Name: ROALLOS, Jean Gabriel Vincent G.	**Date Performed:** 08 / 08 / 2025
Course/Section: CPE212 - CPE31S2	**Date Submitted:** 08 / 08 / 2025
Instructor: Engr. Robin Valenzuela	**Semester & SY:** 1st Sem, 2025 - 2026

Activity 1: Configure Network using Virtual Machines

1. **Objectives:**

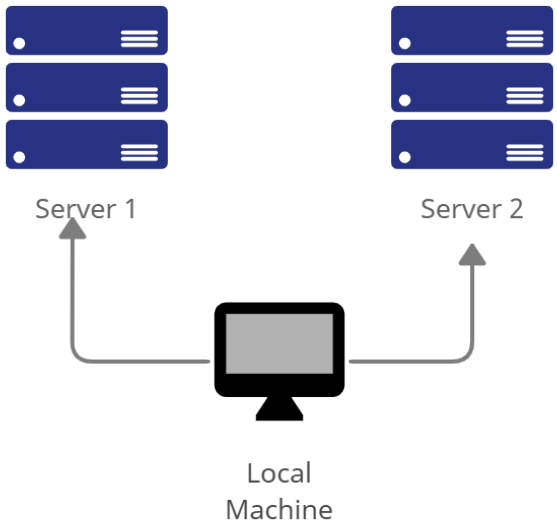
1.1. Create and configure Virtual Machines in Microsoft Azure or VirtualBox

1.2. Set-up a Virtual Network and Test Connectivity of VMs

2. **Discussion:**

Network Topology:

Assume that you have created the following network topology in Virtual Machines, *provide screenshots for each task*. (Note: *it is assumed that you have the prior knowledge of cloning and creating snapshots in a virtual machine*).



Task 1: Do the following on Server 1, Server 2, and Local Machine. In editing the file using nano command, press control + O to write out (save the file). Press enter when asked for the name of the file. Press control + X to end.

1. Change the hostname using the command *sudo nano /etc/hostname*
   1.1 Use server1 for Server 1
   1.2 Use server2 for Server 2
   1.3 Use workstation for the Local Machine
2. Edit the hosts using the command *sudo nano /etc/hosts*. Edit the second line.

2.1 Type 127.0.0.1 server 1 for Server 1
2.2 Type 127.0.0.1 server 2 for Server 2
2.3 Type 127.0.0.1 workstation for the Local Machine

Task 2: Configure SSH on Server 1, Server 2, and Local Machine. Do the following:

1. Upgrade the packages by issuing the command *sudo apt update* and *sudo apt upgrade* respectively.
2. Install the SSH server using the command *sudo apt install openssh-server*.
3. Verify if the SSH service has started by issuing the following commands:
   3.1 *sudo service ssh start*
   3.2 *sudo systemctl status ssh*
4. Configure the firewall to all port 22 by issuing the following commands:
   4.1 *sudo ufw allow ssh*
   4.2 *sudo ufw enable*
   4.3 *sudo ufw status*

Task 3: Verify network settings on Server 1, Server 2, and Local Machine. On each device, do the following:

1. Record the ip address of Server 1, Server 2, and Local Machine. Issue the command *ifconfig* and check network settings. Note that the ip addresses of all the machines are in this network 192.168.56.XX.
   1.1 Server 1 IP address: 192.168.56.**105**
   1.2 Server 2 IP address: 192.168.56.**106**
   1.3 Workstation IP address: 192.168.56.**104**
2. Make sure that they can ping each other.
   2.1 Connectivity test for Local Machine 1 to Server 1: ☐ Successful ☐ Not Successful
   2.2 Connectivity test for Local Machine 1 to Server 2: ☐ Successful ☐ Not Successful
   2.3 Connectivity test for Server 1 to Server 2: ☐ Successful ☐ Not Successful

Task 4: Verify SSH connectivity on Server 1, Server 2, and Local Machine.

1. On the Local Machine, issue the following commands:

1.1 ssh username@ip_address_server1 for example, *ssh jvtaylar@192.168.56.120*
1.2 Enter the password for server 1 when prompted
1.3 Verify that you are in server 1. The user should be in this format user@server1. For example, *jvtaylar@server1*

2. Logout of Server 1 by issuing the command *control + D.*
3. Do the same for Server 2.

4. Edit the hosts of the Local Machine by issuing the command *sudo nano /etc/hosts.* Below all texts type the following:

4.1 IP_address server 1 (provide the ip address of server 1 followed by the hostname)

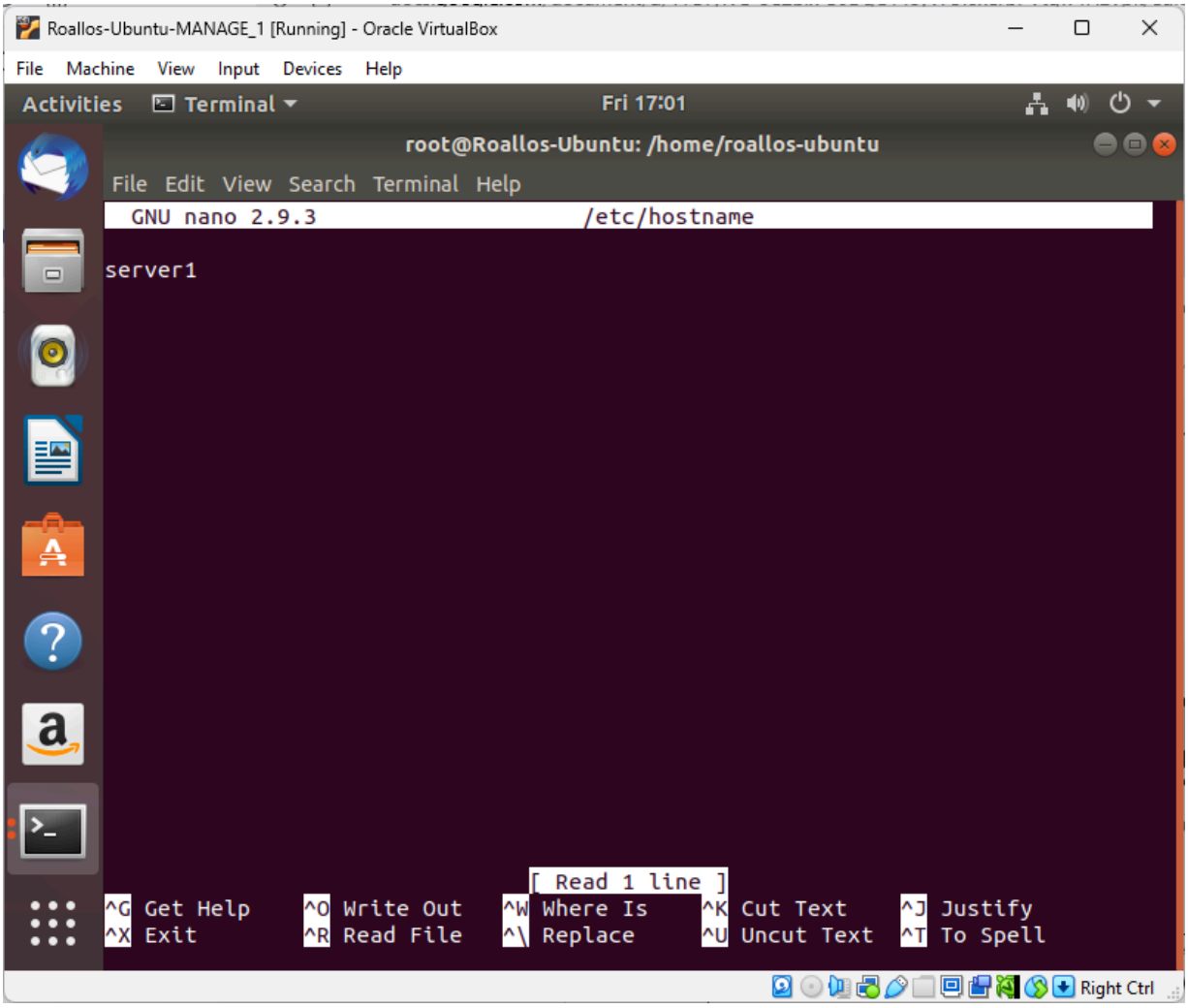
4.2 IP_address server 2 (provide the ip address of server 2 followed by the hostname)

