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Course/Section: CPE31S4	Date Submitted:08/15/23
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### Activity 1: Configure Network using Virtual Machines

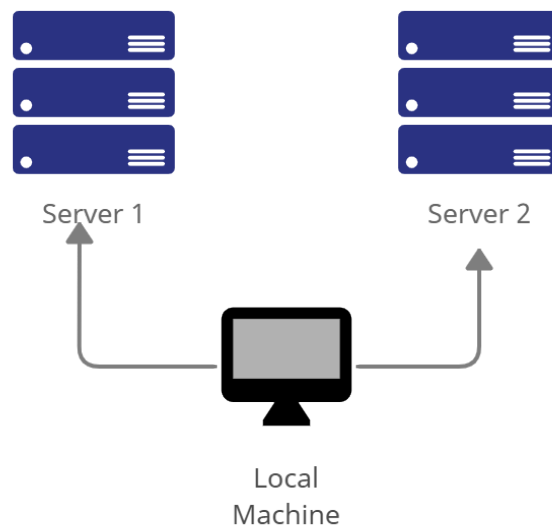
#### 1. Objectives:

- 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

```
micoflores@server1: ~  
GNU nano 6.2 /etc/hostname  
server1
```

1.2 Use server2 for Server 2

```
micoflores@server2: ~  
GNU nano 6.2 /etc/hostname  
server2
```

1.3 Use workstation for the Local Machine

```
micoflores@workstation: ~  
GNU nano 6.2 /etc/hostname  
workstation
```

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

```
micoflores@server1: ~  
GNU nano 6.2 /etc/hosts  
127.0.0.1 server 1
```

2.2 Type 127.0.0.1 server 2 for Server 2

```
micoflores@server2: ~  
GNU nano 6.2 /etc/hosts  
127.0.0.1 server 2
```

2.3 Type 127.0.0.1 workstation for the Local Machine

```
micoflores@workstation: ~  
GNU nano 6.2 /etc/hosts  
127.0.0.1 workstation
```

