171
reading /usr/share/mecab/dic/ipadic/Noun.adjv.csv ... 3328
reading /usr/share/mecab/dic/ipadic/Noun.number.csv ... 42
reading /usr/share/mecab/dic/ipadic/Noun.verbal.csv ... 12146
reading /usr/share/mecab/dic/ipadic/Verb.csv ... 139750
reading /usr/share/mecab/dic/ipadic/Adj.csv ... 27218
reading /usr/share/mecab/dic/ipadic/Interjection.csv ... 252
reading /usr/share/mecab/dic/ipadic/Noun.demonst.csv ... 120
reading /usr/share/mecab/dic/ipadic/Noun.name.csv ... 34202
reading /usr/share/mecab/dic/ipadic/Advverb.csv ... 3032
reading /usr/share/mecab/dic/ipadic/Others.csv ... 2
reading /usr/share/mecab/dic/ipadic/Auxil.csv ... 199
reading /usr/share/mecab/dic/ipadic/Postp.csv ... 146
reading /usr/share/mecab/dic/ipadic/Noun.adverbial.csv ... 795
reading /usr/share/mecab/dic/ipadic/Adnominal.csv ... 135
reading /usr/share/mecab/dic/ipadic/Filler.csv ... 19
reading /usr/share/mecab/dic/ipadic/Postp-col.csv ... 91
emitting double-array: 100% [#####]
reading /usr/share/mecab/dic/ipadic/matrix.def ... 1316x1316
emitting matrix : 100% [#####]

done!
update-alternatives: using /var/lib/mecab/dic/ipadic-utf8 to provide /var/lib/mecab/dic/debian (mecab-dictionary) in auto mode
Setting up libhtml-parser-perl:amd64 (3.81-1build3) ...
Setting up libhttp-message-perl (6.45-1ubuntu1) ...
Setting up mysql-server (8.0.39-0ubuntu0.24.04.2) ...
Setting up libcgi-pm-perl (4.63-1) ...
Setting up libhtml-template-perl (2.97-2) ...
Setting up libcgi-fast-perl (1:2.17-1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu0.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubs24:~$
```

MySQL will be installed and used as the database for this web server. Type in `sudo apt install mysql-server -y`.

```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
reading /usr/share/mecab/dic/ipadic/Advverb.csv ... 3032
reading /usr/share/mecab/dic/ipadic/Others.csv ... 2
reading /usr/share/mecab/dic/ipadic/Auxil.csv ... 199
reading /usr/share/mecab/dic/ipadic/Postp.csv ... 146
reading /usr/share/mecab/dic/ipadic/Noun.adverbial.csv ... 795
reading /usr/share/mecab/dic/ipadic/Adnominal.csv ... 135
reading /usr/share/mecab/dic/ipadic/Filler.csv ... 19
reading /usr/share/mecab/dic/ipadic/Postp-col.csv ... 91
emitting double-array: 100% [#####]
reading /usr/share/mecab/dic/ipadic/matrix.def ... 1316x1316
emitting matrix : 100% [#####]

done!
update-alternatives: using /var/lib/mecab/dic/ipadic-utf8 to provide /var/lib/mecab/dic/debian (mecab-dictionary) in auto mode
Setting up libhtml-parser-perl:amd64 (3.81-1build3) ...
Setting up libhttp-message-perl (6.45-1ubuntu1) ...
Setting up mysql-server (8.0.39-0ubuntu0.24.04.2) ...
Setting up libcgi-pm-perl (4.63-1) ...
Setting up libhtml-template-perl (2.97-2) ...
Setting up libcgi-fast-perl (1:2.17-1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu0.3) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

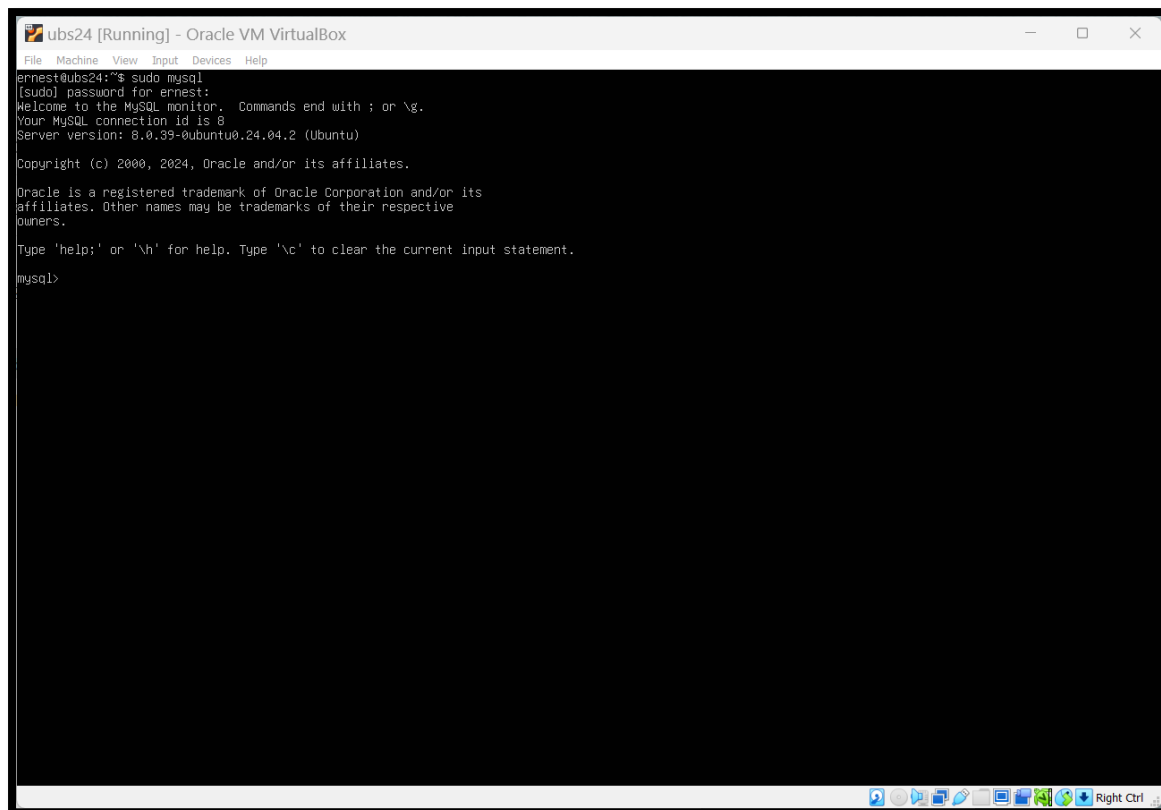
No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubs24:~$ sudo systemctl status mysql.service
mysql.service - MySQL Community Server
   Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: enabled)
   Active: active (running) since Thu 2024-10-03 20:04:05 UTC; 3min 41s ago
     Process: 3075 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
    Main PID: 3084 (mysqld)
      Status: "Server is operational"
        Tasks: 37 (limit: 2276)
      Memory: 365.3M (peak: 379.5M)
         CPU: 4.370s
        CGroup: /system.slice/mysql.service
                └─3084 /usr/sbin/mysqld

