Name: Dalena, Justin Miguel S.	Date Performed: 08/30/2024
Course/Section: CPE212 CPE31S22	Date Submitted: 08/30/2024
Instructor: Engr. Robin Valenzuela	Semester and SY: 1st Sem 2024-2025

Activity 1: Configure Network using Virtual Machines

1. **Objectives:**

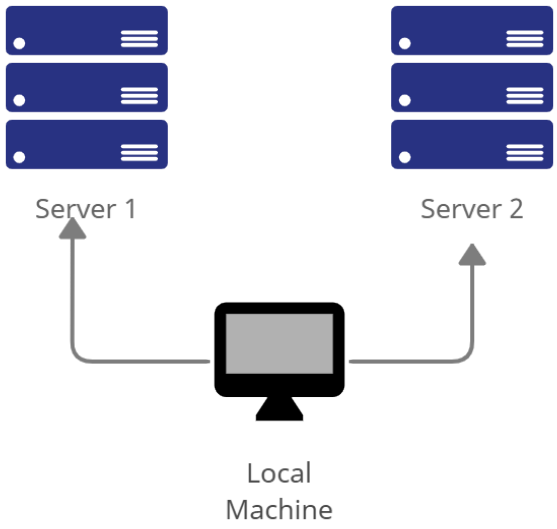
1.1. Create and configure Virtual Machines in Microsoft Azure or VirtualBox

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

2. **Discussion:**

Network Topology:

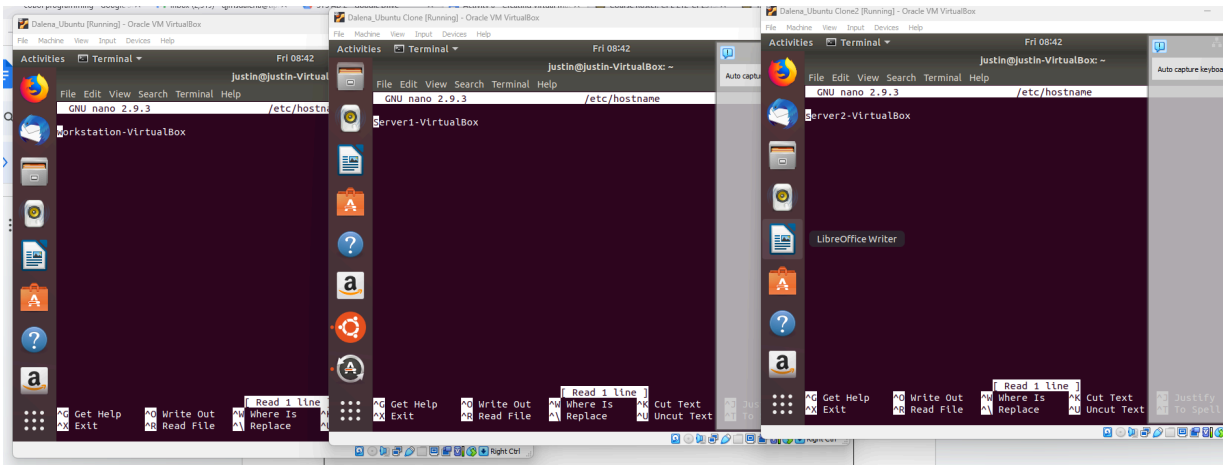
Assume that you have created the following network topology in Virtual Machines, *provide screenshots for each task*. (Note: *it is assumed that you have the prior knowledge of cloning and creating snapshots in a virtual machine*).