**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.

```
micoflores@workstation: ~  
Unpacking libreoffice-math (1:7.3.7-0ubuntu0.22.04.3) over (1:7.3.5-0ubuntu0.22.04.1) ...  
Preparing to unpack .../100-libreoffice-base-core_1%3a7.3.7-0ubuntu0.22.04.3_amd64.deb ...  
Unpacking libreoffice-base-core (1:7.3.7-0ubuntu0.22.04.3) over (1:7.3.5-0ubuntu0.22.04.1) ...  
Preparing to unpack .../101-libreoffice-draw_1%3a7.3.7-0ubuntu0.22.04.3_amd64.deb ...  
Unpacking libreoffice-draw (1:7.3.7-0ubuntu0.22.04.3) over (1:7.3.5-0ubuntu0.22.04.1) ...  
Preparing to unpack .../102-libreoffice-impress_1%3a7.3.7-0ubuntu0.22.04.3_amd64.deb ...  
Unpacking libreoffice-impress (1:7.3.7-0ubuntu0.22.04.3) over (1:7.3.5-0ubuntu0.22.04.1) ...  
Preparing to unpack .../103-libreoffice-core_1%3a7.3.7-0ubuntu0.22.04.3_amd64.deb ...  
Unpacking libreoffice-core (1:7.3.7-0ubuntu0.22.04.3) over (1:7.3.5-0ubuntu0.22.04.1) ...  
Preparing to unpack .../104-libreoffice-help-en-us_1%3a7.3.7-0ubuntu0.22.04.3_all.deb ...  
Unpacking libreoffice-help-en-us (1:7.3.7-0ubuntu0.22.04.3) over (1:7.3.5-0ubuntu0.22.04.1) ...  
Progress: [ 45%] [#####.....]
```

```
micoflores@server1: ~  
Preparing to unpack .../03-libldb2_2%3a2.4.4-0ubuntu0.22.04.2_a  
Unpacking libldb2:amd64 (2:2.4.4-0ubuntu0.22.04.2) over (2:2.4.  
Preparing to unpack .../04-libsmbclient_2%3a4.15.13+dfsg-0ubunt  
.  
Unpacking libsmbclient:amd64 (2:4.15.13+dfsg-0ubuntu1.2) over (  
untu0.2) ...  
Preparing to unpack .../05-samba-ls_2%3a4.15.13+dfsg-0ubuntu1  
Unpacking samba-ls:amd64 (2:4.15.13+dfsg-0ubuntu1.2) over (2:  
tu0.2) ...  
Preparing to unpack .../06-libwbclient0_2%3a4.15.13+dfsg-0ubunt  
.  
Unpacking libwbclient0:amd64 (2:4.15.13+dfsg-0ubuntu1.2) over (  
untu0.2) ...  
Preparing to unpack .../07-python-apt-common_2.4.0ubuntu2_all.d  
Unpacking python-apt-common (2.4.0ubuntu2) over (2.3.0ubuntu2.1  
Preparing to unpack .../08-distro-info-data_0.52ubuntu0.4_all.d  
Unpacking distro-info-data (0.52ubuntu0.4) over (0.52ubuntu0.1)  
Preparing to unpack .../09-python3-apt_2.4.0ubuntu2_amd64.deb .  
Unpacking python3-apt (2.4.0ubuntu2) over (2.3.0ubuntu2.1) ...  
Preparing to unpack .../10-language-selector-gnome_0.219.1_all.  
Unpacking language-selector-gnome (0.219.1) over (0.219) ...  
Preparing to unpack .../11-language-selector-common_0.219.1_all  
Progress: [ 21%] [#####.....]
```

```
es Terminal Aug 14 23:19
micoflores@server2: ~
Preparing to unpack .../02-libdrm-nouveau2_2.4.113-2~ubuntu0.22.04.1_amd64.deb .
..
Unpacking libdrm-nouveau2:amd64 (2.4.113-2~ubuntu0.22.04.1) over (2.4.110-1ubunt
u1) ...
Preparing to unpack .../03-libdrm-radeon1_2.4.113-2~ubuntu0.22.04.1_amd64.deb ..
.
Unpacking libdrm-radeon1:amd64 (2.4.113-2~ubuntu0.22.04.1) over (2.4.110-1ubuntu
1) ...
Preparing to unpack .../04-libgl1-amber-dri_21.3.9-0ubuntu1~22.04.1_amd64.deb ..
.
Unpacking libgl1-amber-dri:amd64 (21.3.9-0ubuntu1~22.04.1) over (21.3.7-0ubuntu1
) ...
Preparing to unpack .../05-libdrm-amdgpu1_2.4.113-2~ubuntu0.22.04.1_amd64.deb ..
.
Unpacking libdrm-amdgpu1:amd64 (2.4.113-2~ubuntu0.22.04.1) over (2.4.110-1ubuntu
1) ...
Preparing to unpack .../06-libdrm-intel1_2.4.113-2~ubuntu0.22.04.1_amd64.deb ...
Unpacking libdrm-intel1:amd64 (2.4.113-2~ubuntu0.22.04.1) over (2.4.110-1ubuntu1
) ...
Preparing to unpack .../07-libgl1-mesa-dri_23.0.4-0ubuntu1~22.04.1_amd64.deb ...
Unpacking libgl1-mesa-dri:amd64 (23.0.4-0ubuntu1~22.04.1) over (22.0.5-0ubuntu0.
1) ...
Progress: [ 7%] [####.....]
```

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

```
micoflores@server1:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are
```

```
micoflores@server2: ~
micoflores@server2:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are
```

```
es  Terminal Aug 14 23:33
micoflores@workstation: ~
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 234 bytes 25786 (25.7 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 234 bytes 25786 (25.7 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

micoflores@workstation:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer re
libflashrom1 libftdi1-2 libllvm13
```

