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Course/Section: CPE31S24	Date Submitted: 27/08/2022
Instructor: Engr. Jonathan Taylar	Semester and SY: 1st Sem, 2022-2023

Activity 1: Configure Network using Virtual Machines

1. **Objectives:**

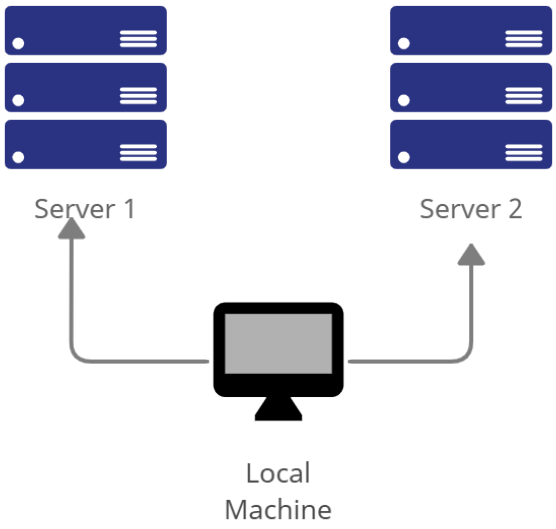
1.1. Create and configure Virtual Machines in Microsoft Azure or VirtualBox

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*).



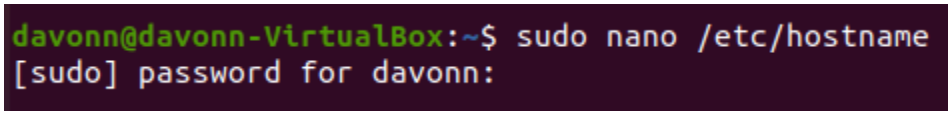
Task 1: Do the following on Server 1, Server 2, and Local Machine. In editing the file using nano command, press control + O to write out (save the file). Press enter when asked for the name of the file. Press control + X to end.

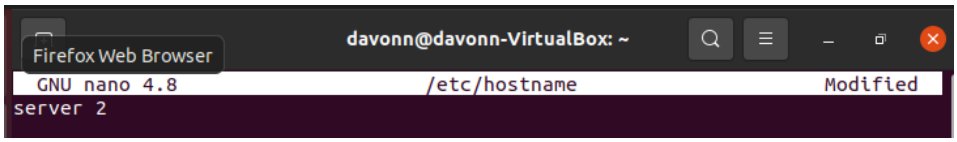
1. Change the hostname using the command *sudo nano /etc/hostname*

1.1 Use server1 for Server 1

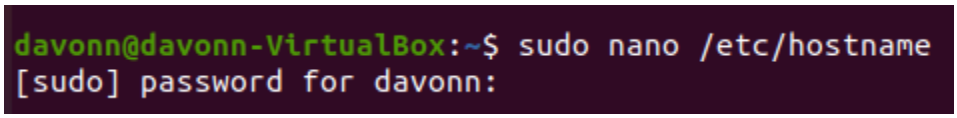
```
davonn@davonn-VirtualBox:~$ sudo nano /etc/hostname
[sudo] password for davonn:
```

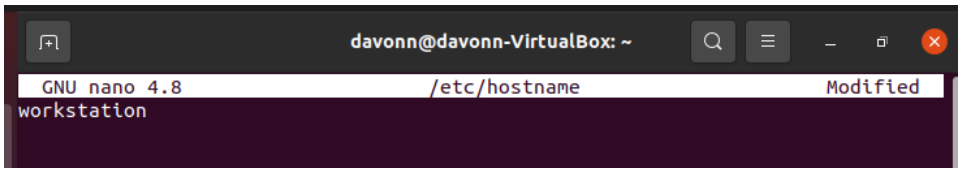
1.2 Use server2 for Server 2





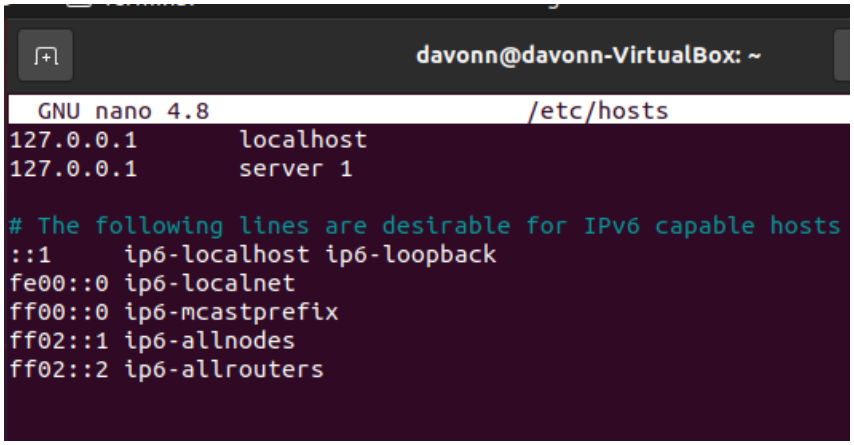
1.3 Use workstation for the Local Machine



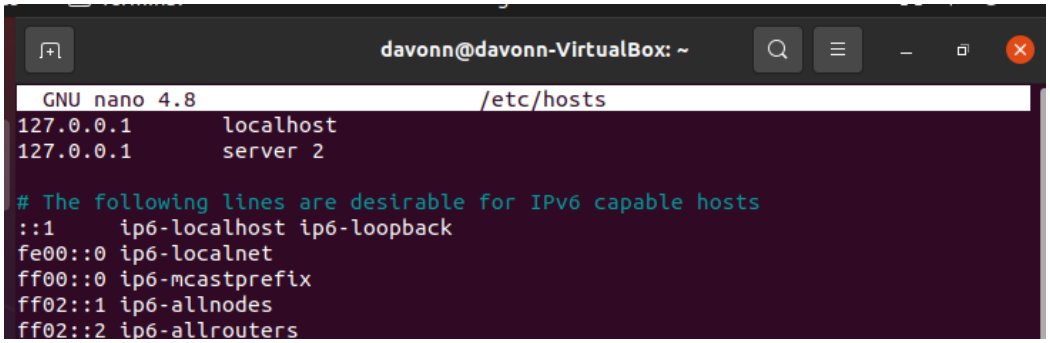


2. Edit the hosts using the command *sudo nano /etc/hosts*. Edit the second line.

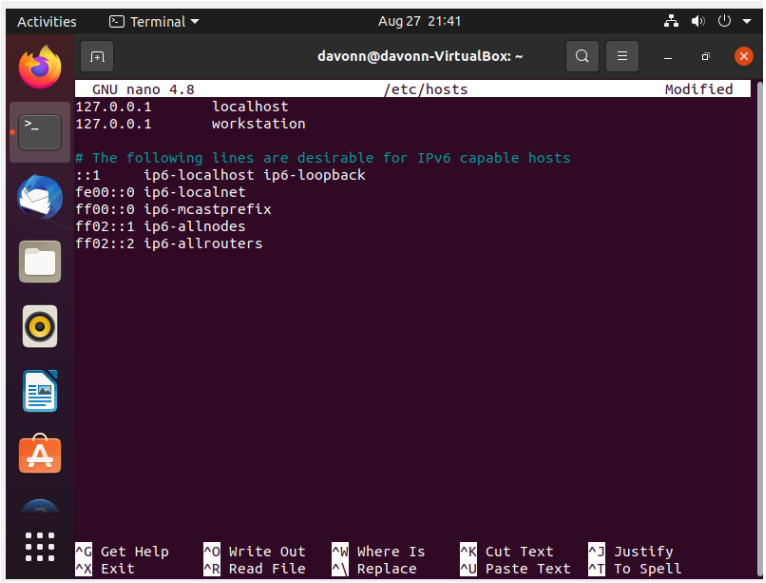
2.1 Type 127.0.0.1 server 1 for Server 1