Oct 03 20:04:04 ubs24 systemd[1]: Starting mysql.service - MySQL Community Server...
Oct 03 20:04:05 ubs24 systemd[1]: Started mysql.service - MySQL Community Server.
ernest@ubs24:~$
```

Now to check the services of MySQL type `sudo systemctl status mysql.service`. You can see it's active, enabled and running press q to exit. In case it's not running it should be but should type `sudo systemctl start apache2.service` or the same with `mysql.service` to get it to start if need be.



```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubs24:~$ sudo mysql
[sudo] password for ernest:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.39-0ubuntu0.24.04.2 (Ubuntu)

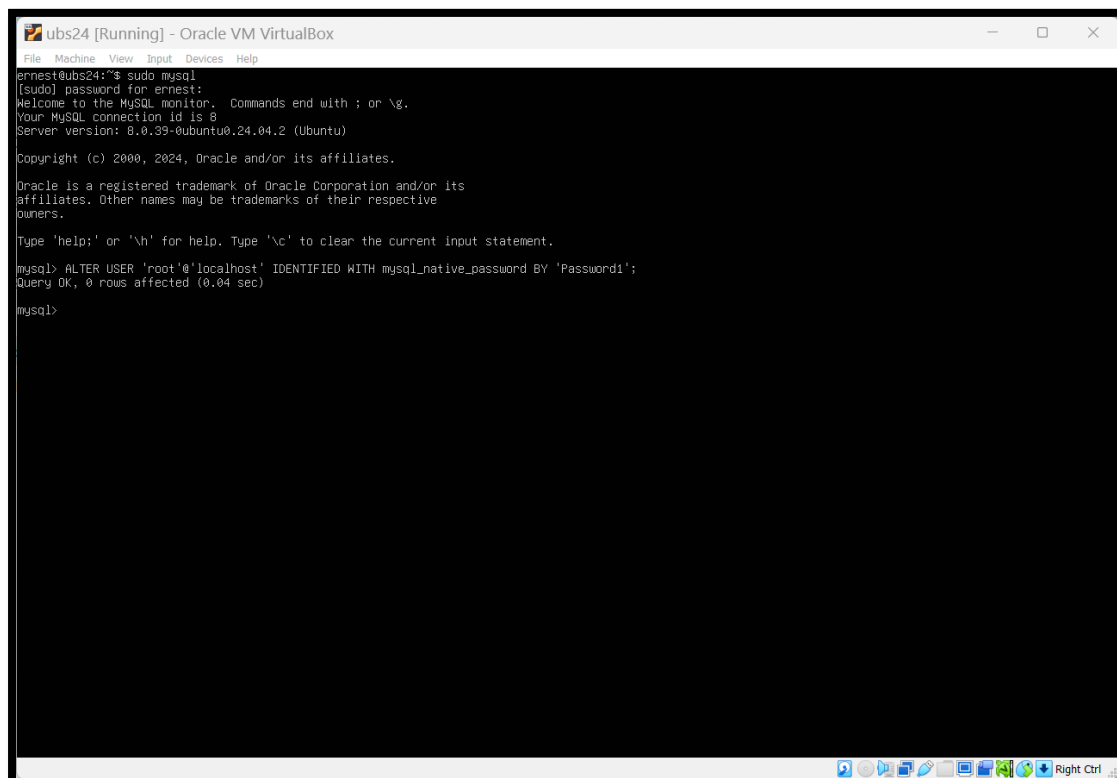
Copyright (c) 2000, 2024, Oracle and/or its affiliates.

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>
```

First log into MySQL data management system type `sudo mysql` type in password. The MySQL version I'm using is 8.0.39.



```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubs24:~$ sudo mysql
[sudo] password for ernest:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.39-0ubuntu0.24.04.2 (Ubuntu)

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

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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 statement.

mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'Password1';
Query OK, 0 rows affected (0.04 sec)

mysql>
```

Now to set our root account password on MySQL, type `ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'Password1';`

```
Ubuntu24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubuntu24:~$ sudo mysql
[sudo] password for ernest:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.39-0ubuntu0.24.04.2 (Ubuntu)

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

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 WITH mysql_native_password BY 'Password1';
Query OK, 0 rows affected (0.04 sec)

mysql> exit
Bye
ernest@ubuntu24:~$
```

Now to exit. Now to set up our final configuration of MySQL is to run the secure installation script that's built into MySQL.