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*

```
micoflores@server1: ~
Firefox Web Browser
ssh.service is disabled or a static unit, not starting it.
Setting up ssh-import-id (5.11-0ubuntu1) ...
Setting up ncurses-term (6.3-2ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
micoflores@server1:~$ sudo service ssh start
micoflores@server1:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-08-14 23:28:03 UTC; 1min 1s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 38071 (sshd)
     Tasks: 1 (limit: 2256)
    Memory: 1.7M
       CPU: 16ms
```

```
micoflores@server2: ~  
Setting up ncurses-term (6.3-2ubuntu0.1) ...  
Processing triggers for man-db (2.10.2-1) ...  
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...  
micoflores@server2:~$ sudo service ssh start  
micoflores@server2:~$ sudo systemctl status sshh  
Unit sshh.service could not be found.  
micoflores@server2:~$ sudo systemctl status ssh  
● ssh.service - OpenBSD Secure Shell server  
   Loaded: loaded (/lib/systemd/system/ssh.service; enable  
   Active: active (running) since Mon 2023-08-14 23:27:58  
     Docs: man:sshd(8)  
           man:sshd_config(5)  
  Main PID: 37734 (sshd)  
    Tasks: 1 (limit: 2256)  
  Memory: 1.7M  
    CPU: 16ms
```

```
ssh.socket is a disabled or a static unit, not starting it.
Setting up ssh-import-id (5.11-0ubuntu1) ...
Setting up ncurses-term (6.3-2ubuntu0.1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for ufw (0.36.1-4ubuntu0.1) ...
micoflores@workstation:~$ sudo service ssh start
micoflores@workstation:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-08-14 23:32:57 UTC; 1min 4s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 37638 (sshd)
     Tasks: 1 (limit: 2256)
    Memory: 1.7M
      CPU: 16ms
```

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*

```
micoflores@workstation: ~  
Aug 14 23:32:57 workstation systemd[1]: Started OpenBSD Secu  
~  
~  
~  
~  
~  
~  
~  
lines 1-16/16 (END)  
[1]+  Stopped                  sudo systemctl status ssh  
micoflores@workstation:~$ sudo ufw allow ssh  
Rules updated  
Rules updated (v6)  
micoflores@workstation:~$ sudo ufw enable  
Firewall is active and enabled on system startup  
micoflores@workstation:~$ sudo ufw status  
Status: active  
  
To          Action      From  
--          -  
22/tcp      ALLOW       Anywhere  
22/tcp (v6) ALLOW       Anywhere (v6)  
micoflores@workstation:~$
```





micoflores@server1: ~

```
CPU: 16ms
CGroup: /system.slice/ssh.service
└─38071 "sshd: /usr/sbin/sshd -D [listener] 0 c
Aug 14 23:28:03 server1 systemd[1]: Starting OpenBSD Secure
Aug 14 23:28:03 server1 sshd[38071]: Server listening on 0.0
Aug 14 23:28:03 server1 sshd[38071]: Server listening on ::
Aug 14 23:28:03 server1 systemd[1]: Started OpenBSD Secure S
lines 1-16/16 (END)
[1]+  Stopped                  sudo systemctl status ssh
micoflores@server1:~$ sudo ufw allow ssh
Rules updated
Rules updated (v6)
micoflores@server1:~$ sudo ufw enable
Firewall is active and enabled on system startup
micoflores@server1:~$ sudo ufw status
Status: active

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

```
microflores@server2: ~  
CPU: 16ms  
CGroup: /system.slice/ssh.service  
└─37734 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-10  
Aug 14 23:27:58 server2 systemd[1]: Starting OpenBSD Secure Shell s  
Aug 14 23:27:58 server2 sshd[37734]: Server listening on 0.0.0.0 po  
Aug 14 23:27:58 server2 sshd[37734]: Server listening on :: port 22  
Aug 14 23:27:58 server2 systemd[1]: Started OpenBSD Secure Shell se  
lines 1-16/16 (END)  
[1]+  Stopped                  sudo systemctl status ssh  
microflores@server2:~$ sudo ufw allow ssh  
Rules updated  
Rules updated (v6)  
microflores@server2:~$ sudo ufw enable  
Firewall is active and enabled on system startup  
microflores@server2:~$ 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: 192.168.56.105

