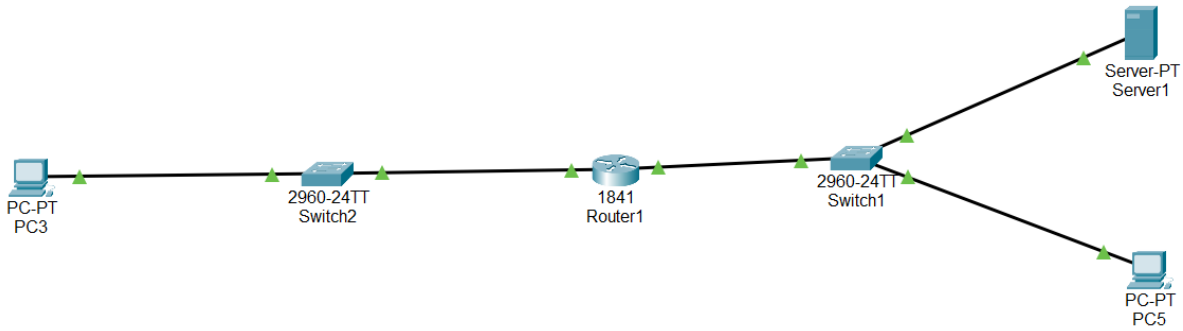
Coursework Portfolio 2

Sandbox application

Kolli bhavya sri

Student id: A00037677

1.NETWORK DIAGRAM



NOTE : I USE ADDITIONAL PC FOR CHECH AN APPLICATION SERVER FROM WEB BRWSER AND I ADDED A SWITCH FOR FUTURE ADDING PC AND SERVICES.

Steps:

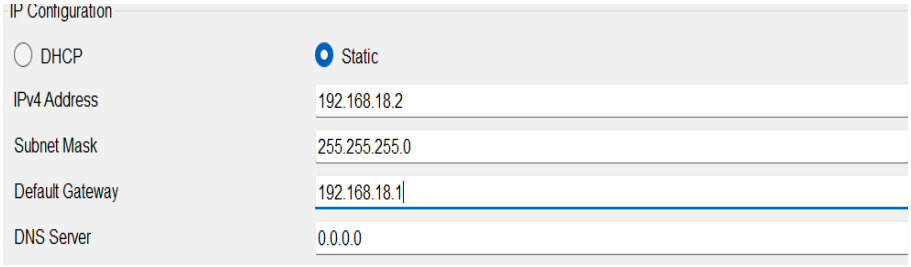
Gateway Router:

- Router1>enable
- Router1#configure terminal
- Router1(config)#interface fastethernet 0/0
- Router1(config-if)# ip address 192.168.18.1 255.0.0.0
- Router1(config-if)#no shutdown
- Router1(config-if)#exit

- Router1(config)#interface serial 0/1
- Router1(config -if)#ip address 192.168.118.1 255.0.0.0
- Router1(config-if)#no shutdown
- Router1(config-if)#exit

DESKTOP (PC):

- Click the pc and open it go to the desktop>IP Configuration > change to static>set IP address.



- Set all PC for this.
- And ping 192.168.18.1

APPLICATION SERVER:

- Click the application server and open it go to the desktop > IP configuration>change to static>set IP address.
- Click the application server and open it go to the service > Click HTTP >Turn ON HTTP and HTTPS > add HTML page in application server.
- Same Top Image But change IP to 192.168.118.2
- Click the application server and open it go to the desktop > Web Browser >Type the IP address 192.168.18.2

2. IP ADDRESS TABLE

Device	Role	IP Adress	Subnet mask
Desktop VM (Ubuntu Desktop)	Management	192.168.18.2	255.255.255.0
Gateway Router VM (enp0s3) (Ubuntu Server)	Internet Access	10.0.3.16	255.255.255.0
Gateway Router VM (enp08)	Subnet 01 – internet Network	192.168.18.1	255.255.255.0
Gateway Router VM (enp0s9) (Ubuntu Server)	Subnet 02- Internet Network	192.168.118.1	255.255.255.0
Application Server VM (Bitname)	server	192.168.118.2	255.255.255.0

3. GIT PAGES LAB REPORT

Github Project link - **https://bhavya-143.github.io/Bhavyasri-sandbox/**

Github File Link - https://github.com/bhavya-143/Bhavyasri-sandbox.git

Configuration Steps:

You need to create three VM mechine's for this project.

- Download the virtual box and install in your PC.
- Download the three OS for project.
    - Ubuntu Desktop (.iso format) or our Desktop OS like (kali linux,windows)
    - Ubuntu server OS (.iso format).
    - Appiication server in Bitnami Wordpress(.ova format).

Add three OS in virtual box.

Ubuntu Server OS configuration steps:

Step 1: create a new virtual machine (VM) for ubuntu server

Open virtualbox.

Click on new to create a new virtual machine.

Name the VM

Select the type as linux and the version as ubuntu(64-bit).

Allocate memory (RAM) for the VM (e.g.,2048 MB or higher based on your system's capacity).

Choose to create a virtual hard bisk now and set a sufficient disk size(e.g., 10GB).

Click create.

Step 2 :configure the network interfaces

You need two network interface on the Ubuntu server VM to act as a router between the two subnets.

- Go to settings of your new VM.
- Select network.

Adapter 1: set to internal network (name it differently, e.g., intnet).This will be your subnet.

1.click the advanced tab and set the adapter type to PCnet- FAST or another supported type. Note: within the ubuntu server terminal, this card will typically have a network adapter name of enp0s8.