```
Ubuntu24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubuntu24:~$ sudo mysql_secure_installation
[sudo] password for ernest:

Securing the MySQL server deployment.

Enter password for user root:

VALIDATE PASSWORD COMPONENT can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD component?

Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG Length >= 8, numeric, mixed case, special characters and dictionary file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: _
```

This to setup the validate password components this next question and it basically allows you to check to make sure the password strength is good for your security policy. It's good to set one of these up you can use lowercase y or capital Y for yes. You have three different settings for the password policy and it's the length mixed with characters.

```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubs24:~$ sudo mysql_secure_installation
[sudo] password for ernest:

Securing the MySQL server deployment.

Enter password for user root:

VALIDATE PASSWORD COMPONENT can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD component?

Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG Length >= 8, numeric, mixed case, special characters and dictionary      file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 0
Using existing password for root.

Estimated strength of the password: 50
Change the password for root ? ((Press y|Y for Yes, any other key for No) : No

... skipping.
By default, a MySQL installation has an anonymous user,
allowing anyone to log into MySQL without having to have
a user account created for them. This is intended only for
testing, and to make the installation go a bit smoother.
You should remove them before moving into a production
environment.

Remove anonymous users? (Press y|Y for Yes, any other key for No) : y
```

I will set it to low and I'm not going to change the root password. The next part is where it actually secures the server. You can remove anonymous users not allowing anyone to log into the server say yes.

```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
ernest@ubs24:~$ sudo mysql_secure_installation
[sudo] password for ernest:

Securing the MySQL server deployment.

Enter password for user root:

VALIDATE PASSWORD COMPONENT can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD component?

Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG Length >= 8, numeric, mixed case, special characters and dictionary      file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 0
Using existing password for root.

Estimated strength of the password: 50
Change the password for root ? ((Press y|Y for Yes, any other key for No) : No

... skipping.
By default, a MySQL installation has an anonymous user,
allowing anyone to log into MySQL without having to have
a user account created for them. This is intended only for
testing, and to make the installation go a bit smoother.
You should remove them before moving into a production
environment.

Remove anonymous users? (Press y|Y for Yes, any other key for No) : y
Success.

Normally, root should only be allowed to connect from
'localhost'. This ensures that someone cannot guess at
the root password from the network.

Disallow root login remotely? (Press y|Y for Yes, any other key for No) : y_
```

We don't want anyone login remotely so y: yes to disallow root login remotely.

```
ubs24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

LOW Length >= 8
MEDIUM Length >= 8, numeric, mixed case, and special characters
STRONG Length >= 8, numeric, mixed case, special characters and dictionary file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 0
Using existing password for root.

Estimated strength of the password: 50
Change the password for root? ((Press y|Y for Yes, any other key for No) : No

... skipping.
By default, a MySQL installation has an anonymous user,
allowing anyone to log into MySQL without having to have
a user account created for them. This is intended only for
testing, and to make the installation go a bit smoother.
You should remove them before moving into a production
environment.

Remove anonymous users? (Press y|Y for Yes, any other key for No) : y
Success.

Normally, root should only be allowed to connect from
'localhost'. This ensures that someone cannot guess at
the root password from the network.

Disallow root login remotely? (Press y|Y for Yes, any other key for No) : y
Success.

By default, MySQL comes with a database named 'test' that
anyone can access. This is also intended only for testing,
and should be removed before moving into a production
environment.

Remove test database and access to it? (Press y|Y for Yes, any other key for No) : y
- Dropping test database...
Success.

- Removing privileges on test database...
Success.

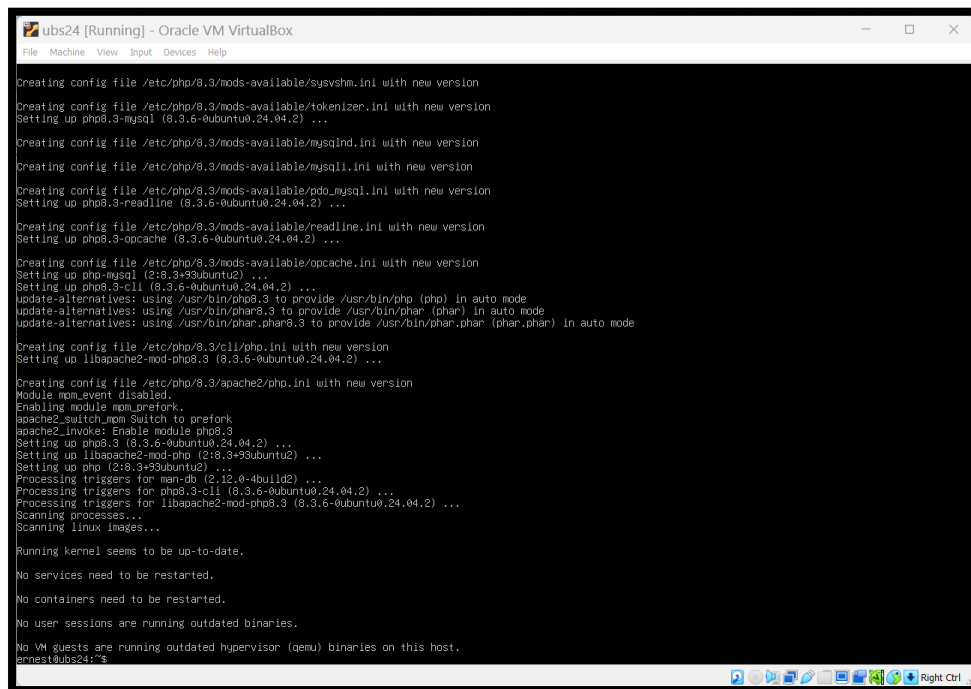
Reloading the privilege tables will ensure that all changes
made so far will take effect immediately.