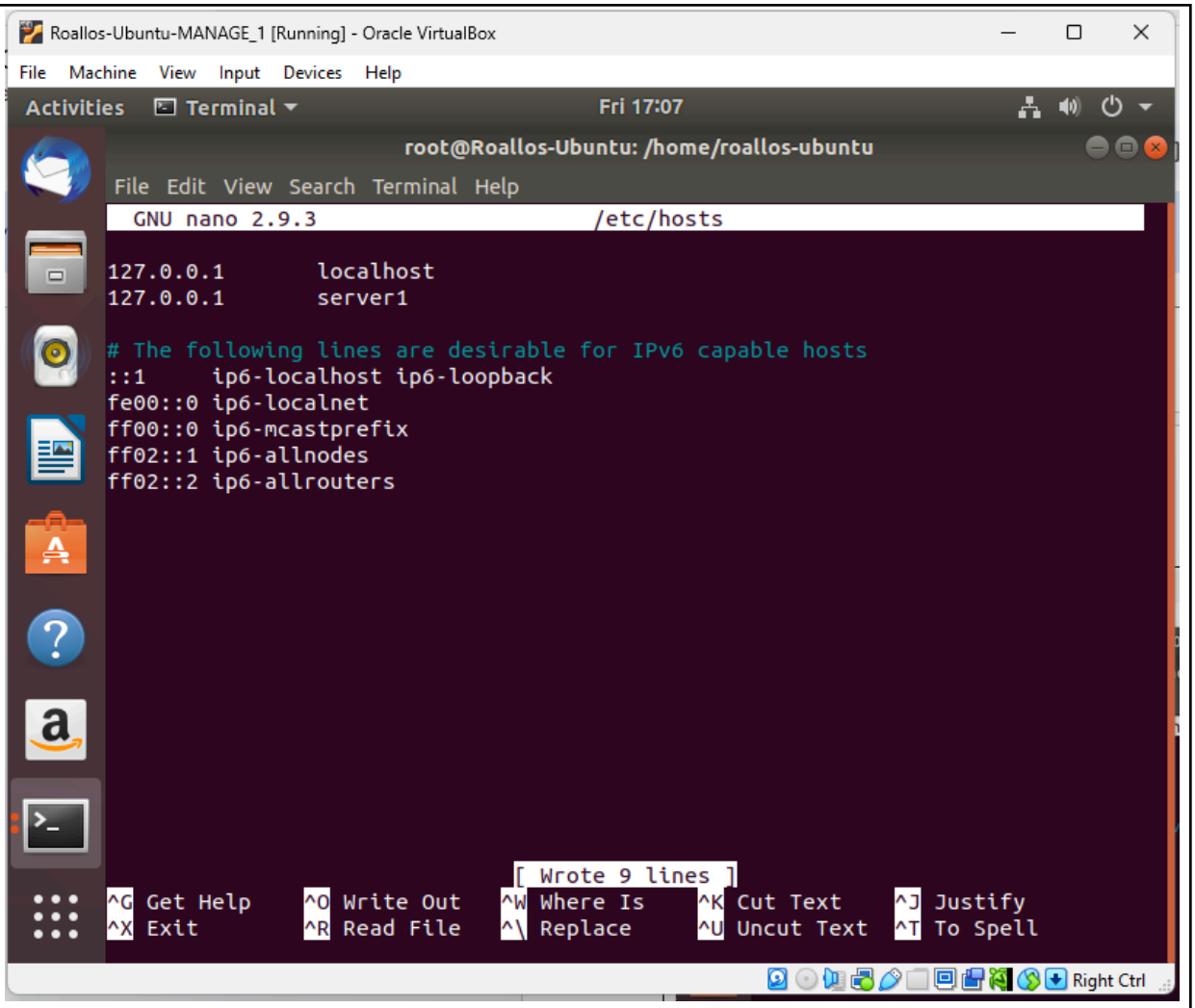
4.3 Save the file and exit.

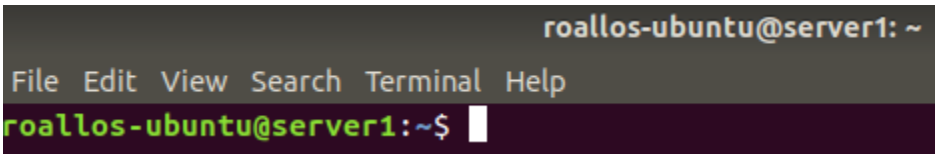
5. On the local machine, verify that you can do the SSH command but this time, use the hostname instead of typing the IP address of the servers. For example, try to do *ssh jvtaylar@server1*. Enter the password when prompted. Verify that you have entered Server 1. Do the same for Server 2.

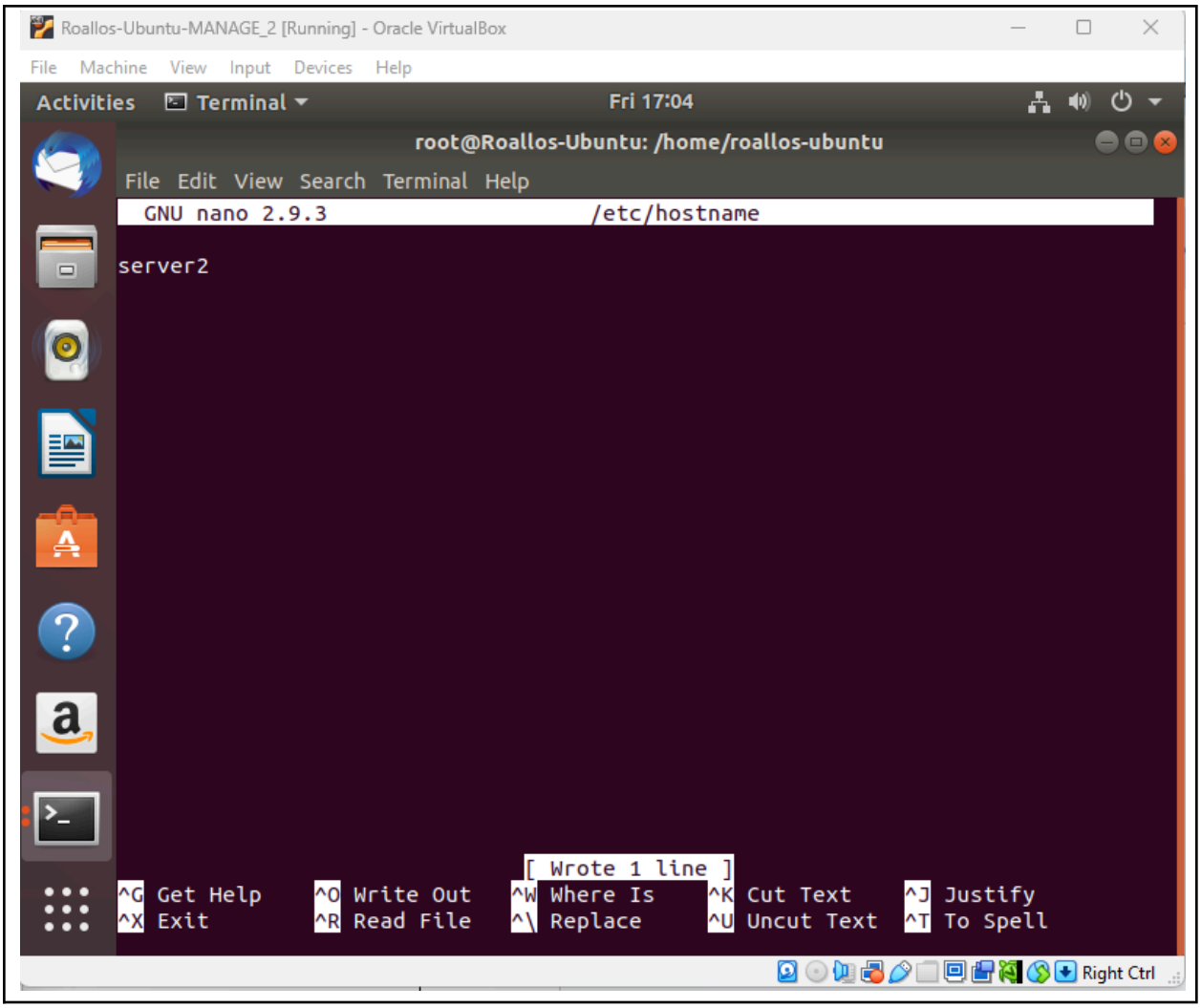
Screenshots:

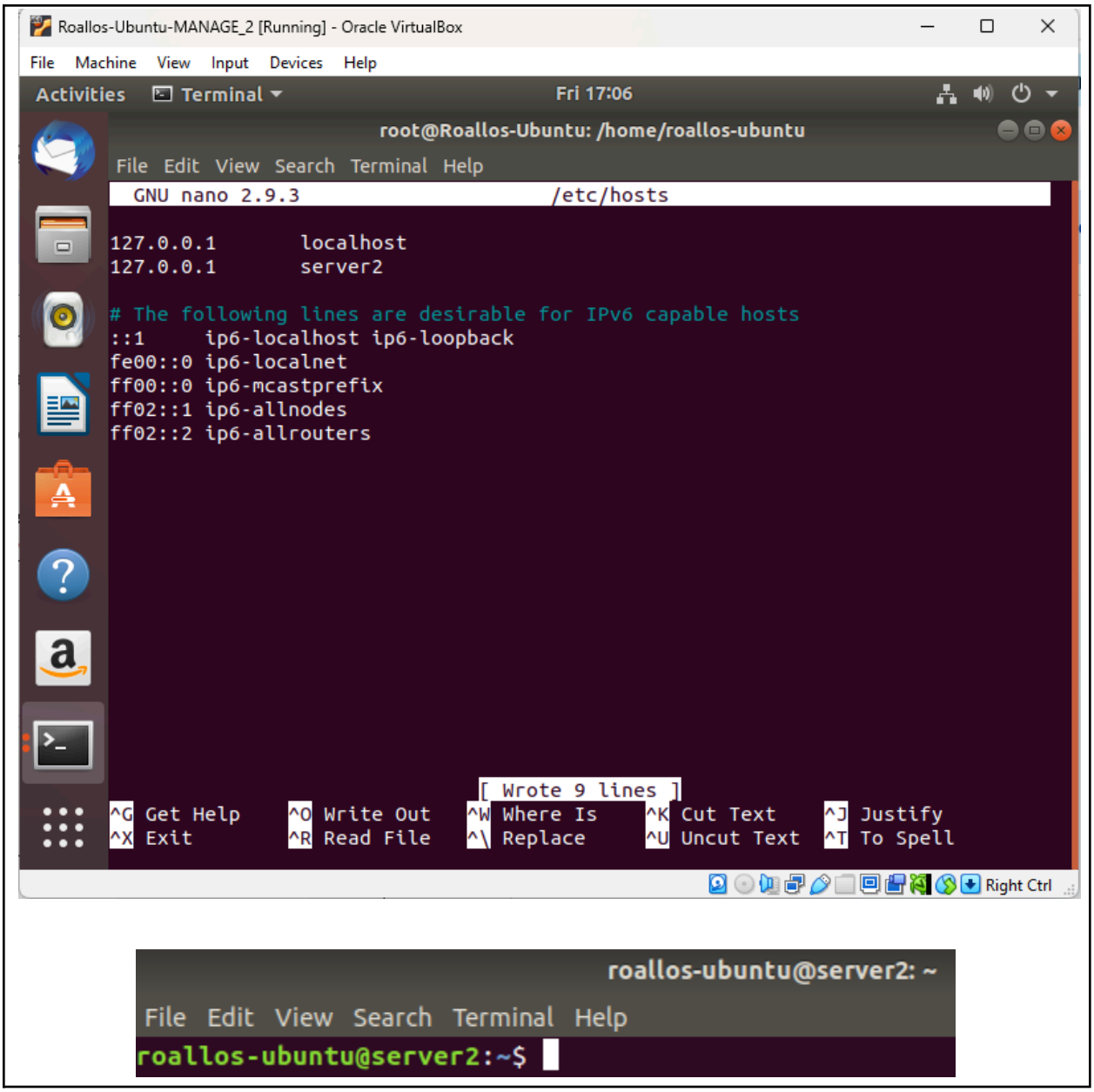
TASK #1:



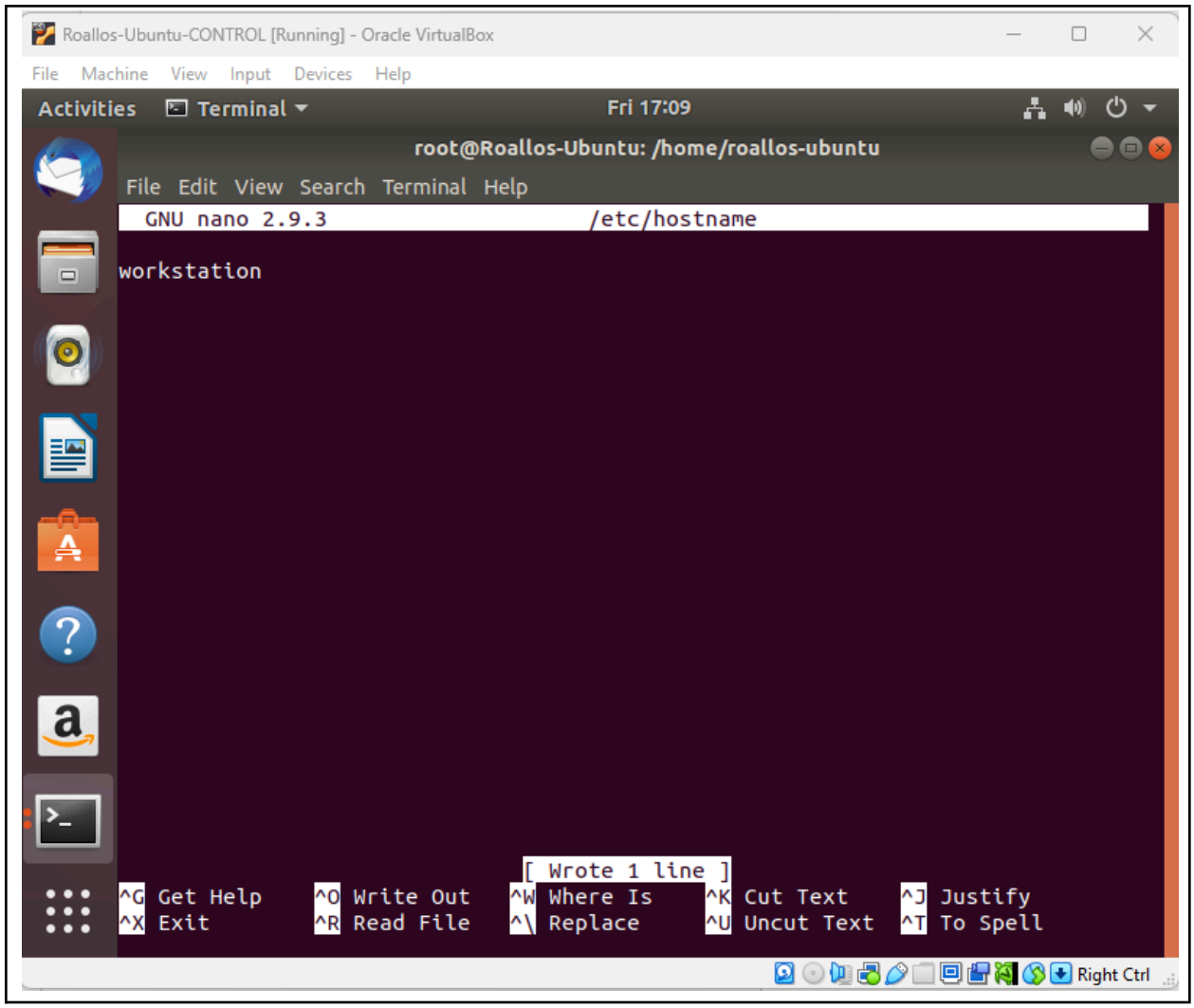

Roallos-Ubuntu-MANAGE_1 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Fri 17:07
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hosts
127.0.0.1 localhost
127.0.0.1 server1
The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
[Wrote 9 lines]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
Right Ctrl