2.2 Type 127.0.0.1 server 2 for Server 2



2.3 Type 127.0.0.1 workstation for the Local Machine



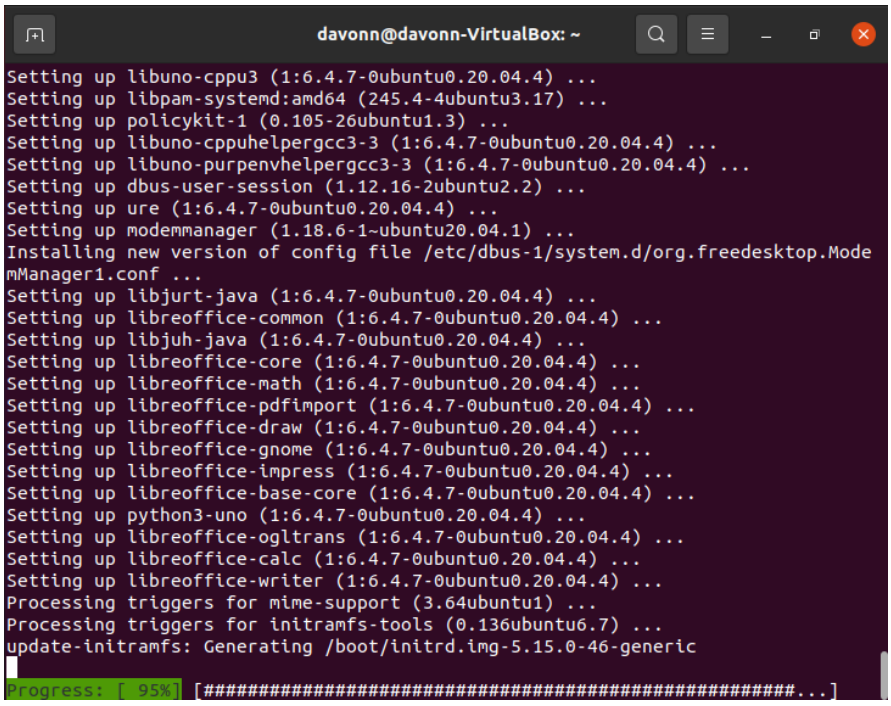
Task 2: Configure SSH on Server 1, Server 2, and Local Machine. Do the following:

1. Upgrade the packages by issuing the command *sudo apt update* and *sudo apt upgrade* respectively.

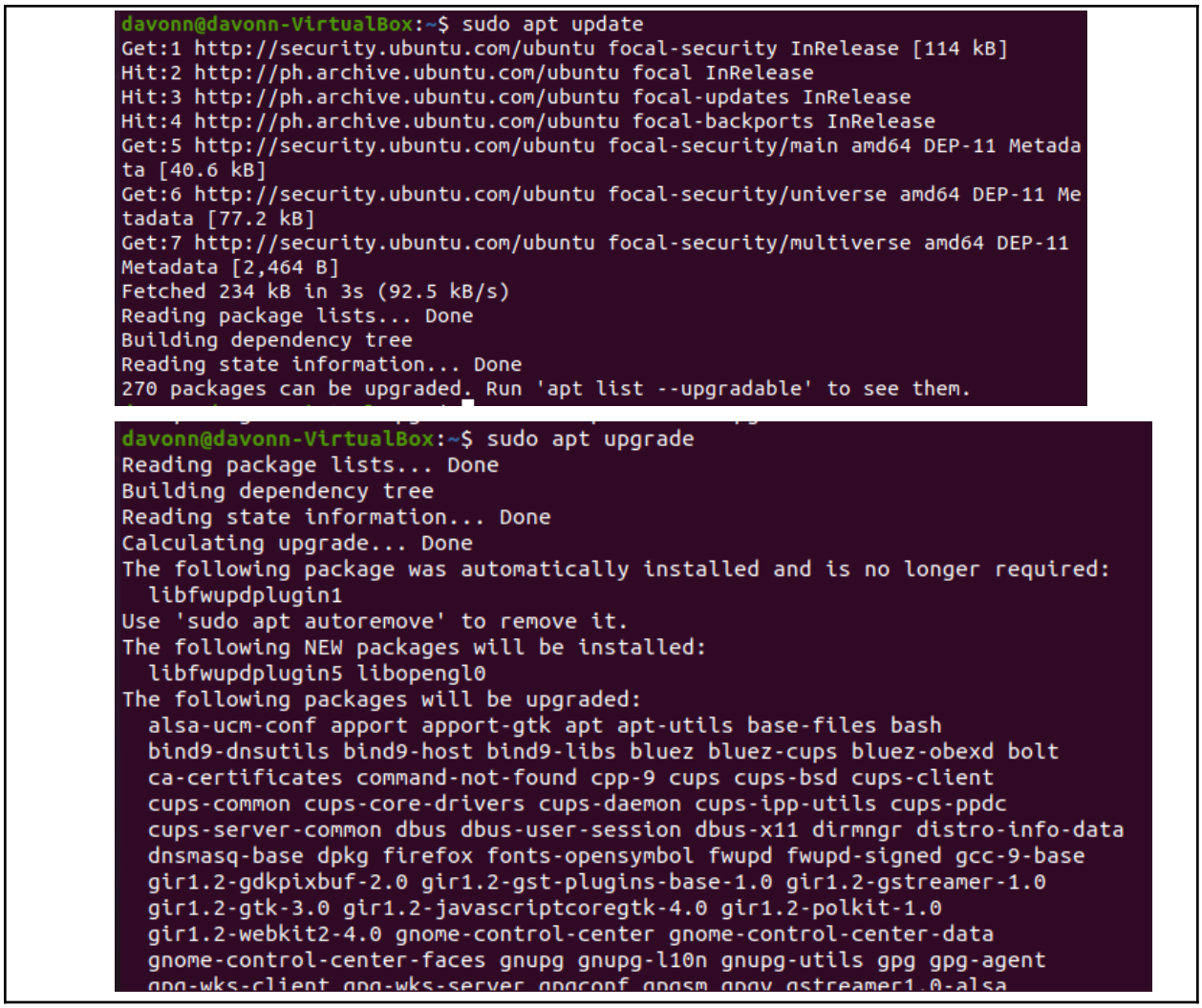
Server 1

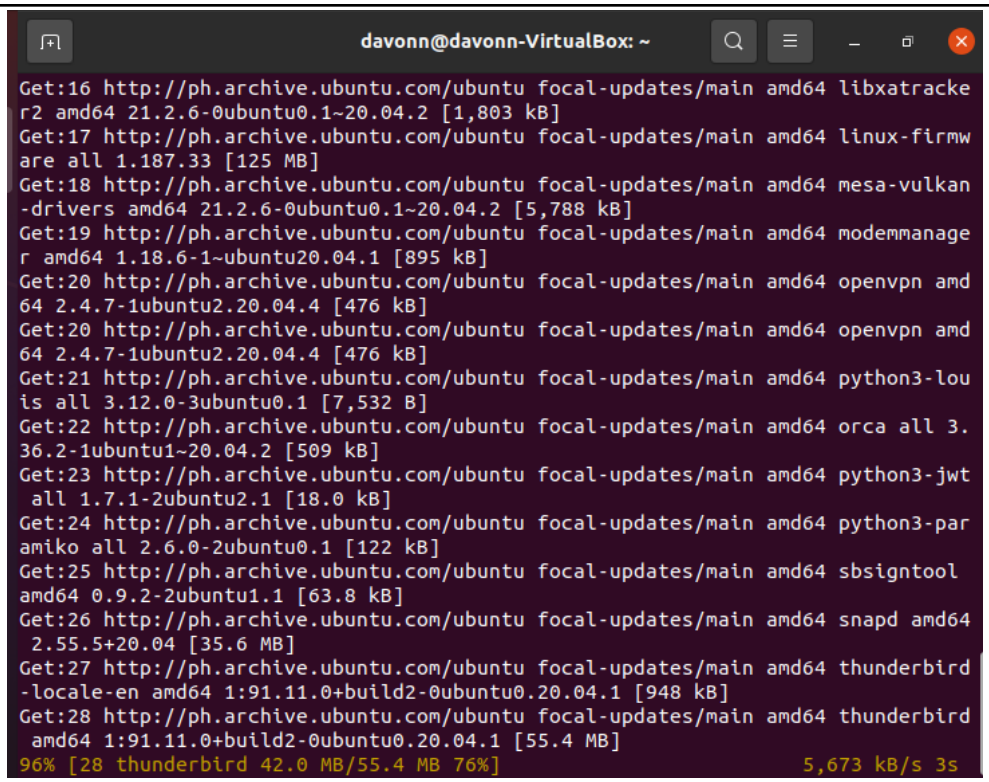
```
davonn@davonn-VirtualBox:~$ sudo apt update
Hit:1 http://ph.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://ph.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://ph.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metada
ta [40.6 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Me
tadata [77.2 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11
Metadata [2,464 B]
Fetched 234 kB in 2s (113 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
270 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

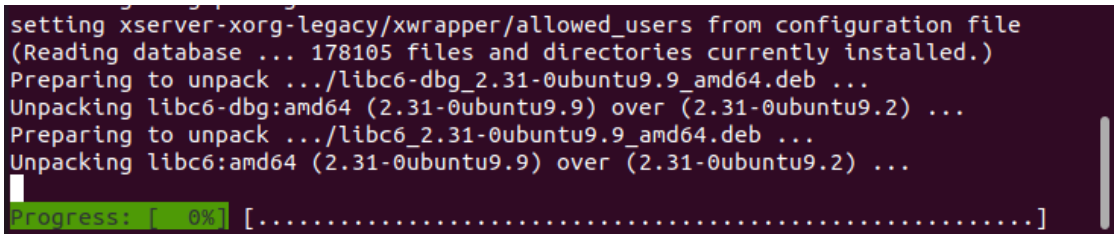
```
davonn@davonn-VirtualBox:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
  libfwupdplugin1
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  libfwupdplugin5 libopengl0
The following packages will be upgraded:
  alsa-ucm-conf apport apport-gtk apt apt-utils base-files bash
  bind9-dnsutils bind9-host bind9-libs bluez bluez-cups bluez-obexd bolt
  ca-certificates command-not-found cpp-9 cups cups-bsd cups-client
  cups-common cups-core-drivers cups-daemon cups-ipp-utils cups-ppdc
  cups-server-common dbus dbus-user-session dbus-x11 dirmngr distro-info-data
  dnsmasq-base dpkg firefox fonts-opensymbol fwupd fwupd-signed gcc-9-base
  gir1.2-gdkpixbuf-2.0 gir1.2-gst-plugins-base-1.0 gir1.2-gstreamer-1.0
  gir1.2-gtk-3.0 gir1.2-javascriptcoregtk-4.0 gir1.2-polkit-1.0
  gir1.2-webkit2-4.0 gnome-control-center gnome-control-center-data
  gnome-control-center-faces gnupg gnupg-l10n gnupg-utils gpg gpg-agent