Reload privilege tables now? (Press y|Y for Yes, any other key for No) : y
Success.

All done!
ernest@ubs24:~$
```

Remove test databases yes and this will reload privilege tables this just resets everything for us. Now the MySQL server is secure as much as possible but you can add extra security.

The last step is PHP



```
ubunt24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Creating config file /etc/php/8.3/mods-available/sysvshm.ini with new version
Creating config file /etc/php/8.3/mods-available/tokenizer.ini with new version
Setting up php8.3-mysql (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/mods-available/mysqlnd.ini with new version
Creating config file /etc/php/8.3/mods-available/mysqli.ini with new version
Creating config file /etc/php/8.3/mods-available/pdo_mysql.ini with new version
Setting up php8.3-readline (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/mods-available/readline.ini with new version
Setting up php8.3-opcache (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/mods-available/opcache.ini with new version
Setting up php-mysql (2:8.3+93ubuntu2) ...
Setting up php8.3-curl (8.3.6-0ubuntu0.24.04.2) ...
update-alternatives: using /usr/bin/php8.3 to provide /usr/bin/php (php) in auto mode
update-alternatives: using /usr/bin/phar8.3 to provide /usr/bin/phar (phar) in auto mode
update-alternatives: using /usr/bin/phar.phar8.3 to provide /usr/bin/phar.phar (phar.phar) in auto mode
Creating config file /etc/php/8.3/cli/php.ini with new version
Setting up libapache2-mod-php8.3 (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/apache2/php.ini with new version
Module mpm_event disabled.
Enabling module mpm_prefork.
apache2_switch_mpm Switch to prefork
apache2_invoke: Enable module php8.3
Setting up php8.3 (8.3.6-0ubuntu0.24.04.2) ...
Setting up libapache2-mod-php (2:8.3+93ubuntu2) ...
Setting up php (2:8.3+93ubuntu2) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for php8.3-curl (8.3.6-0ubuntu0.24.04.2) ...
Processing triggers for libapache2-mod-php8.3 (8.3.6-0ubuntu0.24.04.2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

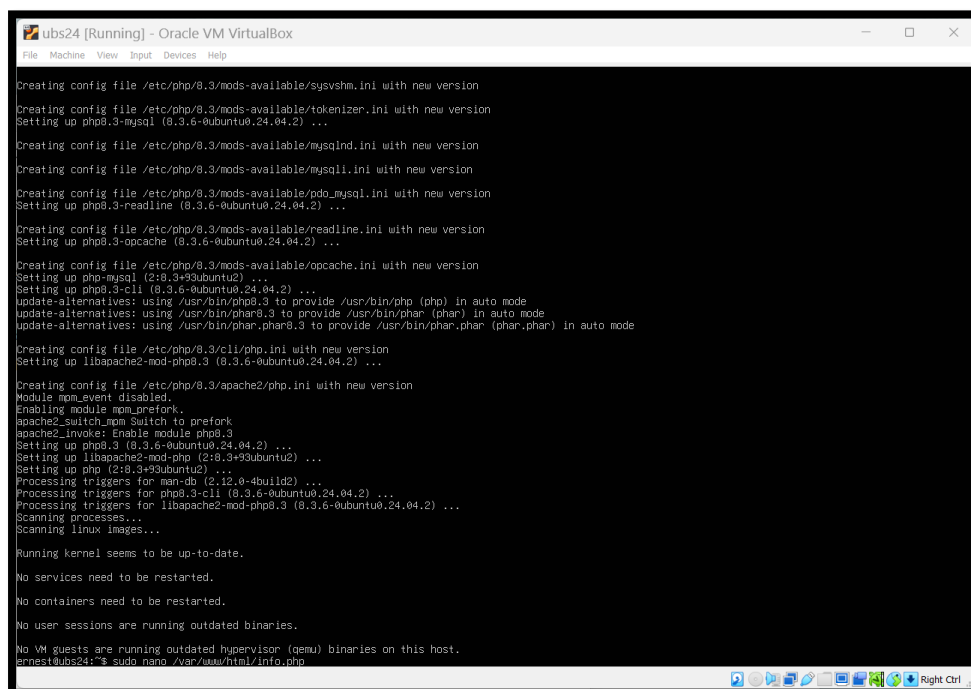
No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubunt24:~$
```

Now to install three main packages type `sudo apt install php libapache2-mod-php php-mysql -y`.



```
ubunt24 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

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Creating config file /etc/php/8.3/mods-available/tokenizer.ini with new version
Setting up php8.3-mysql (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/mods-available/mysqlnd.ini with new version
Creating config file /etc/php/8.3/mods-available/mysqli.ini with new version
Creating config file /etc/php/8.3/mods-available/pdo_mysql.ini with new version
Setting up php8.3-readline (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/mods-available/readline.ini with new version
Setting up php8.3-opcache (8.3.6-0ubuntu0.24.04.2) ...
Creating config file /etc/php/8.3/mods-available/opcache.ini with new version
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update-alternatives: using /usr/bin/phar.phar8.3 to provide /usr/bin/phar.phar (phar.phar) in auto mode
Creating config file /etc/php/8.3/cli/php.ini with new version
Setting up libapache2-mod-php8.3 (8.3.6-0ubuntu0.24.04.2) ...
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Processing triggers for man-db (2.12.0-4build2) ...
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Processing triggers for libapache2-mod-php8.3 (8.3.6-0ubuntu0.24.04.2) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