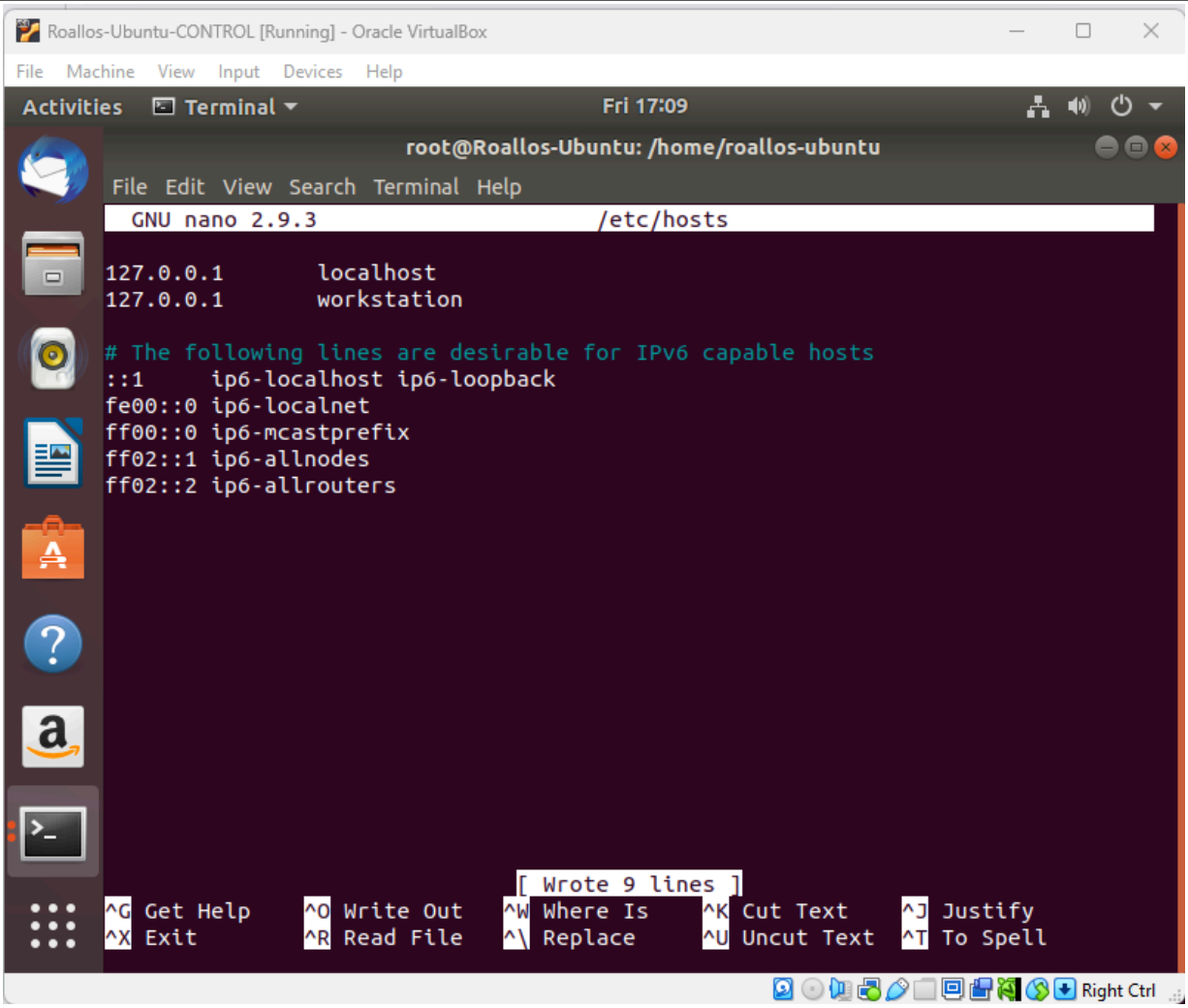

roallos-ubuntu@server1: ~
File Edit View Search Terminal Help
roallos-ubuntu@server1:~$

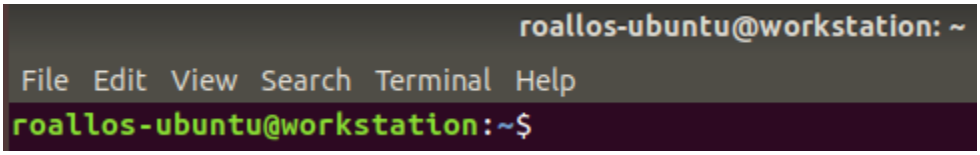

Roallos-Ubuntu-MANAGE_2 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Fri 17:04
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hostname
server2
[Wrote 1 line]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
Right Ctrl


Roallos-Ubuntu-MANAGE_2 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Fri 17:06
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hosts
127.0.0.1 localhost
127.0.0.1 server2
The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
[Wrote 9 lines]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
Right Ctrl

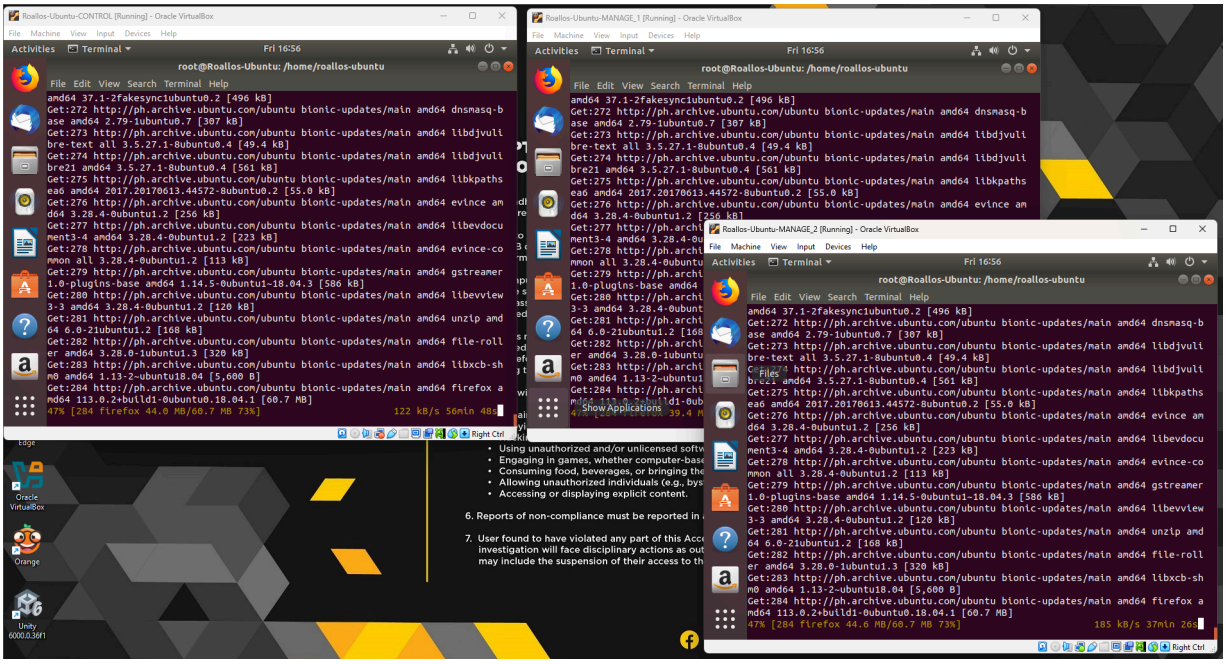
roallos-ubuntu@server2: ~
File Edit View Search Terminal Help
roallos-ubuntu@server2:~$