192.168.56.105

1.2 Server 2 IP address: 192.168.56.106

192.168.56.106

1.3 Server 3 IP address: 192.168.56.104

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

```
micoflores@workstation: ~  
64 bytes from 192.168.56.105: icmp_seq=18 ttl=64 time=0.350  
64 bytes from 192.168.56.105: icmp_seq=19 ttl=64 time=0.278  
64 bytes from 192.168.56.105: icmp_seq=20 ttl=64 time=0.354  
64 bytes from 192.168.56.105: icmp_seq=21 ttl=64 time=0.306  
64 bytes from 192.168.56.105: icmp_seq=22 ttl=64 time=0.296  
64 bytes from 192.168.56.105: icmp_seq=23 ttl=64 time=0.279  
64 bytes from 192.168.56.105: icmp_seq=24 ttl=64 time=0.343  
64 bytes from 192.168.56.105: icmp_seq=25 ttl=64 time=0.443  
^Z  
[2]+  Stopped                  ping 192.168.56.105  
micoflores@workstation:~$ ping 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=0.339 m  
64 bytes from 192.168.56.105: icmp_seq=2 ttl=64 time=0.267 m  
64 bytes from 192.168.56.105: icmp_seq=3 ttl=64 time=0.321 m  
64 bytes from 192.168.56.105: icmp_seq=4 ttl=64 time=0.504 m  
64 bytes from 192.168.56.105: icmp_seq=5 ttl=64 time=0.875 m  
64 bytes from 192.168.56.105: icmp_seq=6 ttl=64 time=0.281 m  
64 bytes from 192.168.56.105: icmp_seq=7 ttl=64 time=0.435 m  
64 bytes from 192.168.56.105: icmp_seq=8 ttl=64 time=0.406 m
```

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

```
micoflores@workstation: ~  
64 bytes from 192.168.56.105: icmp_seq=33 ttl=64 time=0.377  
64 bytes from 192.168.56.105: icmp_seq=34 ttl=64 time=0.246  
64 bytes from 192.168.56.105: icmp_seq=35 ttl=64 time=0.312  
64 bytes from 192.168.56.105: icmp_seq=36 ttl=64 time=0.258  
64 bytes from 192.168.56.105: icmp_seq=37 ttl=64 time=0.322  
64 bytes from 192.168.56.105: icmp_seq=38 ttl=64 time=0.309  
64 bytes from 192.168.56.105: icmp_seq=39 ttl=64 time=0.360  
64 bytes from 192.168.56.105: icmp_seq=40 ttl=64 time=0.311  
^Z  
[3]+  Stopped                  ping 192.168.56.105  
micoflores@workstation:~$ ping 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=0.474 m  
64 bytes from 192.168.56.106: icmp_seq=2 ttl=64 time=0.345 m  
64 bytes from 192.168.56.106: icmp_seq=3 ttl=64 time=0.416 m  
64 bytes from 192.168.56.106: icmp_seq=4 ttl=64 time=0.322 m  
64 bytes from 192.168.56.106: icmp_seq=5 ttl=64 time=0.313 m  
64 bytes from 192.168.56.106: icmp_seq=6 ttl=64 time=0.324 m  
64 bytes from 192.168.56.106: icmp_seq=7 ttl=64 time=0.316 m  
64 bytes from 192.168.56.106: icmp_seq=8 ttl=64 time=0.348 m  
64 bytes from 192.168.56.106: icmp_seq=9 ttl=64 time=0.449 m  
64 bytes from 192.168.56.106: icmp_seq=10 ttl=64 time=0.312
```

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

```
UbuntuFlores S1 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal

micoflores@server1: ~

RX packets 480 bytes 60669 (60.6 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 145 bytes 19015 (19.0 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collision 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 426 bytes 43283 (43.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 426 bytes 43283 (43.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collision 0

micoflores@server1:~$ ping 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=0.564 ms
64 bytes from 192.168.56.106: icmp_seq=2 ttl=64 time=0.261 ms
64 bytes from 192.168.56.106: icmp_seq=3 ttl=64 time=0.289 ms
64 bytes from 192.168.56.106: icmp_seq=4 ttl=64 time=0.312 ms
64 bytes from 192.168.56.106: icmp_seq=5 ttl=64 time=0.228 ms
64 bytes from 192.168.56.106: icmp_seq=6 ttl=64 time=0.266 ms
64 bytes from 192.168.56.106: icmp_seq=7 ttl=64 time=0.303 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 jvtaylor@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, `jvtaylor@server1`

```
[4]+  Stopped                  ping 192.168.56.106
micoflores@workstation:~$ ssh micoflores@192.168.56.105
The authenticity of host '192.168.56.105 (192.168.56.105)' can't be est.
ED25519 key fingerprint is SHA256:BS4AYBpR/q8X27kYUcQj9ZGTxUsB9abzFAGkD
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.56.105' (ED25519) to the list of kn
```

```
micoflores@server1: ~  
micoflores@192.168.56.105's password:  
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-26-generic x86_64)  
  
 * Documentation:  https://help.ubuntu.com  
 * Management:    https://landscape.canonical.com  
 * Support:       https://ubuntu.com/advantage  
  