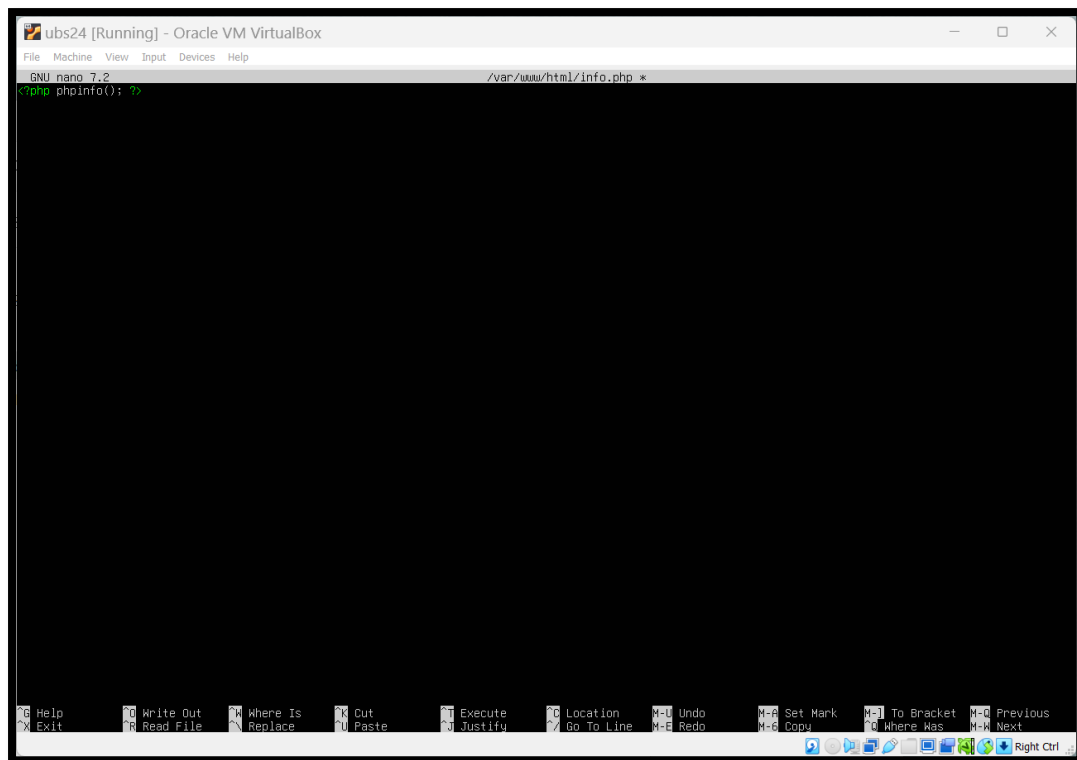
No services need to be restarted.

No containers need to be restarted.