  gpg-wks-client gpg-wks-server gpgconf gpgsm gpgv gstreamer1.0-alsa
  gstreamer1.0-gl gstreamer1.0-gtk3 gstreamer1.0-plugins-base
  gstreamer1.0-plugins-base-apps gstreamer1.0-plugins-good
  gstreamer1.0-pulseaudio gstreamer1.0-tools gstreamer1.0-x
```



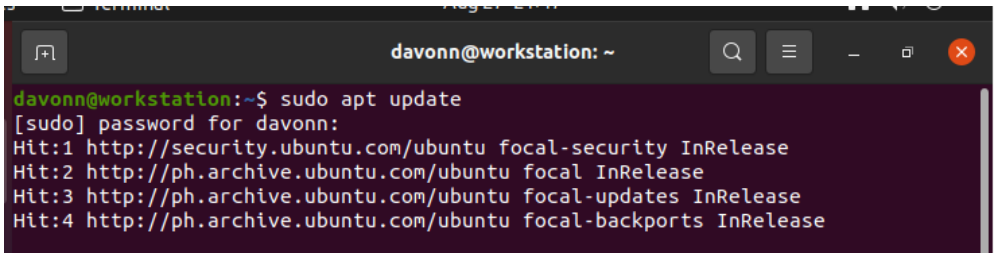
Server 2

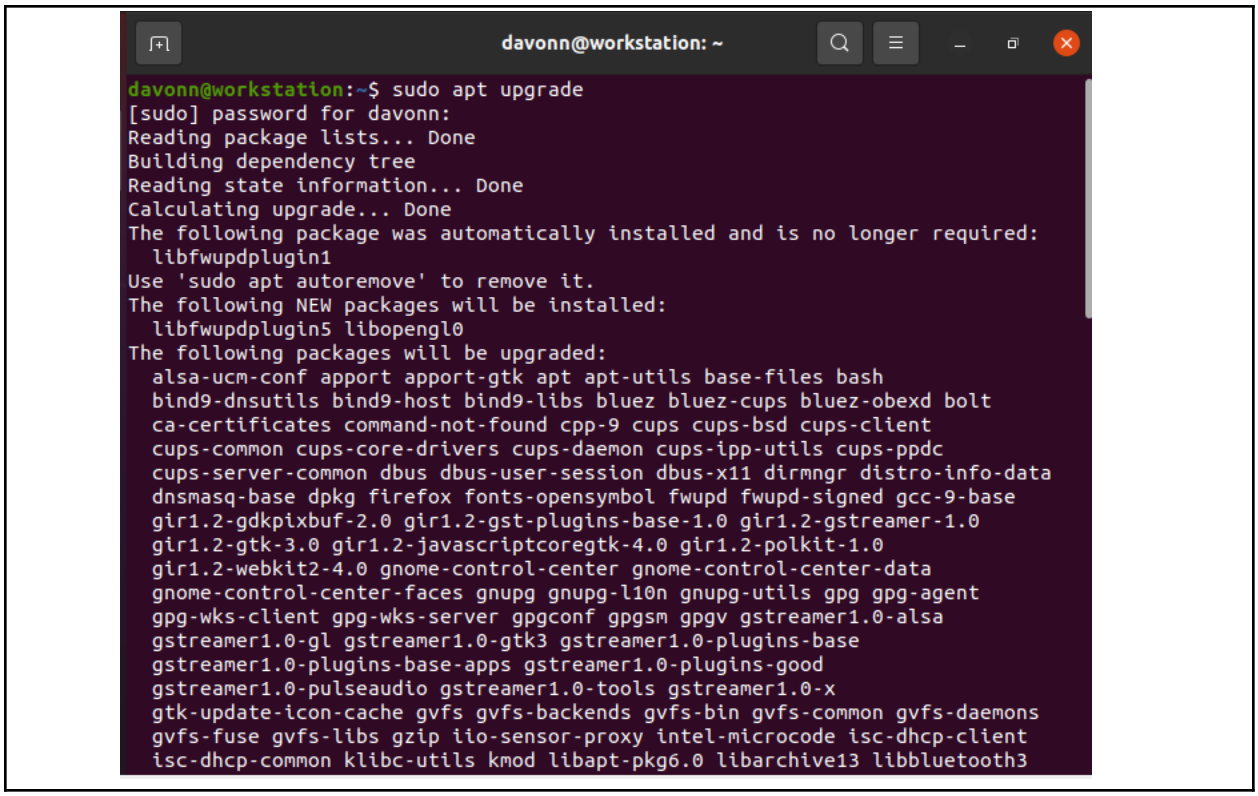

davonn@davonn-VirtualBox:~$ sudo apt update
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:2 http://ph.archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://ph.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:4 http://ph.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [40.6 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [77.2 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [2,464 B]
Fetched 234 kB in 3s (92.5 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
270 packages can be upgraded. Run 'apt list --upgradable' to see them.
davonn@davonn-VirtualBox:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
libfwupdplugin1
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
libfwupdplugin5 libopengl0
The following packages will be upgraded:
alsa-ucm-conf apport apport-gtk apt apt-utils base-files bash
bind9-dnsutils bind9-host bind9-libs bluez bluez-cups bluez-obexd bolt
ca-certificates command-not-found cpp-9 cups cups-bsd cups-client
cups-common cups-core-drivers cups-daemon cups-ipp-utils cups-ppdc
cups-server-common dbus dbus-user-session dbus-x11 dirmngr distro-info-data
dnsmasq-base dpkg firefox fonts-opensymbol fwupd fwupd-signed gcc-9-base
gir1.2-gdkpixbuf-2.0 gir1.2-gst-plugins-base-1.0 gir1.2-gstreamer-1.0
gir1.2-gtk-3.0 gir1.2-javascriptcoregtk-4.0 gir1.2-polkit-1.0
gir1.2-webkit2-4.0 gnome-control-center gnome-control-center-data