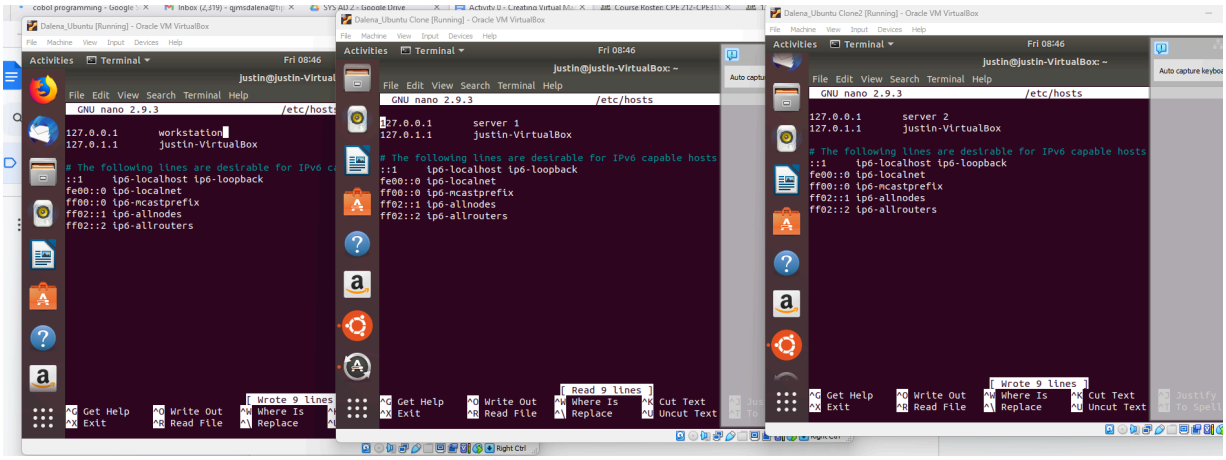


Task 1: Do the following on Server 1, Server 2, and Local Machine. In editing the file using nano command, press control + O to write out (save the file). Press enter when asked for the name of the file. Press control + X to end.

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.

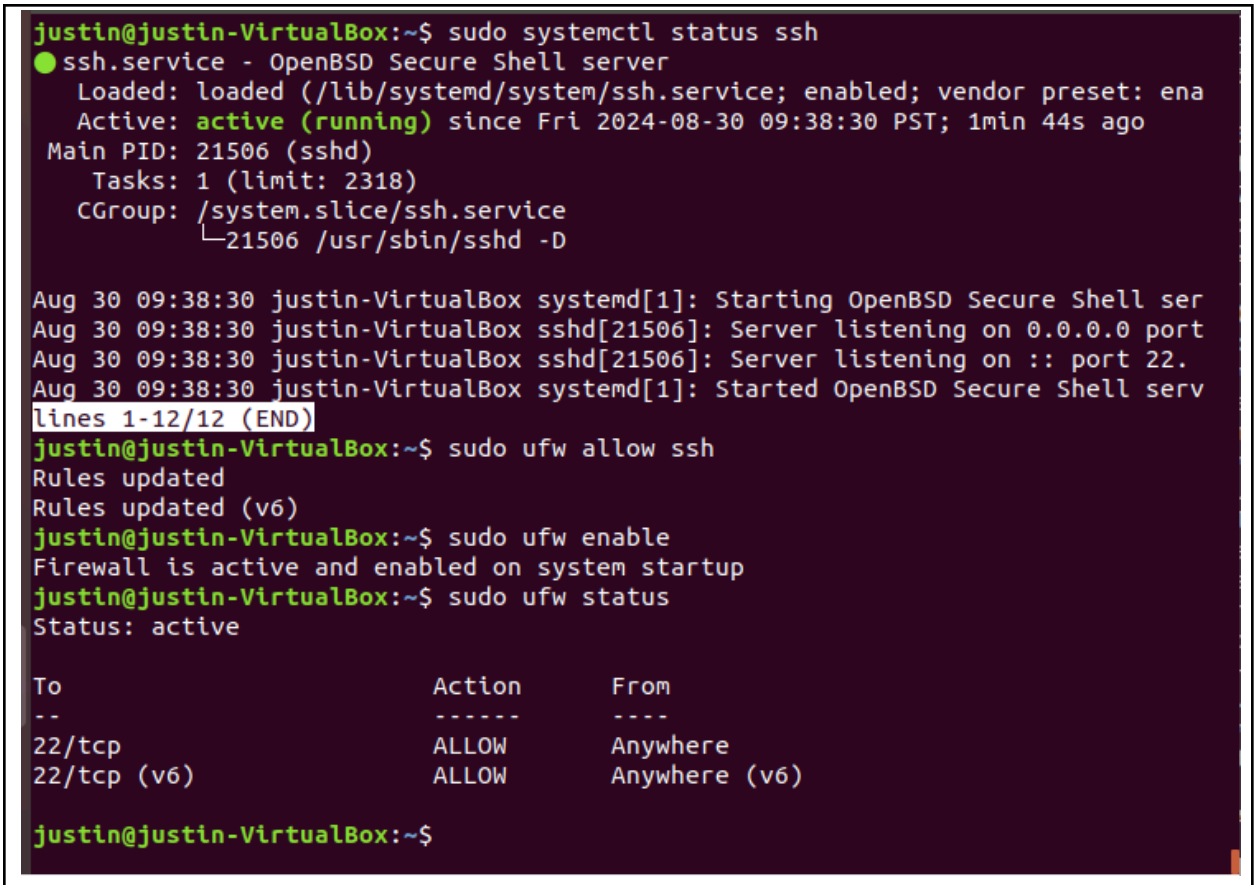
2.1 Type 127.0.0.1 server 1 for Server 1
2.2 Type 127.0.0.1 server 2 for Server 2
2.3 Type 127.0.0.1 workstation for the Local Machine