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  
  
*** System restart required ***  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.  
  
micoflores@server1:~$
```

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

```
micoflores@server1:~$  
logout  
Connection to 192.168.56.105 closed.  
micoflores@quekstation:~$
```

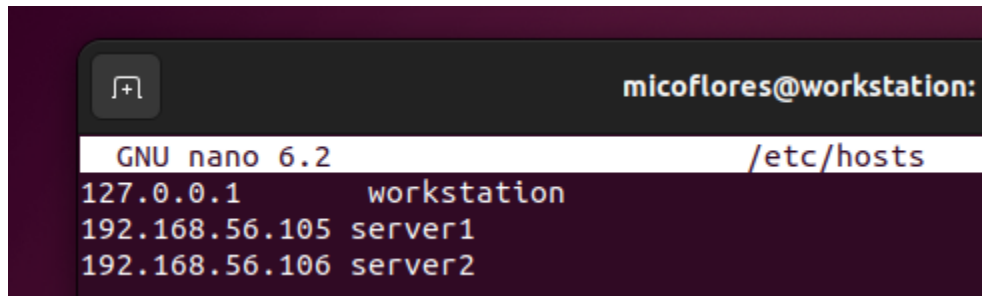
3. Do the same for Server 2.

```
micoflores@server2: ~  
  
micoflores@server1:~$  
micoflores@server1:~$  
logout  
Connection to 192.168.56.105 closed.  
micoflores@workstation:~$ ssh micoflores@192.168.56.106  
The authenticity of host '192.168.56.106 (192.168.56.106)' can  
ED25519 key fingerprint is SHA256:OGlgQqT+URqCCPLA2AkrOLYP7LAM  
This key is not known by any other names  
Are you sure you want to continue connecting (yes/no/[fingerprint])  
  
micoflores@server2: ~  
  
micoflores@192.168.56.106's password:  
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-26-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
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  
  
*** System restart required ***  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted  
by applicable law.  
  
micoflores@server2:~$
```

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.



```
micoflores@workstation: ~
GNU nano 6.2 /etc/hosts
127.0.0.1      workstation
192.168.56.105 server1
192.168.56.106 server2
```

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 jvtaylor@server1**. Enter the password when prompted. Verify that you have entered Server 1. Do the same for Server 2.





micoflores@server1: ~

```
micoflores@workstation:~$ ssh micoflores@server1
The authenticity of host 'server1 (192.168.56.105)' can't be
ED25519 key fingerprint is SHA256:BS4AYBpR/q8X27kYUcQj9ZGTxUs
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])?
Warning: Permanently added 'server1' (ED25519) to the list of
micoflores@server1's password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-26-generic x86_64)

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

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

*** System restart required ***
Last login: Tue Aug 15 00:00:58 2023 from 192.168.56.104
micoflores@server1:~$
```

```
mico@server2: ~  
mico@workstation:~$ ssh mico@server2  
The authenticity of host 'server2 (192.168.56.106)' can't be established.  
ED25519 key fingerprint is SHA256:OGlgQqT+URqCCPlA2AkrOLYP7LAmo1Waiu4hyUQXl  
This host key is known by the following other names/addresses:  
  ~/.ssh/known_hosts:4: [hashed name]  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'server2' (ED25519) to the list of known hosts.  
mico@server2's password:  
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-26-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
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  
  
*** System restart required ***  
Last login: Tue Aug 15 00:03:22 2023 from 192.168.56.104  
mico@server2:~$
```

### Reflections:

After doing the tasks in this manual, I have learned how to rename hosts, update each device, install necessary tools, identify IP addresses and access servers using a local machine or one host. In addition to this, I have learned how to operate and run ssh on each server and have access by just putting their hostname instead of IP addresses which makes it more convenient for the admin. This knowledge will be beneficial for us because this gives us skills to be a proper computer engineering student especially for our elective.

Answer the following:

1. How are we able to use the hostname instead of IP address in SSH commands?
  - I am able to use the hostname because I input the IP address followed by the name of server 1 in the /etc/hosts. In doing so, instead of typing the ip address, I can just type in "my\_user@server1" and it will connect to the server after entering the password. The same goes to server 2.

## 2. How secured is SSH?

- It provides strong encryption which makes it safe to protect the data transmission between the host and the server, and it will be difficult for any attackers to interrupt. It has a logging and monitoring if there are any suspicious unauthorized attempts in trying to access the servers.