gnome-control-center-faces gnupg gnupg-l10n gnupg-utils gpg gpg-agent

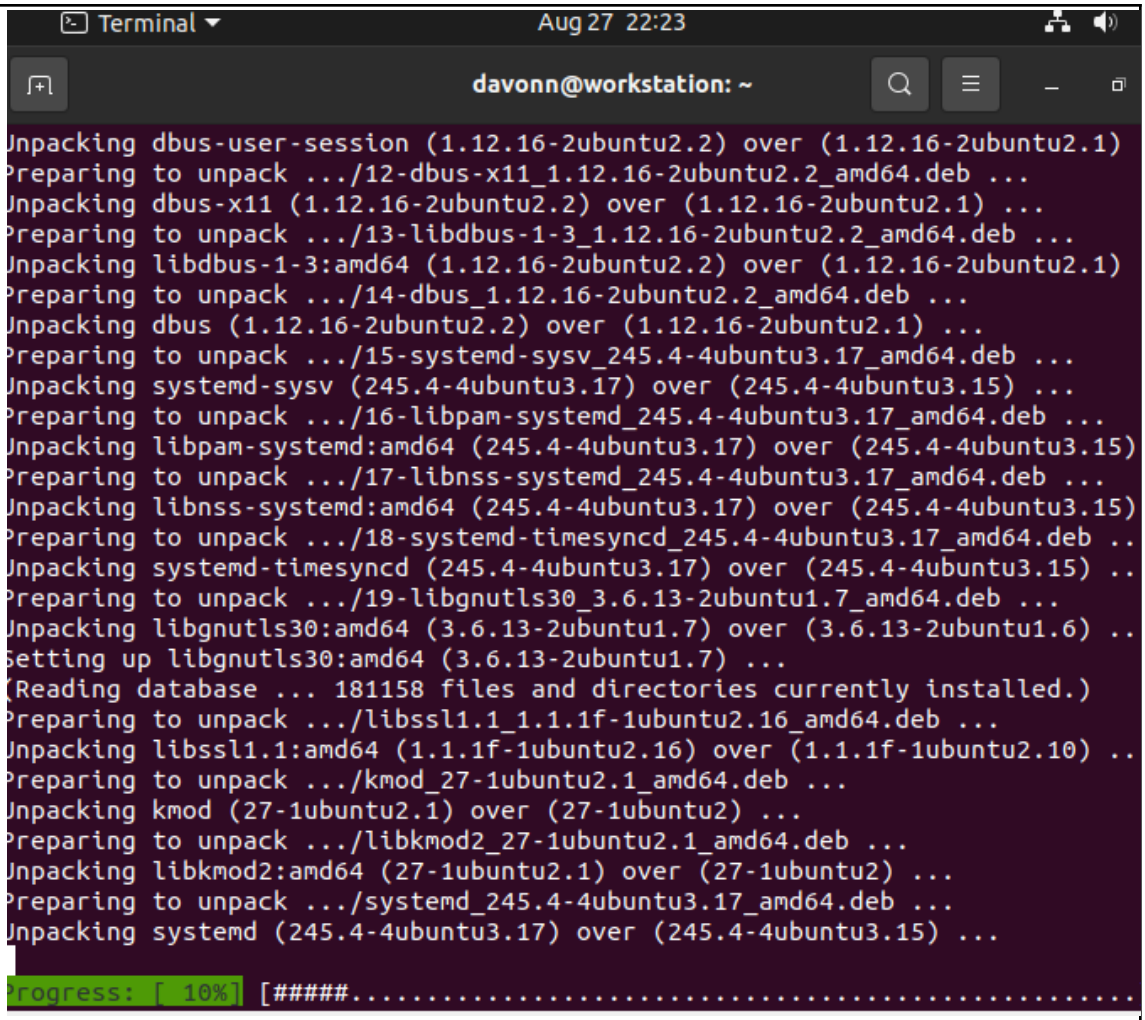




Workstation




davonn@workstation: ~
davonn@workstation:~$ sudo apt upgrade
[sudo] password for davonn:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
libfwupdplugin1
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
libfwupdplugin5 libopengl0
The following packages will be upgraded:
alsa-ucm-conf apport apport-gtk apt apt-utils base-files bash
bind9-dnsutils bind9-host bind9-libs bluez bluez-cups bluez-obexd bolt
ca-certificates command-not-found cpp-9 cups cups-bsd cups-client
cups-common cups-core-drivers cups-daemon cups-ipp-utils cups-ppdc
cups-server-common dbus dbus-user-session dbus-x11 dirmngr distro-info-data
dnsmasq-base dpkg firefox fonts-opensymbol fwupd fwupd-signed gcc-9-base
gir1.2-gdkpixbuf-2.0 gir1.2-gst-plugins-base-1.0 gir1.2-gstreamer-1.0
gir1.2-gtk-3.0 gir1.2-javascriptcoregtk-4.0 gir1.2-polkit-1.0
gir1.2-webkit2-4.0 gnome-control-center gnome-control-center-data
gnome-control-center-faces gnupg gnupg-l10n gnupg-utils gpg gpg-agent
gpg-wks-client gpg-wks-server gpgconf gpgsm gpgv gstreamer1.0-alsa
gstreamer1.0-gl gstreamer1.0-gtk3 gstreamer1.0-plugins-base
gstreamer1.0-plugins-base-apps gstreamer1.0-plugins-good
gstreamer1.0-pulseaudio gstreamer1.0-tools gstreamer1.0-x
gtk-update-icon-cache gvfs gvfs-backends gvfs-bin gvfs-common gvfs-daemons
gvfs-fuse gvfs-libs gzip iio-sensor-proxy intel-microcode isc-dhcp-client
isc-dhcp-common klibc-utils kmod libapt-pkg6.0 libarchive13 libbluetooth3



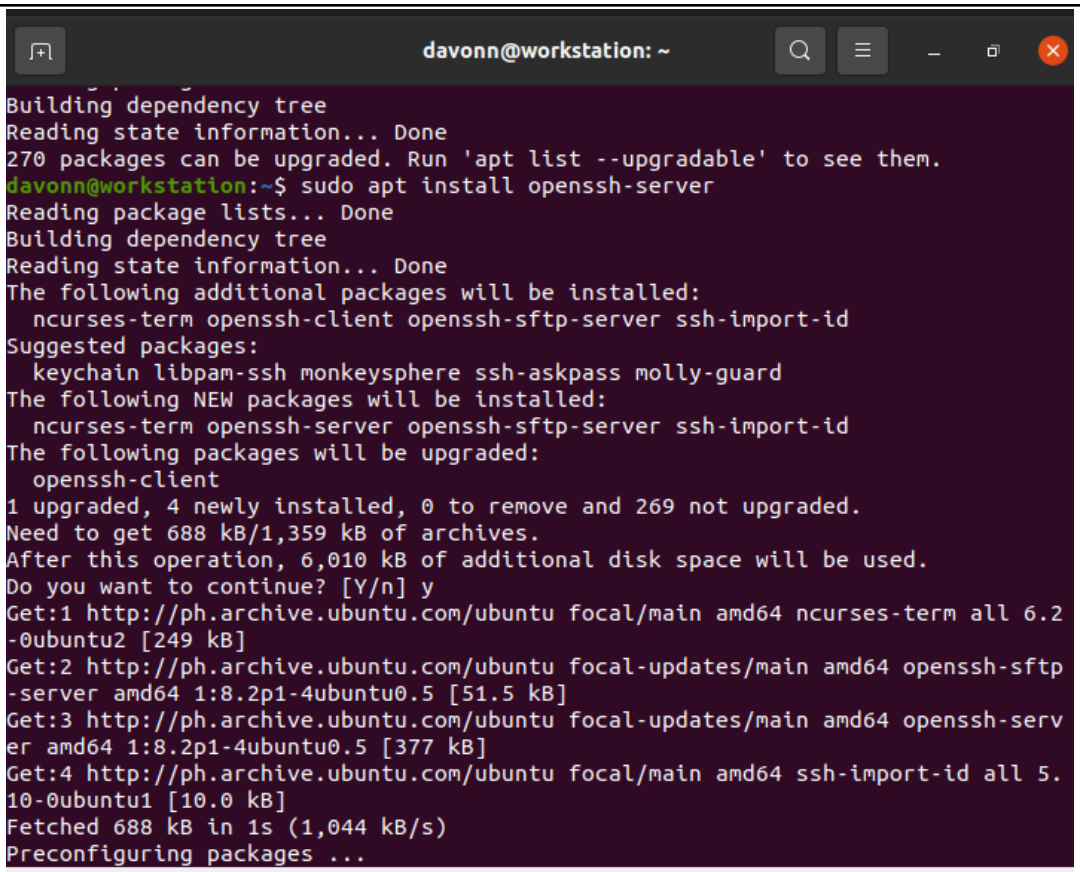
2. Install the SSH server using the command *sudo apt install openssh-server*.

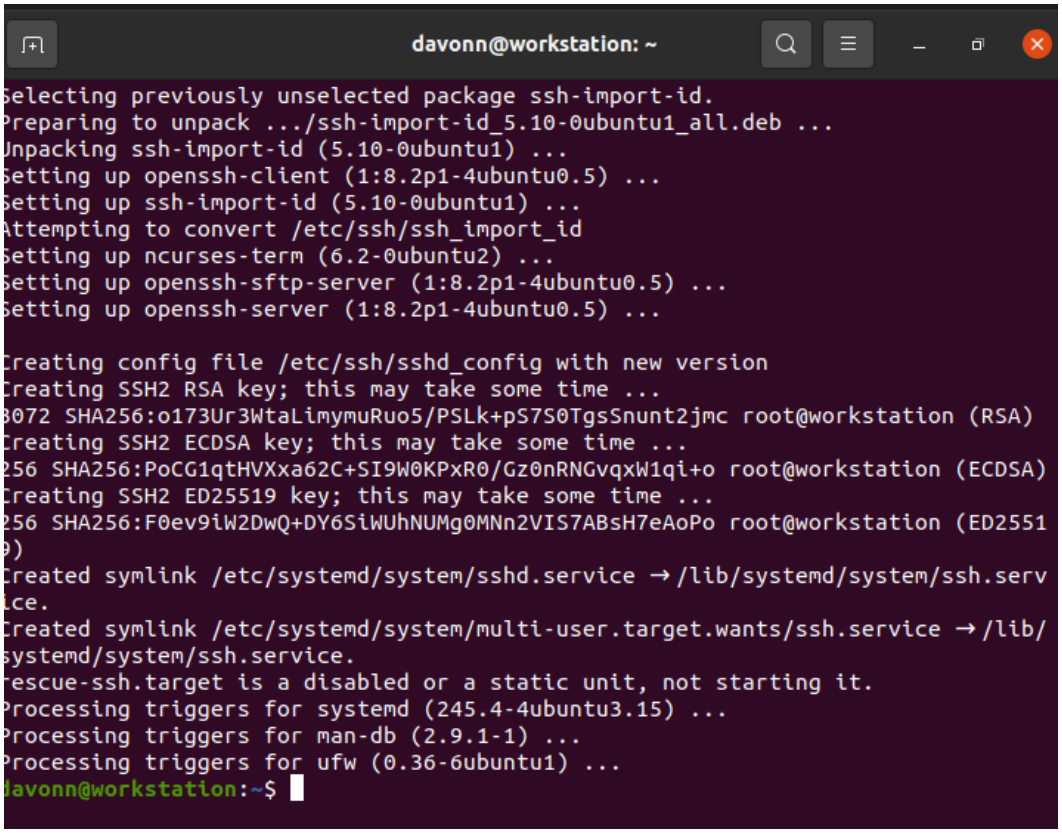
Server 1