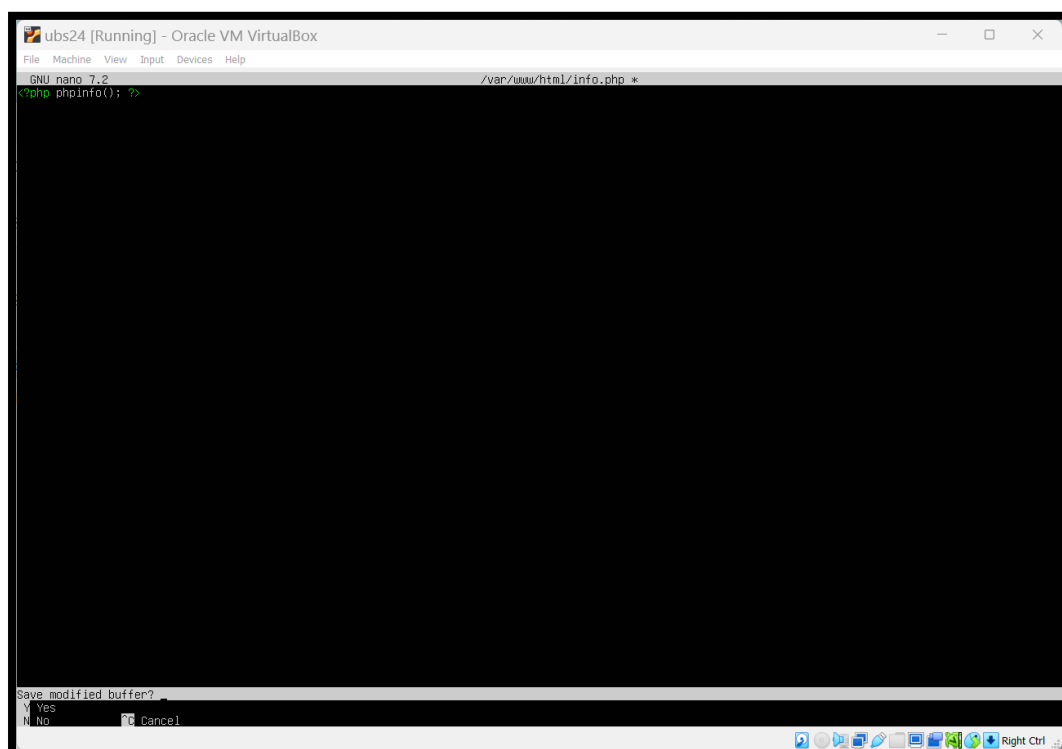
No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ernest@ubunt24:~$ sudo nano /var/www/html/info.php
```

Now to test out my server just to verify that my PHP is on the server and working properly. We can create a file quickly with Apache there is a default location for your web files it's under var, type `sudo nano /var/www/html/info.php`. The file I'll create is called `info.php` and using my text editor `nano`.



In the text editor type in this php line of code <?php phpinfo(); ?>.
To save type ctrl+x.



Y to save and exit.

| PHP Version 8.3.6 | |
|---|--|
| System | Linux ubuntu 6.8.0-45-generic #45-Ubuntu SMP PREEMPT_DYNAMIC Fri Aug 30 12:02:04 UTC 2024 x86_64 |
| Build Date | Sep 30 2024 15:17:17 |
| Build System | Linux |
| Server API | Apache 2.0 Handler |
| Virtual Directory Support | disabled |
| Configuration File (php.ini) Path | /etc/php/8.3/apache2 |
| Loaded Configuration File | /etc/php/8.3/apache2/php.ini |
| Scan this dir for additional .ini files | /etc/php/8.3/apache2/conf.d |
| Additional .ini files parsed | /etc/php/8.3/apache2/conf.d/10-mysqlnd.ini, /etc/php/8.3/apache2/conf.d/10-opcache.ini, /etc/php/8.3/apache2/conf.d/10-pdo.ini, /etc/php/8.3/apache2/conf.d/20-calendar.ini, /etc/php/8.3/apache2/conf.d/20-ctype.ini, /etc/php/8.3/apache2/conf.d/20-exif.ini, /etc/php/8.3/apache2/conf.d/20-ftp.ini, /etc/php/8.3/apache2/conf.d/20-headers.ini, /etc/php/8.3/apache2/conf.d/20-ldap.ini, /etc/php/8.3/apache2/conf.d/20-gettext.ini, /etc/php/8.3/apache2/conf.d/20-iconv.ini, /etc/php/8.3/apache2/conf.d/20-mysqli.ini, /etc/php/8.3/apache2/conf.d/20-pdo_mysql.ini, /etc/php/8.3/apache2/conf.d/20-phar.ini, /etc/php/8.3/apache2/conf.d/20-posix.ini, /etc/php/8.3/apache2/conf.d/20-readline.ini, /etc/php/8.3/apache2/conf.d/20-shmop.ini, /etc/php/8.3/apache2/conf.d/20-sockets.ini, /etc/php/8.3/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.3/apache2/conf.d/20-sysvsem.ini, /etc/php/8.3/apache2/conf.d/20-sysvshm.ini, /etc/php/8.3/apache2/conf.d/20-tokenizer.ini |
| PHP API | 20230831 |