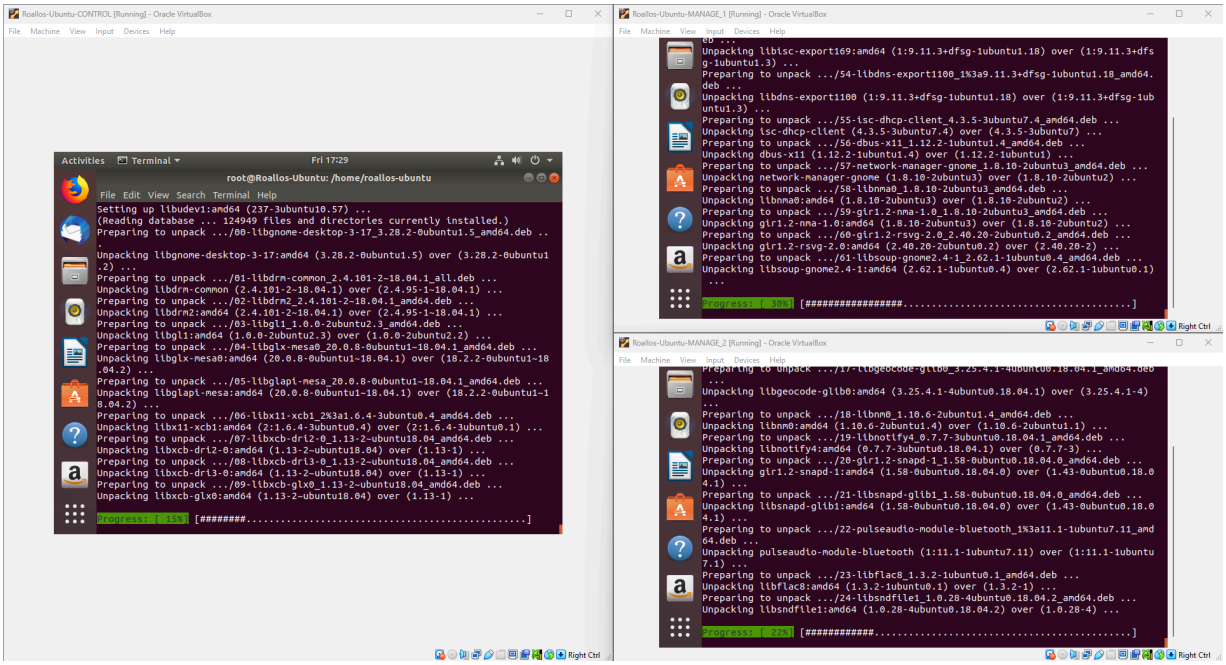

Roallos-Ubuntu-CONTROL [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Fri 17:09
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hostname
workstation
[Wrote 1 line]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
Right Ctrl

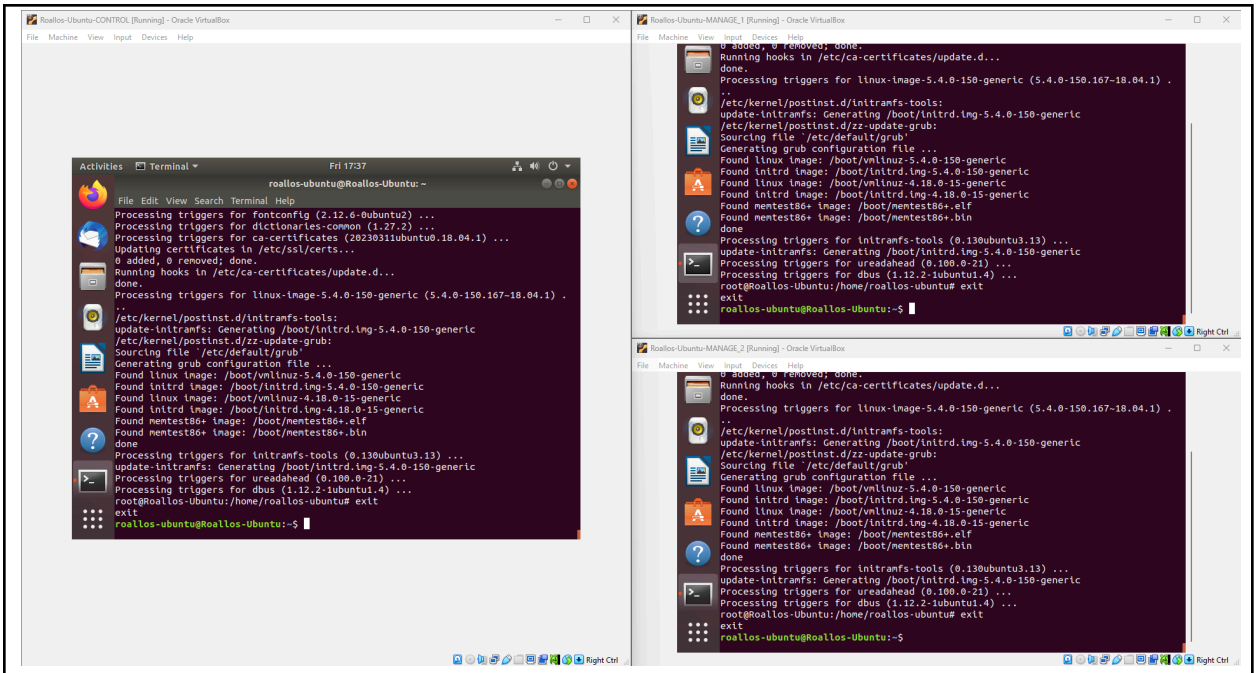

Roallos-Ubuntu-CONTROL [Running] - Oracle VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Fri 17:09
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hosts
127.0.0.1 localhost
127.0.0.1 workstation
The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
[Wrote 9 lines]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
Right Ctrl

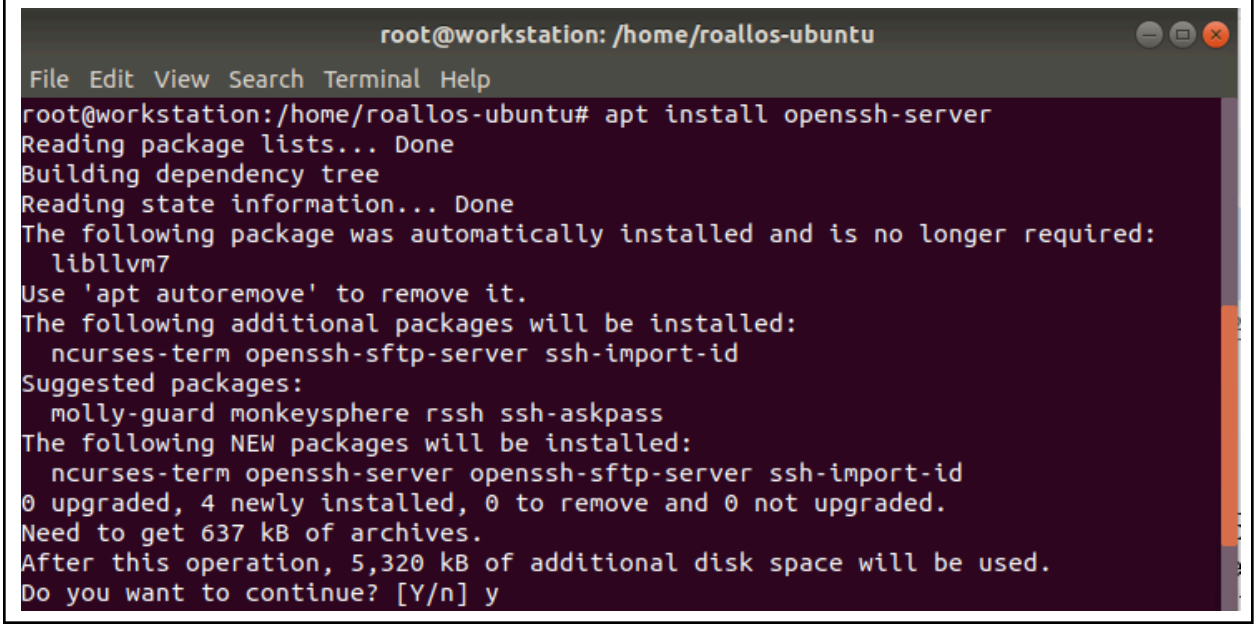

roallos-ubuntu@workstation: ~
File Edit View Search Terminal Help
roallos-ubuntu@workstation:~$

TASK #2:


Roallos-Ubuntu-CONTROL [Running] - Oracle VirtualBox
Roallos-Ubuntu-MANAGE_1 [Running] - Oracle VirtualBox
Roallos-Ubuntu-MANAGE_2 [Running] - Oracle VirtualBox
Activities
Terminal
Fri 16:56
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
Show Applications
Files
Oracle VirtualBox
Orange
Unity 6000.0.36f1
Right Ctrl


Roallos-Ubuntu-CONTROL [Running] - Oracle VirtualBox
Roallos-Ubuntu-MANAGE_1 [Running] - Oracle VirtualBox
Roallos-Ubuntu-MANAGE_2 [Running] - Oracle VirtualBox
Activities
Terminal
Fri 17:29
root@Roallos-Ubuntu: /home/roallos-ubuntu
File Edit View Search Terminal Help
Right Ctrl