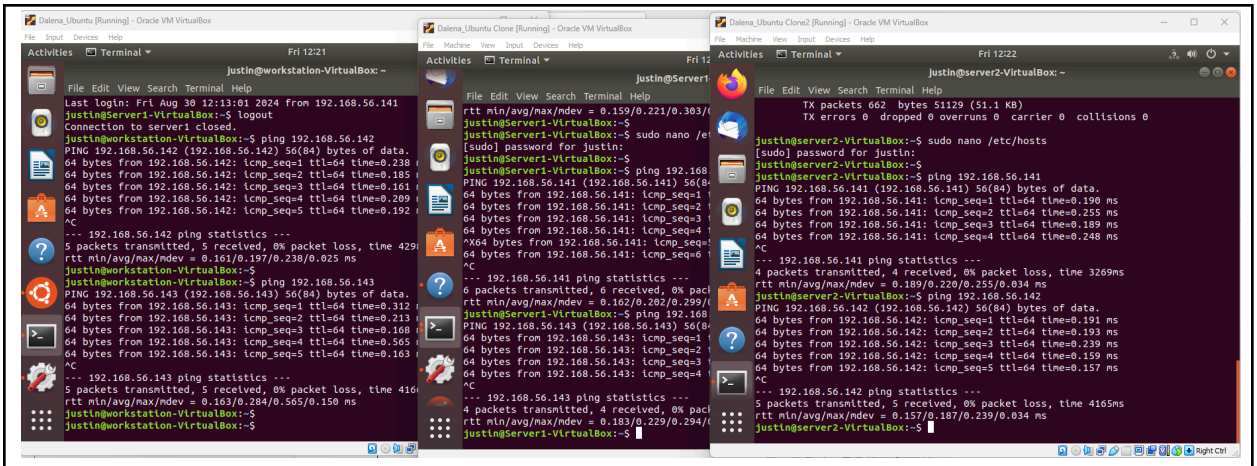
Task 2: Configure SSH on Server 1, Server 2, and Local Machine. Do the following:

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.___
   1.2 Server 2 IP address: 192.168.56.___
   1.3 Server 3 IP address: 192.168.56.___
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*