```
davonn@davonn-VirtualBox:~$ sudo 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:
  libfwupdplugin1
Use 'sudo 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 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 688 kB of archives.
After this operation, 6,010 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ph.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2
-0ubuntu2 [249 kB]
Get:2 http://ph.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-sftp
-server amd64 1:8.2p1-4ubuntu0.5 [51.5 kB]
Get:3 http://ph.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-serv
er amd64 1:8.2p1-4ubuntu0.5 [377 kB]
Get:4 http://ph.archive.ubuntu.com/ubuntu focal/main amd64 ssh-import-id all 5.
10-0ubuntu1 [10.0 kB]
Fetched 688 kB in 1s (534 kB/s)
```

Server 2

```
davonn@davonn-VirtualBox:~$ sudo 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:
  libfwupdplugin1
Use 'sudo 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 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 688 kB of archives.
After this operation, 6,010 kB of additional disk space will be used.
After this operation, 6,010 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ph.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2
-0ubuntu2 [249 kB]
Get:2 http://ph.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-sftp
-server amd64 1:8.2p1-4ubuntu0.5 [51.5 kB]
Get:3 http://ph.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-serv
er amd64 1:8.2p1-4ubuntu0.5 [377 kB]
Get:4 http://ph.archive.ubuntu.com/ubuntu focal/main amd64 ssh-import-id all 5.
10-0ubuntu1 [10.0 kB]
Fetched 688 kB in 1s (551 kB/s)
```

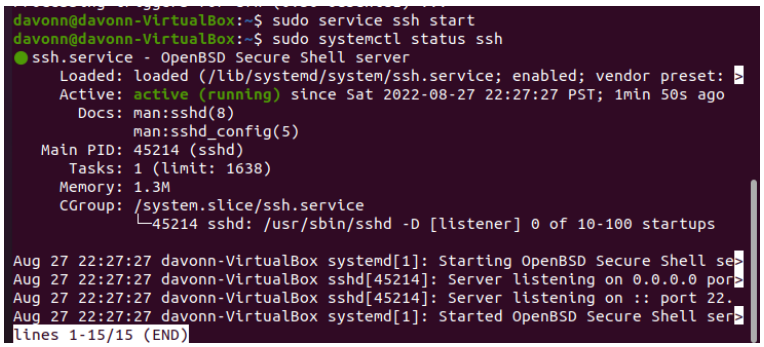

davonn@workstation: ~
Building dependency tree
Reading state information... Done
270 packages can be upgraded. Run 'apt list --upgradable' to see them.
davonn@workstation:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
ncurses-term openssh-client openssh-sftp-server ssh-import-id
Suggested packages:
keychain libpam-ssh monkeysphere ssh-askpass molly-guard
The following NEW packages will be installed:
ncurses-term openssh-server openssh-sftp-server ssh-import-id
The following packages will be upgraded:
openssh-client
1 upgraded, 4 newly installed, 0 to remove and 269 not upgraded.
Need to get 688 kB/1,359 kB of archives.
After this operation, 6,010 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ph.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2
-0ubuntu2 [249 kB]
Get:2 http://ph.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-sftp
-server amd64 1:8.2p1-4ubuntu0.5 [51.5 kB]
Get:3 http://ph.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-serv
er amd64 1:8.2p1-4ubuntu0.5 [377 kB]
Get:4 http://ph.archive.ubuntu.com/ubuntu focal/main amd64 ssh-import-id all 5.
10-0ubuntu1 [10.0 kB]
Fetched 688 kB in 1s (1,044 kB/s)
Preconfiguring packages ...


davonn@workstation: ~
Selecting previously unselected package ssh-import-id.
Preparing to unpack .../ssh-import-id_5.10-0ubuntu1_all.deb ...
Unpacking ssh-import-id (5.10-0ubuntu1) ...
Setting up openssh-client (1:8.2p1-4ubuntu0.5) ...
Setting up ssh-import-id (5.10-0ubuntu1) ...
Attempting to convert /etc/ssh/ssh_import_id
Setting up ncurses-term (6.2-0ubuntu2) ...
Setting up openssh-sftp-server (1:8.2p1-4ubuntu0.5) ...
Setting up openssh-server (1:8.2p1-4ubuntu0.5) ...
Creating config file /etc/ssh/sshd_config with new version
Creating SSH2 RSA key; this may take some time ...
3072 SHA256:o173Ur3WtaLimymuRuo5/PSLk+pS7S0TgsSnunt2jmc root@workstation (RSA)
Creating SSH2 ECDSA key; this may take some time ...
256 SHA256:PoCG1qtHVXxa62C+SI9W0KPxR0/Gz0nRNGvqxW1qi+o root@workstation (ECDSA)
Creating SSH2 ED25519 key; this may take some time ...
256 SHA256:F0ev9iW2DwQ+DY6SiWUhNUMg0MNn2VIS7ABsH7eAoPo root@workstation (ED2551
9)
Created symlink /etc/systemd/system/sshd.service → /lib/systemd/system/ssh.serv
ice.
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /lib/
systemd/system/ssh.service.
rescue-ssh.target is a disabled or a static unit, not starting it.
Processing triggers for systemd (245.4-4ubuntu3.15) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for ufw (0.36-6ubuntu1) ...
davonn@workstation:~$

3. Verify if the SSH service has started by issuing the following commands:

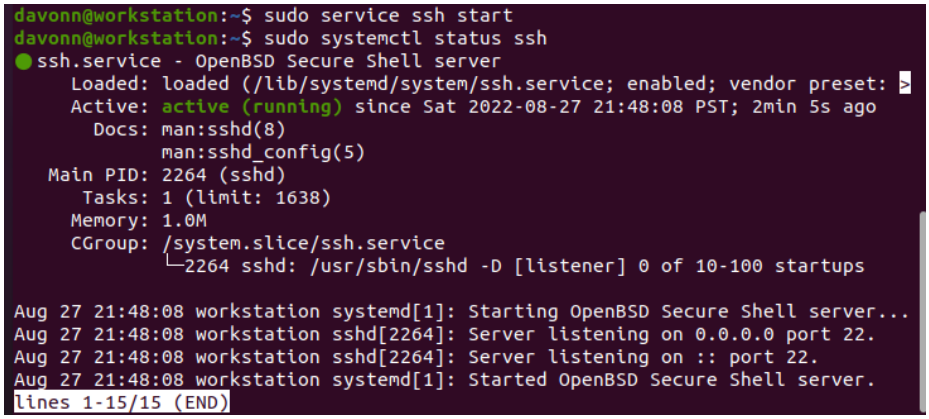
3.1 sudo service ssh start

Server 1



Server 2

Workstation



3.2 sudo systemctl status ssh

Server 1