Roallos-Ubuntu-CONTROL [Running] - Oracle VirtualBox
Roallos-Ubuntu-MANAGE_1 [Running] - Oracle VirtualBox
Roallos-Ubuntu-MANAGE_2 [Running] - Oracle VirtualBox
Activities
Terminal
Fri 17:37
roallos-ubuntu@Roallos-Ubuntu: ~
File Edit View Search Terminal Help
Processing triggers for fontconfig (2.12.6-0ubuntu2) ...
Processing triggers for dictionaries-common (1.27.2) ...
Processing triggers for ca-certificates (20230311ubuntu0.18.04.1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
Processing triggers for linux-image-5.4.0-150-generic (5.4.0-150.167~18.04.1) ...
/etc/kernel/postinst.d/initramfs-tools:
update-initramfs: Generating /boot/initrd.img-5.4.0-150-generic
/etc/kernel/postinst.d/zz-update-grub:
Sourcing file `/etc/default/grub'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.4.0-150-generic
Found initrd image: /boot/initrd.img-5.4.0-150-generic
Found linux image: /boot/vmlinuz-4.18.0-15-generic
Found initrd image: /boot/initrd.img-4.18.0-15-generic
Found memtest86+ image: /boot/memtest86+.elf
Found memtest86+ image: /boot/memtest86+.bin
done
Processing triggers for initramfs-tools (0.130ubuntu3.13) ...
update-initramfs: Generating /boot/initrd.img-5.4.0-150-generic
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for dbus (1.12.2-1ubuntu1.4) ...
root@Roallos-Ubuntu:/home/roallos-ubuntu# exit
exit
roallos-ubuntu@Roallos-Ubuntu:~$
Right Ctrl


root@workstation: /home/roallos-ubuntu
File Edit View Search Terminal Help
root@workstation:/home/roallos-ubuntu# apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
libllvm7
Use 'apt autoremove' to remove it.
The following additional packages will be installed:
ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
molly-guard monkeysphere rssh ssh-askpass
The following NEW packages will be installed:
ncurses-term openssh-server openssh-sftp-server ssh-import-id
0 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 637 kB of archives.
After this operation, 5,320 kB of additional disk space will be used.
Do you want to continue? [Y/n] y

```
root@workstation:/home/roallos-ubuntu# service ssh start
root@workstation:/home/roallos-ubuntu# systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: ena
   Active: active (running) since Fri 2025-08-08 17:45:28 +08; 1min 3s ago
 Main PID: 2905 (sshd)
    Tasks: 1 (limit: 4656)
   CGroup: /system.slice/ssh.service
           └─2905 /usr/sbin/sshd -D

Aug 08 17:45:28 workstation systemd[1]: Starting OpenBSD Secure Shell server...
Aug 08 17:45:28 workstation sshd[2905]: Server listening on 0.0.0.0 port 22.
Aug 08 17:45:28 workstation sshd[2905]: Server listening on :: port 22.
Aug 08 17:45:28 workstation systemd[1]: Started OpenBSD Secure Shell server.
lines 1-12/12 (END)
```

```
root@workstation:/home/roallos-ubuntu# ufw allow ssh
Rules updated
Rules updated (v6)
root@workstation:/home/roallos-ubuntu# ufw enable
Firewall is active and enabled on system startup
root@workstation:/home/roallos-ubuntu# ufw status
Status: active

To                         Action      From
--                         ------      ----
22/tcp                     ALLOW       Anywhere
22/tcp (v6)                ALLOW       Anywhere (v6)

root@workstation:/home/roallos-ubuntu#
```

root@server1: /home/roallos-ubuntu

File Edit View Search Terminal Help

```
root@server1:/home/roallos-ubuntu# apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libllvm7
Use 'apt autoremove' to remove it.
The following additional packages will be installed:
  ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
  molly-guard monkeysphere rssh ssh-askpass
The following NEW packages will be installed:
  ncurses-term openssh-server openssh-sftp-server ssh-import-id
0 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 637 kB of archives.
After this operation, 5,320 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

```
root@server1:/home/roallos-ubuntu# service ssh start
root@server1:/home/roallos-ubuntu# systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: ena
   Active: active (running) since Fri 2025-08-08 17:45:56 +08; 58s ago
 Main PID: 3337 (sshd)
    Tasks: 1 (limit: 4656)
   CGroup: /system.slice/ssh.service
           └─3337 /usr/sbin/sshd -D

Aug 08 17:45:56 server1 systemd[1]: Starting OpenBSD Secure Shell server...
Aug 08 17:45:56 server1 sshd[3337]: Server listening on 0.0.0.0 port 22.
Aug 08 17:45:56 server1 sshd[3337]: Server listening on :: port 22.
Aug 08 17:45:56 server1 systemd[1]: Started OpenBSD Secure Shell server.
lines 1-12/12 (END)
```

```
root@server1:/home/roallos-ubuntu# ufw allow ssh
Rules updated
Rules updated (v6)
root@server1:/home/roallos-ubuntu# ufw enable
Firewall is active and enabled on system startup
root@server1:/home/roallos-ubuntu# ufw status
Status: active

To                         Action      From
--                         ------      ----
22/tcp                     ALLOW       Anywhere
22/tcp (v6)                ALLOW       Anywhere (v6)

root@server1:/home/roallos-ubuntu#
```

```
root@server2: /home/roallos-ubuntu
File  Edit  View  Search  Terminal  Help
root@server2:/home/roallos-ubuntu# apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  libllvm7
Use 'apt autoremove' to remove it.
The following additional packages will be installed:
  ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
  molly-guard monkeysphere rssh ssh-askpass
The following NEW packages will be installed:
  ncurses-term openssh-server openssh-sftp-server ssh-import-id
0 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 637 kB of archives.
After this operation, 5,320 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

```
root@server2:/home/roallos-ubuntu# service ssh start
root@server2:/home/roallos-ubuntu# systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: ena
   Active: active (running) since Fri 2025-08-08 17:46:11 +08; 1min 6s ago
 Main PID: 2904 (sshd)
    Tasks: 1 (limit: 4656)
   CGroup: /system.slice/ssh.service
           └─2904 /usr/sbin/sshd -D

Aug 08 17:46:11 server2 systemd[1]: Starting OpenBSD Secure Shell server...
Aug 08 17:46:11 server2 sshd[2904]: Server listening on 0.0.0.0 port 22.
Aug 08 17:46:11 server2 systemd[1]: Started OpenBSD Secure Shell server.
Aug 08 17:46:11 server2 sshd[2904]: Server listening on :: port 22.
lines 1-12/12 (END)
```

```
root@server2:/home/roallos-ubuntu# ufw allow ssh
Rules updated
Rules updated (v6)
root@server2:/home/roallos-ubuntu# ufw enable
Firewall is active and enabled on system startup
root@server2:/home/roallos-ubuntu# ufw status
Status: active

To                         Action      From
--                         ------      ----
22/tcp                     ALLOW       Anywhere
22/tcp (v6)                ALLOW       Anywhere (v6)

root@server2:/home/roallos-ubuntu#
```