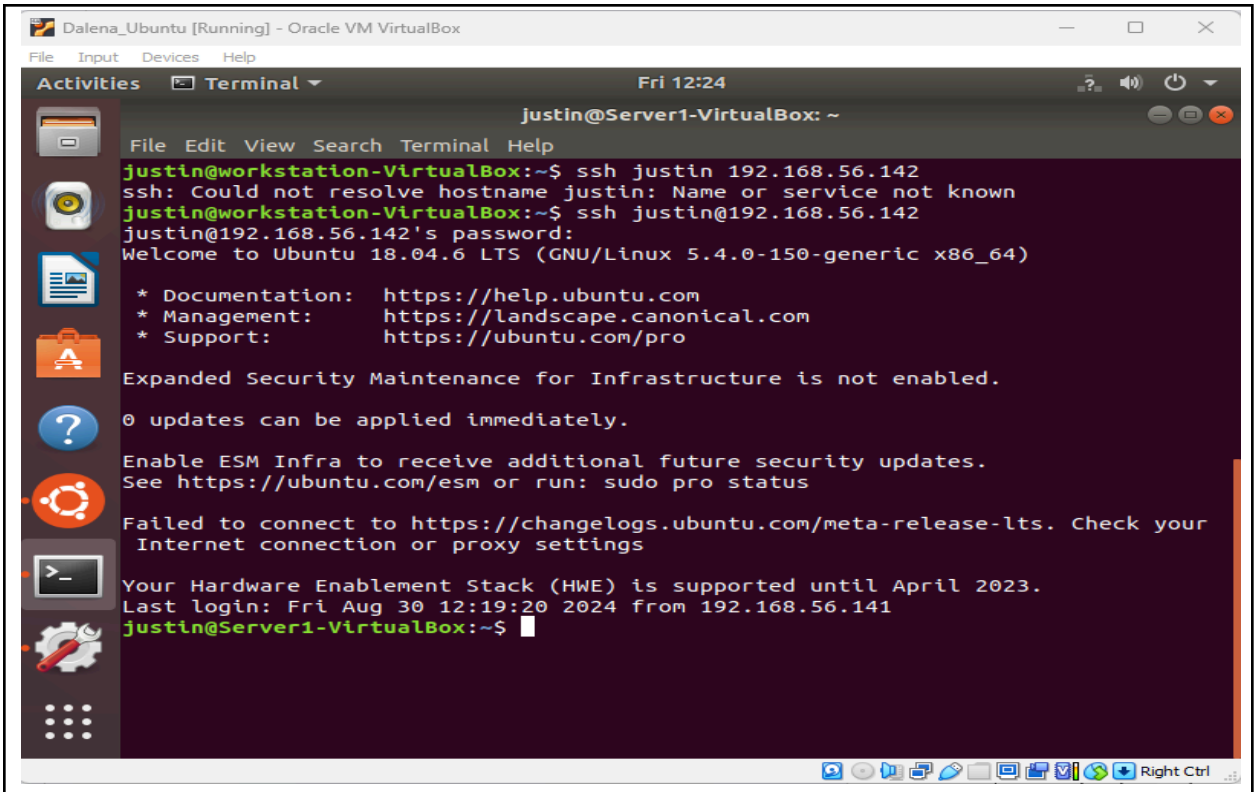
2. Logout of Server 1 by issuing the command *control + D.*
3. Do the same for Server 2.
4. Edit the hosts of the Local Machine by issuing the command *sudo nano /etc/hosts.* Below all texts type the following:

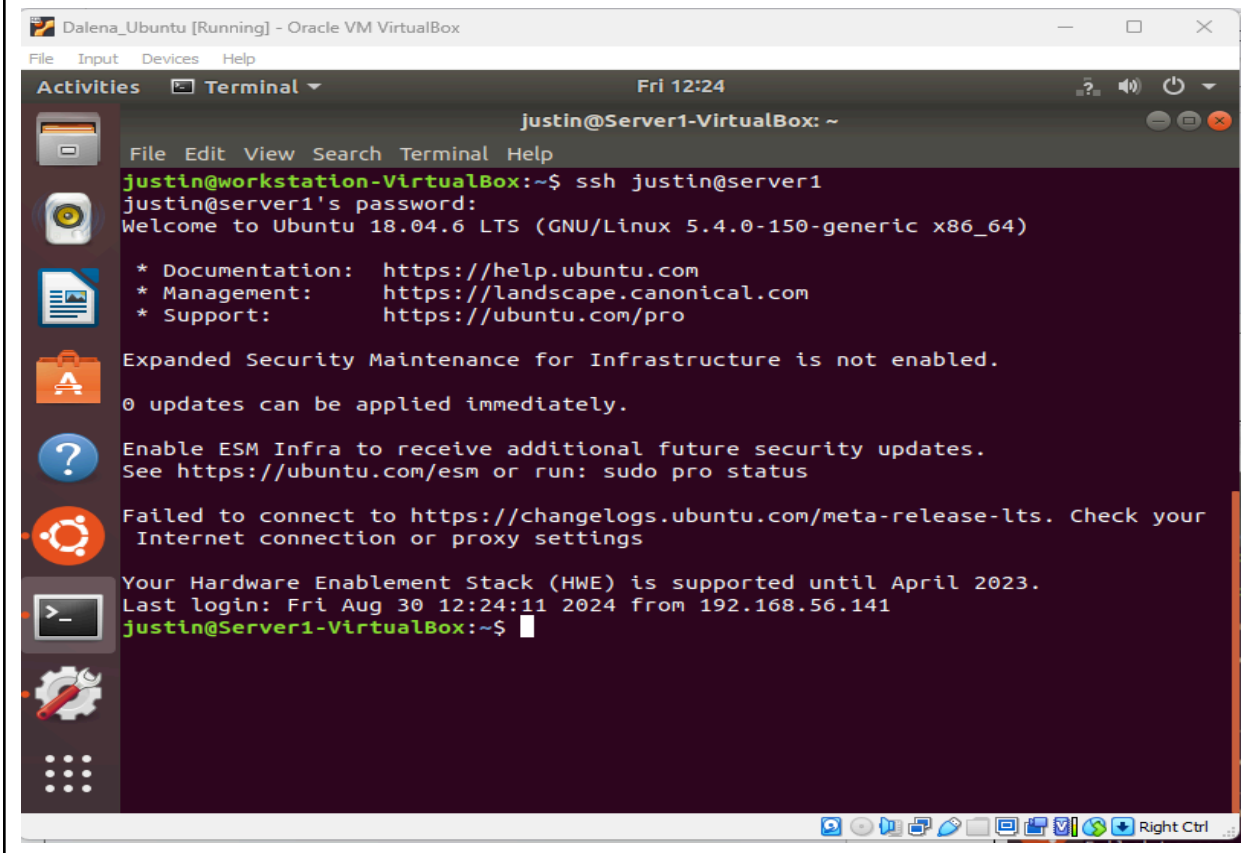
4.1 IP_address server 1 (provide the ip address of server 1 followed by the hostname)

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.


Dalena_Ubuntu [Running] - Oracle VM VirtualBox
File Input Devices Help
Activities Terminal Fri 12:24
justin@Server1-VirtualBox: ~
File Edit View Search Terminal Help
justin@workstation-VirtualBox:~$ ssh justin 192.168.56.142
ssh: Could not resolve hostname justin: Name or service not known
justin@workstation-VirtualBox:~$ ssh justin@192.168.56.142
justin@192.168.56.142'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.
Enable ESM Infra to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings
Your Hardware Enablement Stack (HWE) is supported until April 2023.
Last login: Fri Aug 30 12:19:20 2024 from 192.168.56.141
justin@Server1-VirtualBox:~$
Right Ctrl


Dalena_Ubuntu [Running] - Oracle VM VirtualBox
File Input Devices Help
Activities Terminal Fri 12:24
justin@Server1-VirtualBox: ~
File Edit View Search Terminal Help
justin@workstation-VirtualBox:~$ ssh justin@server1
justin@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.
Enable ESM Infra to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings
Your Hardware Enablement Stack (HWE) is supported until April 2023.
Last login: Fri Aug 30 12:24:11 2024 from 192.168.56.141
justin@Server1-VirtualBox:~$
Right Ctrl

Reflections:

Answer the following:

1. How are we able to use the hostname instead of IP address in SSH commands?
   - using the command “sudo nano /etc/hosts” I was able to edit and input the IP addresses of each server meaning i have associated the hostname to the ping. Making it able to access the machine using only the hostsname.
2. How secured is SSH?
   - SSH is "secure" because it incorporates encryption and authentication via a process called public key cryptography