```
davonn@davonn-VirtualBox:~$ sudo service ssh start
davonn@davonn-VirtualBox:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: >
     Active: active (running) since Sat 2022-08-27 22:27:27 PST; 1min 50s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 45214 (sshd)
      Tasks: 1 (limit: 1638)
     Memory: 1.3M
     CGroup: /system.slice/ssh.service
             └─45214 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Aug 27 22:27:27 davonn-VirtualBox systemd[1]: Starting OpenBSD Secure Shell se>
Aug 27 22:27:27 davonn-VirtualBox sshd[45214]: Server listening on 0.0.0.0 por>
Aug 27 22:27:27 davonn-VirtualBox sshd[45214]: Server listening on :: port 22.
Aug 27 22:27:27 davonn-VirtualBox systemd[1]: Started OpenBSD Secure Shell ser>
lines 1-15/15 (END)
```

Server 2

```
davonn@davonn-VirtualBox:~$ sudo service ssh start
davonn@davonn-VirtualBox:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: >
     Active: active (running) since Sat 2022-08-27 22:51:38 PST; 1min 43s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 45291 (sshd)
      Tasks: 1 (limit: 1638)
     Memory: 1.0M
     CGroup: /system.slice/ssh.service
             └─45291 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Aug 27 22:51:38 davonn-VirtualBox systemd[1]: Starting OpenBSD Secure Shell se>
Aug 27 22:51:38 davonn-VirtualBox sshd[45291]: Server listening on 0.0.0.0 por>
Aug 27 22:51:38 davonn-VirtualBox sshd[45291]: Server listening on :: port 22.
Aug 27 22:51:38 davonn-VirtualBox systemd[1]: Started OpenBSD Secure Shell ser>
lines 1-15/15 (END)
```

Workstation

```
davonn@workstation:~$ sudo service ssh start
davonn@workstation:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: >
     Active: active (running) since Sat 2022-08-27 21:48:08 PST; 2min 5s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 2264 (sshd)
      Tasks: 1 (limit: 1638)
     Memory: 1.0M
     CGroup: /system.slice/ssh.service
             └─2264 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Aug 27 21:48:08 workstation systemd[1]: Starting OpenBSD Secure Shell server...
Aug 27 21:48:08 workstation sshd[2264]: Server listening on 0.0.0.0 port 22.
Aug 27 21:48:08 workstation sshd[2264]: Server listening on :: port 22.
Aug 27 21:48:08 workstation systemd[1]: Started OpenBSD Secure Shell server.
lines 1-15/15 (END)
```

4. Configure the firewall to all port 22 by issuing the following commands:

   4.1 sudo ufw allow ssh

   Server 1

```
davonn@davonn-VirtualBox:~$ sudo ufw allow ssh
Rules updated
Rules updated (v6)
```

   Server 2

```
davonn@davonn-VirtualBox:~$ sudo ufw allow ssh
Rules updated
Rules updated (v6)
```

Workstation

```
davonn@workstation:~$ sudo ufw allow ssh
Rules updated
Rules updated (v6)
```

4.2 sudo ufw enable

Server 1

```
davonn@davonn-VirtualBox:~$ sudo ufw enable
Firewall is active and enabled on system startup
```

Server 2

```
davonn@davonn-VirtualBox:~$ sudo ufw enable
Firewall is active and enabled on system startup
```

Workstation

```
davonn@workstation:~$ sudo ufw enable
Firewall is active and enabled on system startup
```

4.3 sudo ufw status

Server 1

```
davonn@davonn-VirtualBox:~$ sudo ufw status
Status: active

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

Server 2

```
davonn@davonn-VirtualBox:~$ sudo ufw status
Status: active

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

Workstation

```
davonn@workstation:~$ sudo ufw status
Status: active

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

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: 192.168.56.102
   1.2 Server 2 IP address: 192.168.56.101
   1.3 Server 3 IP address: 192.168.56.103

2. Make sure that they can ping each other.
   2.1 Connectivity test for Local Machine 1 to Server 1: ✅ Successful ☐ Not Successful

```
davonn@workstation:~$ ping 192.168.56.102
PING 192.168.56.102 (192.168.56.102) 56(84) bytes of data.
64 bytes from 192.168.56.102: icmp_seq=1 ttl=64 time=0.029 ms
64 bytes from 192.168.56.102: icmp_seq=2 ttl=64 time=0.080 ms
64 bytes from 192.168.56.102: icmp_seq=3 ttl=64 time=0.039 ms
64 bytes from 192.168.56.102: icmp_seq=4 ttl=64 time=0.039 ms
```

   2.2 Connectivity test for Local Machine 1 to Server 2: ✅ Successful ☐ Not Successful

```
davonn@workstation:~$ ping 192.168.56.103
PING 192.168.56.103 (192.168.56.103) 56(84) bytes of data.
64 bytes from 192.168.56.103: icmp_seq=1 ttl=64 time=0.842 ms
64 bytes from 192.168.56.103: icmp_seq=2 ttl=64 time=0.419 ms
64 bytes from 192.168.56.103: icmp_seq=3 ttl=64 time=0.336 ms
64 bytes from 192.168.56.103: icmp_seq=4 ttl=64 time=0.375 ms
64 bytes from 192.168.56.103: icmp_seq=5 ttl=64 time=0.411 ms
```