TASK #3:

```
roallos-ubuntu@workstation:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::f9be:1e81:6e93:5802  prefixlen 64  scopeid 0x20<link>
        inet6 fd00::b842:9f32:a11a:662a  prefixlen 64  scopeid 0x0<global>
        inet6 fd00::cdc:46b4:140d:6b0d  prefixlen 64  scopeid 0x0<global>
        ether 08:00:27:bc:88:45  txqueuelen 1000  (Ethernet)
        RX packets 4876  bytes 5662120 (5.6 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1308  bytes 109777 (109.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.104  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::ba94:6e4b:aeee:96b  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:d3:23:3f  txqueuelen 1000  (Ethernet)
        RX packets 406  bytes 67199 (67.1 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 72  bytes 8427 (8.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
roallos-ubuntu@server1:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fd00::b585:24e2:6e4d:4648  prefixlen 64  scopeid 0x0<global>
        inet6 fd00::3d65:2384:d2bf:20a5  prefixlen 64  scopeid 0x0<global>
        inet6 fe80::2639:b7b3:4fb6:cbea  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:47:1e:f2  txqueuelen 1000  (Ethernet)
        RX packets 5054  bytes 5679886 (5.6 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1482  bytes 121974 (121.9 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.105  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::b2d0:5bc1:c50b:dede  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:9b:46:07  txqueuelen 1000  (Ethernet)
        RX packets 306  bytes 52809 (52.8 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 67  bytes 8038 (8.0 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
roallos-ubuntu@server2:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fd00::298a:927e:cb04:b8de  prefixlen 64  scopeid 0x0<global>
        inet6 fd00::29a4:881e:d02:7ffe  prefixlen 64  scopeid 0x0<global>
        inet6 fe80::38ba:78cc:fa10:82c5  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:3a:69:9b  txqueuelen 1000  (Ethernet)
        RX packets 4961  bytes 5665902 (5.6 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 1390  bytes 113654 (113.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.56.106  netmask 255.255.255.0  broadcast 192.168.56.255
        inet6 fe80::b31d:eb73:67e7:3aef  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:81:9e:01  txqueuelen 1000  (Ethernet)
        RX packets 190  bytes 35975 (35.9 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 64  bytes 7643 (7.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Server 1 IP: 192.168.56.105
Server 2 IP: 192.168.56.106
Workstation IP: 192.168.56.104

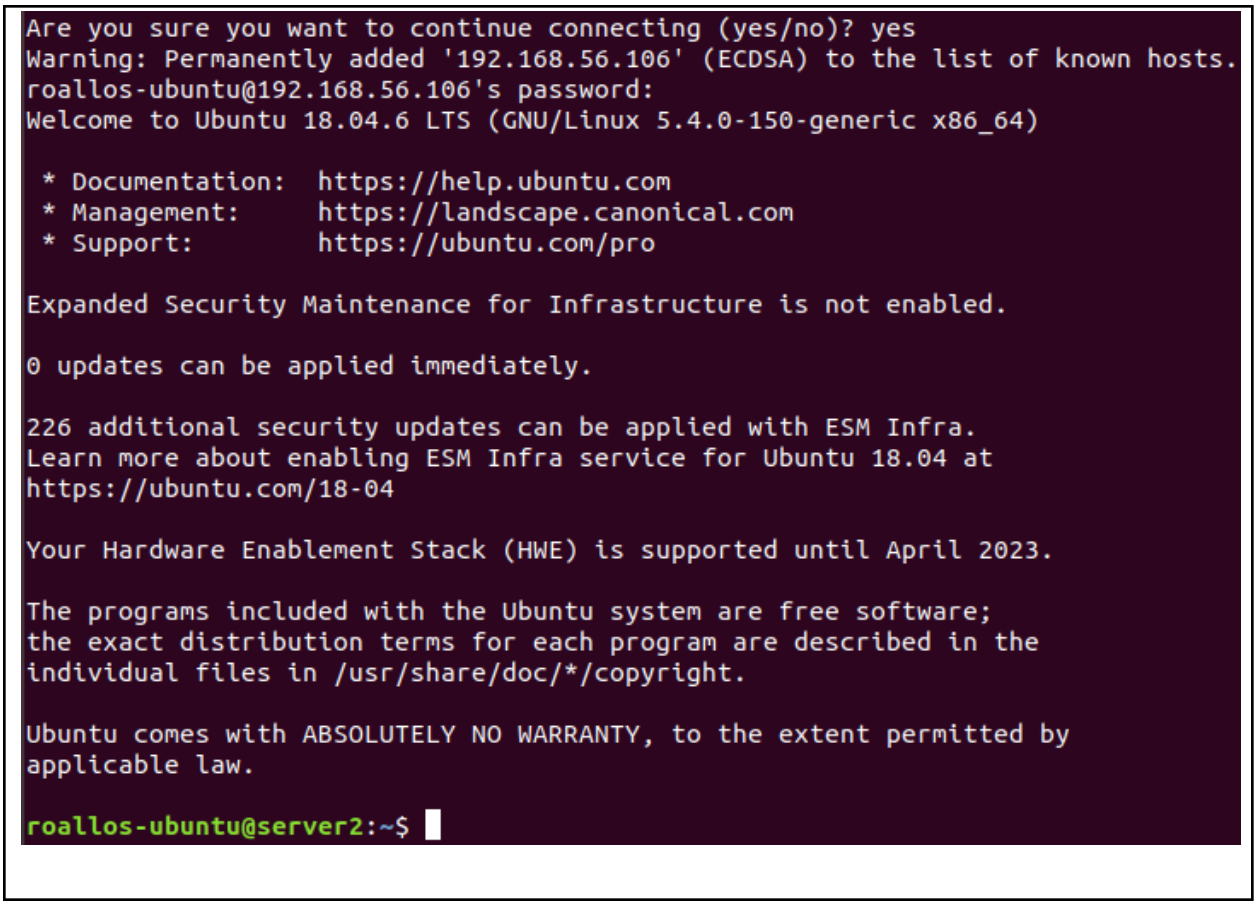
```
roallos-ubuntu@workstation:~$ ping -c 4 192.168.56.105
PING 192.168.56.105 (192.168.56.105) 56(84) bytes of data.
64 bytes from 192.168.56.105: icmp_seq=1 ttl=64 time=0.573 ms
64 bytes from 192.168.56.105: icmp_seq=2 ttl=64 time=0.423 ms
64 bytes from 192.168.56.105: icmp_seq=3 ttl=64 time=0.424 ms
64 bytes from 192.168.56.105: icmp_seq=4 ttl=64 time=0.424 ms

--- 192.168.56.105 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3088ms
rtt min/avg/max/mdev = 0.423/0.461/0.573/0.064 ms
roallos-ubuntu@workstation:~$ ping -c 4 192.168.56.106
PING 192.168.56.106 (192.168.56.106) 56(84) bytes of data.
64 bytes from 192.168.56.106: icmp_seq=1 ttl=64 time=0.874 ms
64 bytes from 192.168.56.106: icmp_seq=2 ttl=64 time=0.418 ms
64 bytes from 192.168.56.106: icmp_seq=3 ttl=64 time=0.507 ms
64 bytes from 192.168.56.106: icmp_seq=4 ttl=64 time=0.417 ms

--- 192.168.56.106 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3073ms
rtt min/avg/max/mdev = 0.417/0.554/0.874/0.188 ms
roallos-ubuntu@workstation:~$
```

```
roallos-ubuntu@server1:~$ ping -c 4 192.168.56.106
PING 192.168.56.106 (192.168.56.106) 56(84) bytes of data.
64 bytes from 192.168.56.106: icmp_seq=1 ttl=64 time=0.872 ms
64 bytes from 192.168.56.106: icmp_seq=2 ttl=64 time=0.433 ms
64 bytes from 192.168.56.106: icmp_seq=3 ttl=64 time=0.421 ms
64 bytes from 192.168.56.106: icmp_seq=4 ttl=64 time=0.396 ms

--- 192.168.56.106 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3054ms
rtt min/avg/max/mdev = 0.396/0.530/0.872/0.198 ms
roallos-ubuntu@server1:~$
```

TASK #4:

```
roallos-ubuntu@workstation:~$ ssh roallos-ubuntu@192.168.56.105
Are you sure you want to continue connecting (yes/no)? y
Please type 'yes' or 'no': yes
Warning: Permanently added '192.168.56.105' (ECDSA) to the list of known hosts.
roallos-ubuntu@192.168.56.105's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-150-generic x86_64)

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

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

226 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

Your Hardware Enablement Stack (HWE) is supported until April 2023.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