| PHP Extension | 20230831 |
| Zend Extension | 420230831 |
| Zend Extension Build | API420230831.NTS |
| PHP Extension Build | API20230831.NTS |
| Debug Build | no |
| Thread Safety | disabled |
| Zend Signal Handling | enabled |
| Zend Memory Manager | enabled |
| Zend Multibyte Support | disabled |
| Zend Max Execution Timers | disabled |
| IPv6 Support | enabled |
| DTrace Support | disabled |
| Registered PHP Streams | tcp, ftps, compress.zlib, php, file, glob, data, http, ftp, phar |
| Registered Stream Socket Transports | tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3 |
| Registered Stream Filters | zlib *, string.rot13, string.toupper, string.tolower, convert *, consumed, dechunk, convert.iconv.* |

Go to the webpage type next to the IP Address /info.php and the PHP version webpage shows up. This lets us know that PHP is enabled on the server and working properly.

PHP 8.3.6 - phpinfo()

Not secure 192.168.0.74/info.php

Incognito

Configuration

apache2handler

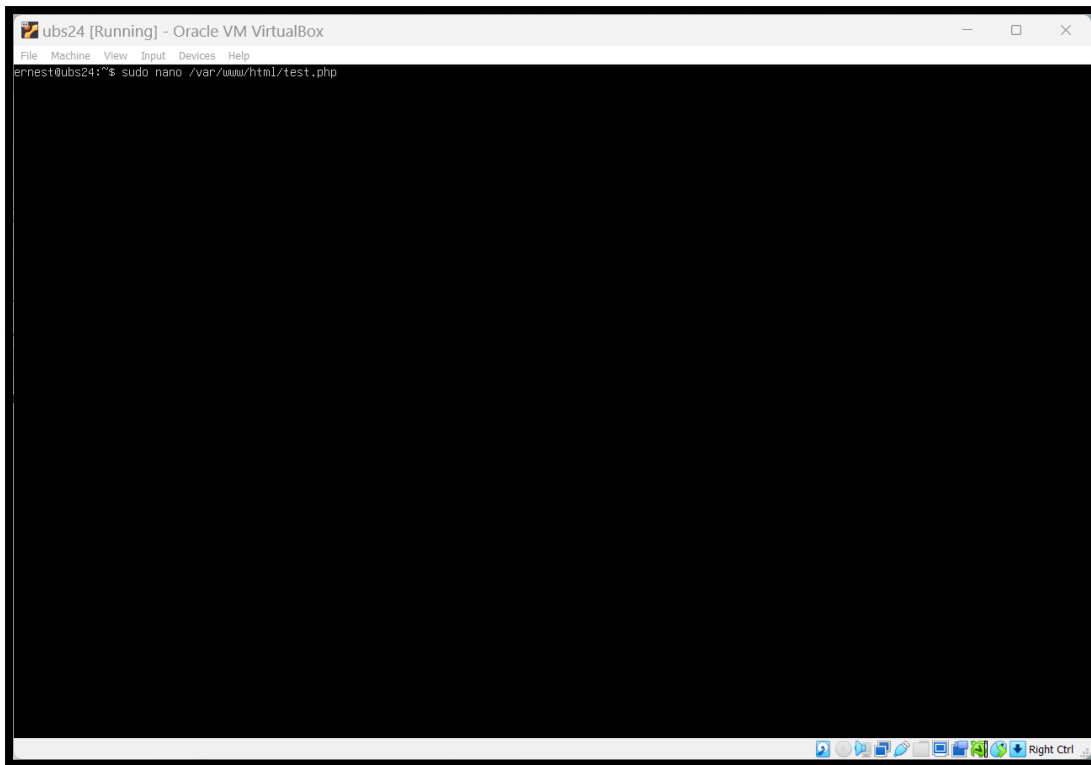
| | | |
|----------------------|--|--|
| Apache Version | Apache/2.4.58 (Ubuntu) | |
| Apache API Version | 20120211 | |
| Server Administrator | webmaster@localhost | |
| Hostname:Port | 127.0.1.1:80 | |
| User/Group | www-data:(33)/33 | |
| Max Requests | Per Child: 0 - Keep-Alive: on - Max Per Connection: 100 | |
| Timeouts | Connection: 300 - Keep-Alive: 5 | |
| Virtual Server | Yes | |
| Server Root | /etc/apache2 | |
| Loaded Modules | core mod_so mod_watchdog http_core mod_log_config mod_logio mod_version mod_unixd mod_access_compat mod_alias mod_auth_basic mod_auth_core mod_auth_file mod_authz_core mod_authz_host mod_authz_user mod_autoindex mod_deflate mod_dir mod_env mod_filter mod_mime prefork mod_negotiation mod_php mod_reqtimeout mod_setenvif mod_status | |

| Directive | Local Value | Master Value |
|---------------|-------------|--------------|
| engine | On | On |
| last_modified | Off | Off |
| xbithack | Off | Off |

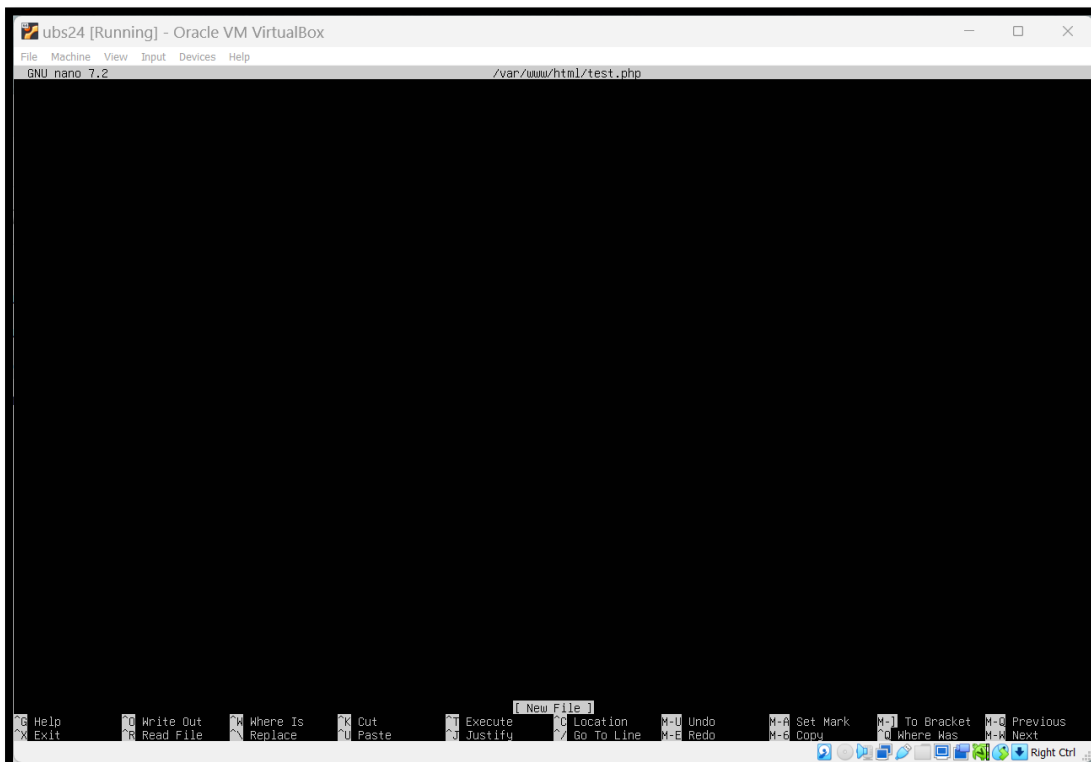
Apache Environment

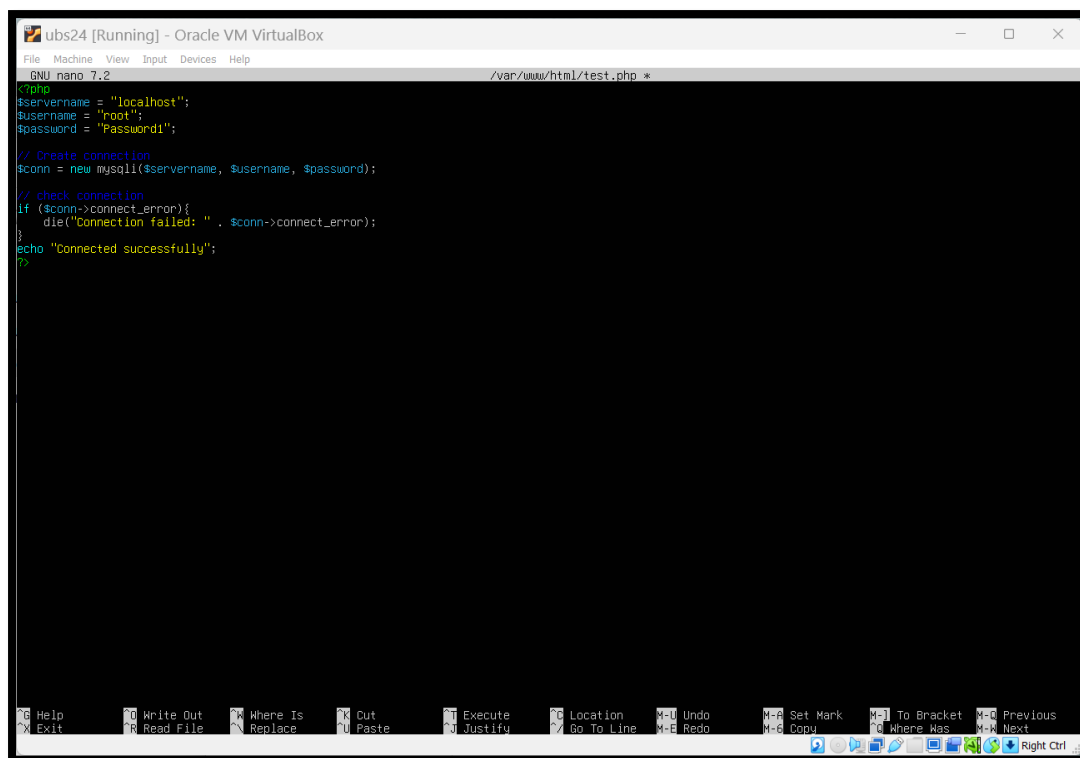