2.3 Connectivity test for Server 1 to Server 2: ✅ Successful ☐ Not Successful

```
davonn@server1:~$ ping 192.168.56.101
PING 192.168.56.101 (192.168.56.101) 56(84) bytes of data.
64 bytes from 192.168.56.101: icmp_seq=1 ttl=64 time=0.547 ms
64 bytes from 192.168.56.101: icmp_seq=2 ttl=64 time=0.706 ms
64 bytes from 192.168.56.101: icmp_seq=3 ttl=64 time=0.399 ms
64 bytes from 192.168.56.101: icmp_seq=4 ttl=64 time=0.778 ms
```

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*

```
davonn@workstation:~$ ssh davonn@192.168.56.102
The authenticity of host '192.168.56.102 (192.168.56.102)' can't be established
.
ECDSA key fingerprint is SHA256:PoCG1qtHVXxa62C+SI9W0KPxR0/Gz0nRNGvqxW1qi+o.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '192.168.56.102' (ECDSA) to the list of known hosts.
davonn@192.168.56.102's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

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

0 updates can be applied immediately.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
*** System restart required ***

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
```

1.2 Enter the password for server 1 when prompted

```
davonn@workstation:~$ ssh davonn@192.168.56.102
The authenticity of host '192.168.56.102 (192.168.56.102)' can't be established
.
ECDSA key fingerprint is SHA256:PoCG1qtHVXxa62C+SI9W0KPxR0/Gz0nRNGvqxW1qi+o.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '192.168.56.102' (ECDSA) to the list of known hosts.
davonn@192.168.56.102's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
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```

1.3 Verify that you are in server 1. The user should be in this format user@server1. For example, *jvtaylar@server1*

```
davonn@workstation:~$ ssh davonn@192.168.56.102
davonn@192.168.56.102's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

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

0 updates can be applied immediately.

New release '22.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Sat Aug 27 23:04:40 2022 from 192.168.56.102
```

2. Logout of Server 1 by issuing the command *control + D.*

```
davonn@workstation:~$ logout
Connection to 192.168.56.102 closed.
```

3. Do the same for Server 2.

```
davonn@workstation:~$ ssh davonn@192.168.56.101
The authenticity of host '192.168.56.101 (192.168.56.101)' can't be established
.
ECDSA key fingerprint is SHA256:2GrHfYd+JWKtkDl+r/WQEx+ywiyqzyCFuw5GVn8Hn4Y.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '192.168.56.101' (ECDSA) to the list of known hosts.
davonn@192.168.56.101's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

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

0 updates can be applied immediately.

Your Hardware Enablement Stack (HWE) is supported until April 2025.

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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.
```
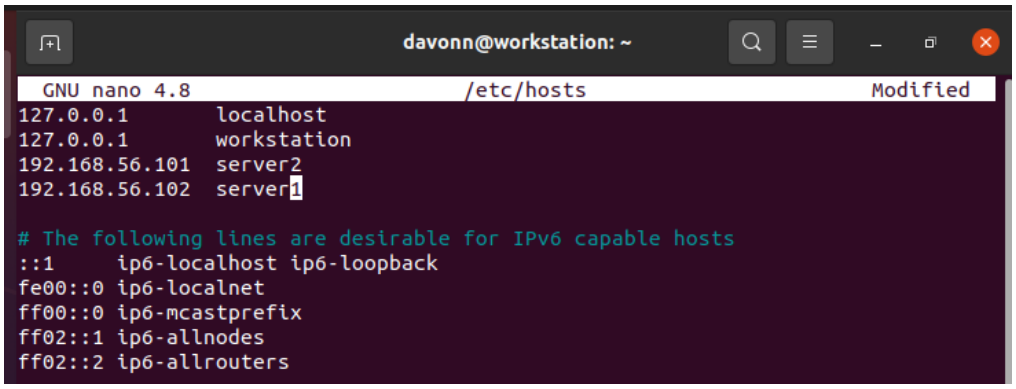
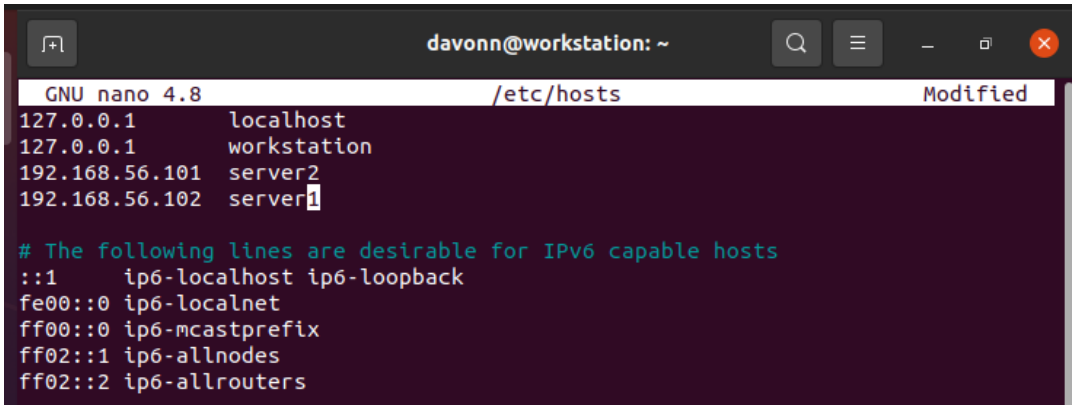

```
davonn@server2:~$ logout
Connection to 192.168.56.101 closed.
```

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.

```
davonn@workstation:~$ ssh davonn@server1
The authenticity of host 'server1 (192.168.56.102)' can't be established.
ECDSA key fingerprint is SHA256:PoCG1qtHVXxa62C+SI9W0KPxR0/Gz0nRNGvqxW1qi+o.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'server1' (ECDSA) to the list of known hosts.
davonn@server1's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

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

0 updates can be applied immediately.

New release '22.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Sat Aug 27 23:08:14 2022 from 192.168.56.102
davonn@workstation:~$ logout
Connection to server1 closed.
```

```
davonn@workstation:~$ ssh davonn@server2
The authenticity of host 'server2 (192.168.56.101)' can't be established.
ECDSA key fingerprint is SHA256:2GrHfYd+JWKtkDl+r/WQEx+ywiyqzyCFuw5GVn8Hn4Y.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added 'server2' (ECDSA) to the list of known hosts.
davonn@server2's password:
Welcome to Ubuntu 20.04.5 LTS (GNU/Linux 5.15.0-46-generic x86_64)

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

0 updates can be applied immediately.

New release '22.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Your Hardware Enablement Stack (HWE) is supported until April 2025.
Last login: Sat Aug 27 23:14:58 2022 from 192.168.56.102
davonn@server2:~$ logout
Connection to server2 closed.
```

Reflections:

Answer the following:

1. How are we able to use the hostname instead of IP address in SSH commands?
   We can be able to use the hostname because we can edit the host using the command sudo /etc/hosts then provide the ip address together with the hostname setted up on the other machines.
2. How secured is SSH?
   SSH is secure in a way that it uses keys to encrypt the data and also it delivers these through a secured channel.

I affirm that I shall not give or receive any unauthorized help on this exam and that all work shall be my own. - Davonn Escobilla