roallos-ubuntu@server1:~$
```

```
roallos-ubuntu@server1:~$ logout
Connection to 192.168.56.105 closed.
roallos-ubuntu@workstation:~$ ssh roallos-ubuntu@192.168.56.106
```


Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.56.106' (ECDSA) to the list of known hosts.
roallos-ubuntu@192.168.56.106's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-150-generic x86_64)
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
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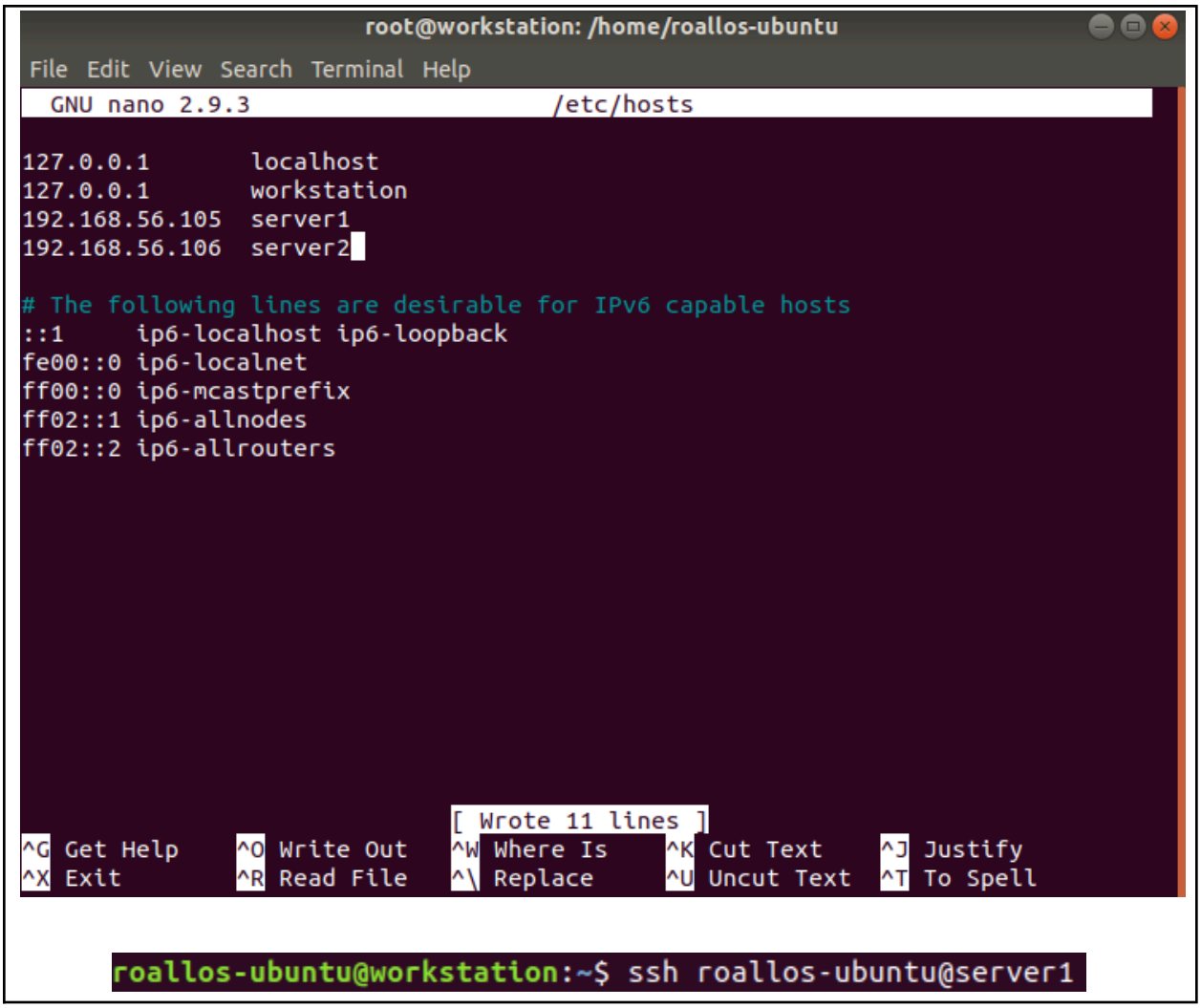
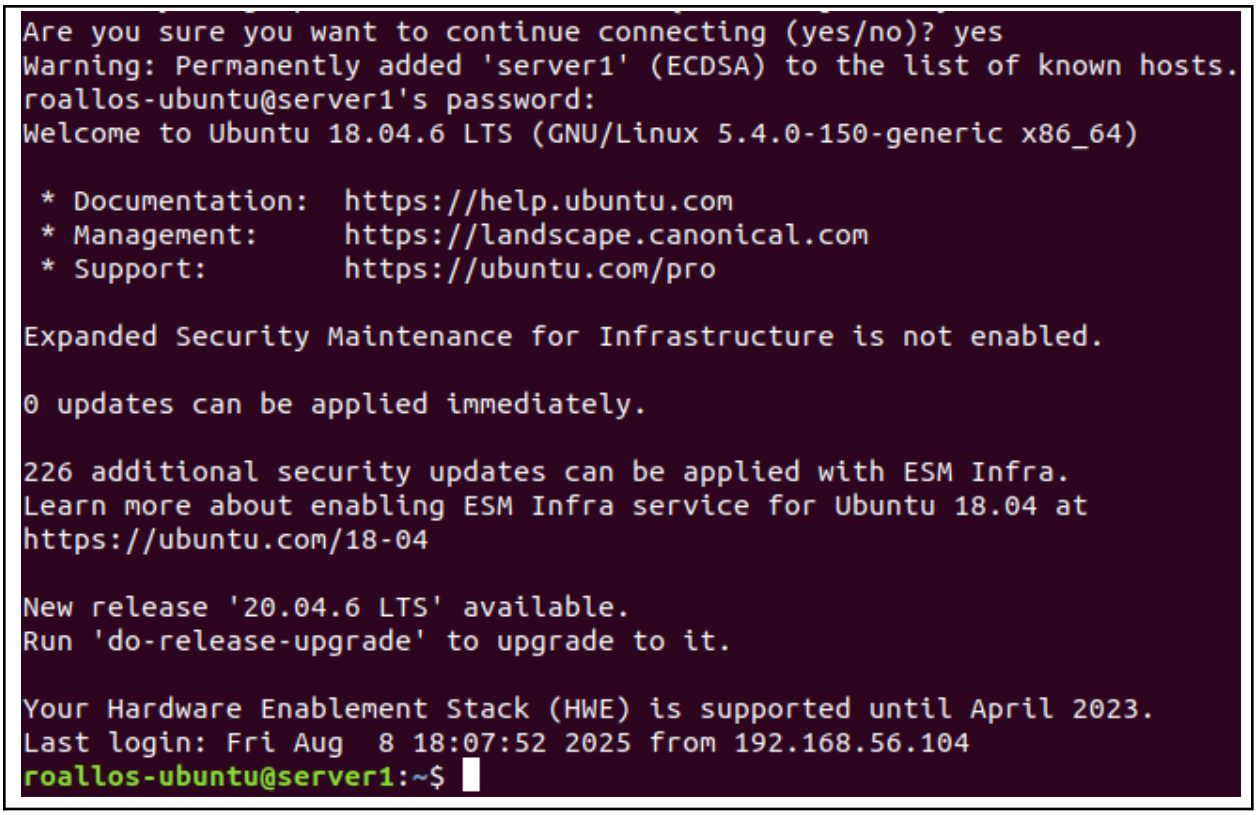
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
roallos-ubuntu@server2:~$


root@workstation: /home/roallos-ubuntu
File Edit View Search Terminal Help
GNU nano 2.9.3 /etc/hosts
127.0.0.1 localhost
127.0.0.1 workstation
192.168.56.105 server1
192.168.56.106 server2
The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
[Wrote 11 lines]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
roallos-ubuntu@workstation:~$ ssh roallos-ubuntu@server1


Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'server1' (ECDSA) to the list of known hosts.
roallos-ubuntu@server1's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-150-generic x86_64)
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/pro
Expanded Security Maintenance for Infrastructure is not enabled.
0 updates can be applied immediately.
226 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04
New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
Your Hardware Enablement Stack (HWE) is supported until April 2023.
Last login: Fri Aug 8 18:07:52 2025 from 192.168.56.104
roallos-ubuntu@server1:~$

```
roallos-ubuntu@server1:~$ logout
Connection to server1 closed.
roallos-ubuntu@workstation:~$ ssh roallos-ubuntu@server2
The authenticity of host 'server2 (192.168.56.106)' can't be established.
ECDSA key fingerprint is SHA256:wSUDUYm9YS5dBE/sDm7u3/ku5m+IwyMyUha9KOXpOeM.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'server2' (ECDSA) to the list of known hosts.
roallos-ubuntu@server2's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-150-generic x86_64)

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

Expanded Security Maintenance for Infrastructure is not enabled.

0 updates can be applied immediately.

226 additional security updates can be applied with ESM Infra.
Learn more about enabling ESM Infra service for Ubuntu 18.04 at
https://ubuntu.com/18-04

New release '20.04.6 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2023.
Last login: Fri Aug  8 18:13:11 2025 from 192.168.56.104
roallos-ubuntu@server2:~$
```

Reflections:

Answer the following:

1. How are we able to use the hostname instead of IP address in SSH commands?
2. How secured is SSH?

Since we have entered the IP and associated the hostname to it from the /etc/hosts file, using the hostname would refer to the connected IP address. The Secure Shell (SSH) cryptographic keys in order to verify the identity of the machine that would connect to a server. This also encrypts the data transferred between the control and managed nodes.