| Variable | Value |
|--------------------------------|---|
| HTTP_HOST | 192.168.0.74 |
| HTTP_CONNECTION | keep-alive |
| HTTP_UPGRADE_INSECURE_REQUESTS | 1 |
| HTTP_USER_AGENT | Mozilla/5.0 (Windows NT 10.0; Win64; x64; AppleWebKit/537.36 (KHTML, like Gecko) Chrome/129.0.0.0 Safari/537.36 |
| HTTP_ACCEPT | text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7 |
| HTTP_ACCEPT_ENCODING | gzip, deflate |
| HTTP_ACCEPT_LANGUAGE | en-GB,en;q=0.9 |
| PATH | /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin |
| SERVER_SIGNATURE | <address>Apache/2.4.58 (Ubuntu) Server at 192.168.0.74 Port 80</address> |
| SERVER_SOFTWARE | Apache/2.4.58 (Ubuntu) |

Shows configuration about Apache and it environment plus more information about the server.



I will create another test file and this will test to see if PHP can interact with MySQL. Now to create another file under our var www directory, type `sudo nano /var/www/html/test.php` and this will test MySQL essentially to just verify that everything works.





The screenshot shows a terminal window titled 'ubs24 [Running] - Oracle VM VirtualBox'. Inside, the nano 7.2 editor is open, editing the file '/var/www/html/test.php'. The code is as follows:

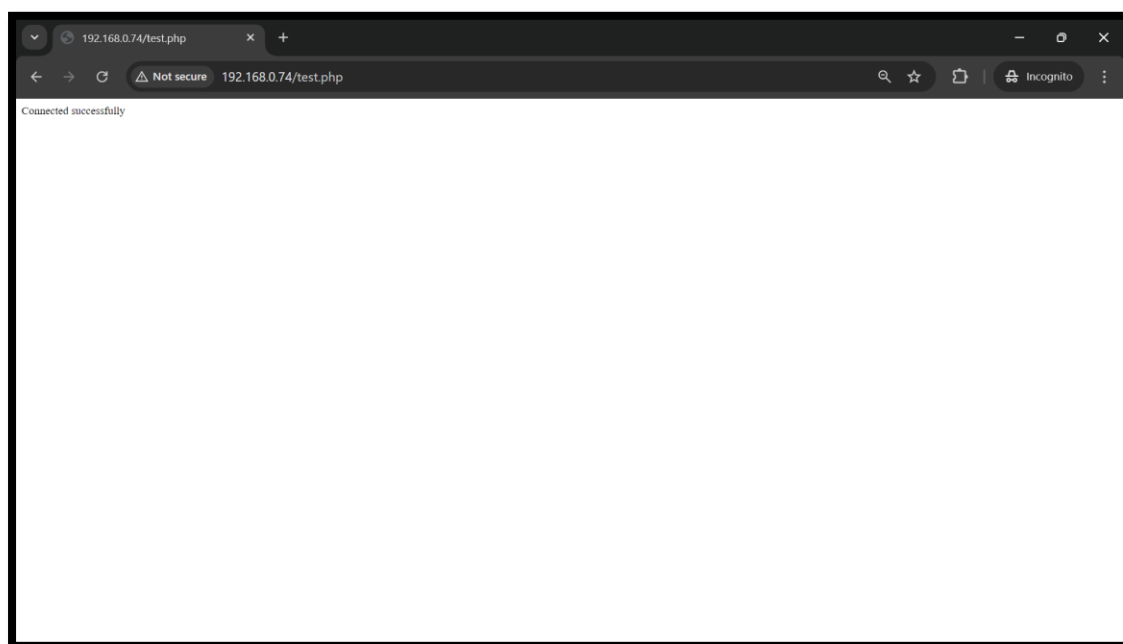
```
<?php
$servername = "localhost";
$username = "root";
$password = "Password1";

// Create connection
$conn = new mysqli($servername, $username, $password);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
echo "Connected successfully";
?>
```

The bottom of the window shows a menu bar with options like Help, Exit, Write Out, Read File, Where Is, Replace, Cut, Paste, Execute, Justify, Location, Go To Line, Undo, Redo, Set Mark, Copy, To Bracket, Where Was, Next, and Previous. A status bar at the very bottom shows icons for various applications and a 'Right Ctrl' indicator.

This script is to test out the connection at the top is setting some variables localhost, root account and our password that was set. Save this and test it.



It connected successfully to our MySQL server.