Adapter 2 : Enable this adapter and set it to another internal network (name it differently, e.g., intent 1).this will be for subnet 2 within the ubuntu server terminal, this card will typically have a network adapter name of enp0s9.

Adapter 3 :set to NAT . Note :within the ubuntu server terminal, this card will typically have a network adapter name of enp0s3.its IP address will be assigned via DHCP . it will be used to provide access to the internet via the host computer.

Step 3: install Ubuntu server

State the VM and select the Ubuntu server ISO as the boot disk.

Go through the installation process:

Set your time zone, keyboard layout, etc.

When asked, select the option to install OpenSSH server (to enable remote access later if needed).

Complete the installation, then reboot the VM.

Step 4: configure static Ips on the network interfaces

After installation, you'll need to assign static IP addresses to both network interface(each in different subnets).

Log in to the Ubuntu server VM.

Edit the network configuration file:

- Sudo nano/etc/netplan/00-installer-config.yaml

Type this code.

```
network:
  ethernets:
    enp0s3:
      dhcp4: true
    enp0s8:
      addresses:
        - 192.168.18.1/24
      dhcp4: false
    enp0s9:
      addresses:
        - 192.168.118.1/24
      dhcp4: false
  version: 2
```

Save it (CTRL+X) type(yes) and enter.

Apply the network changes

- Sudo netplan apply
- Ip a

Step 5: enable IP forwording

To allow routing between the two subnets,you need to enable IP forwording.

Open the sysctl configuration file:

- Sudo nano/etc/sysctl.conf

Uncomment the line (or add it if not present):

- Net.ipv4.ip_forword=1

Apply the changes:

- Sudo sysctl -p

Step 6: set up IP table for routing

You may also want to configure iptables to ensure packet are foeworded between the subnets.

Configured iptables to allows forwording:

- Sudo iptables -A FORWORD – I enp0s3 -o enp0s8 -j ACCEPT
- Sudo iptables – A FORWORD -I enp0s8 –o enp0s3 -j ACCEPT

To make the changes permanent, you can save the iptables rules:

- Sudo apt install iptables -persistent
- Sudo netfilter- persistent save
- Sudo netfilter- persistent reload

Ubuntu OS configuration Steps:

Step 1: installing Ubuntu Desktop in VM

To create a virtual machine and install a GUI -based OS from an ISO file

Launch virtual box

Click “New” to create a new machine

Fill in the details as requested so that the new machine is:

- Name “ubuntu desktop”
- The ISO name “ubuntu-24.04.1 – desktop-amd64.iso” is selected
- The checkbox for “skip unattended installation” is checked.

Click “Next”. Now ensure the machine has:

- 2048mb of base memory
- Two processors

Click “next” create a virtual hard disk for the machine. This will need to be a minimum of 25GB

Click “next”. Verify your settings are as above and click “finish”.

Click “install ubuntu”

You need to create an ubuntu account and click a restart now.

Step 2: configure the network interfaces:

You need one network interfaces on the ubuntu desktop VM.

Go to setting of your new VM

Select Network.

Adapter1: set to interface network (name it differently, e.g., intnet).

Open ubuntu desktop in VM and login.

Go to setting >network>enp0s3 setting> IPV4 >IPV4 method change (manual)> Add address=192.168.18.2, add netmask= 255.255.255.0 , add gateway =192. 168.18.1 click Apply.

BITNAMI WEB APPLICATION CONFIGURATION STEP:

To create a bitnami virtual machine using virtual box

Step 1: install bitnami application in VM.

Click “file” the “import application”.

Navigate to the file name “bitnami -wordptress-6.3.1- r0 – dedian-11-amd64.ova”

Click “open”.

Click” Next”

Click” finish”

Click ”start” to launch the machine.

The first- time log in details is display on- screen. You will be required to reset the password on your first log in.

Close the bitnami.

Step 2: configure the network interface

Go to settinh of your new VM.

Select network.

Adapter 1 :

set to interface network

Open bitnami application in VM and login.

Type the code

- Sudo nano/etc/network/interfaces
  Auto enp0s3
  face enp0s3 inet static
    Address 192.168.118.2
    Netmask 255.255.255.0
    Gateway 192.168.118.1
- Save it (CTRL +X) type (yes) and enter.
- Sudo ifdown enp0s3 && sudo ifup enp0s3
- Sudo systemctl restart networking
- Ip a

4.FUNCTION TEST RESULTS

Evidence that all VMs can communicate as per the design.

Ubuntu Server OS:

Network IP configuration For Ubuntu Server.

```
bhavyasri@bhavyasri:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000
    link/ether 08:00:27:bf:2a:d5 brd ff:ff:ff:ff:ff:ff
    inet 192.168.18.1/24 brd 192.168.18.255 scope global enp0s8
       valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:febf:2ad5/64 scope link
       valid_lft forever preferred_lft forever
3: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000
    link/ether 08:00:27:91:3c:65 brd ff:ff:ff:ff:ff:ff
    inet 192.168.118.1/24 brd 192.168.118.255 scope global enp0s9
       valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fe91:3c65/64 scope link
       valid_lft forever preferred_lft forever
4: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:98:86:03 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 metric 100 brd 10.0.2.255 scope global dynamic enp0s3
       valid_lft 86292sec preferred_lft 86292sec
    inet6 fd00::a00:27ff:fe98:8603/64 scope global dynamic mngtmpaddr noprefixroute
       valid_lft 86295sec preferred_lft 14295sec
    inet6 fe80::a00:27ff:fe98:8603/64 scope link
       valid_lft forever preferred_lft forever
bhavyasri@bhavyasri:~$
```

Ping Ubuntu Server to Ubuntu Desktop Using IP address 192.168.18.2.

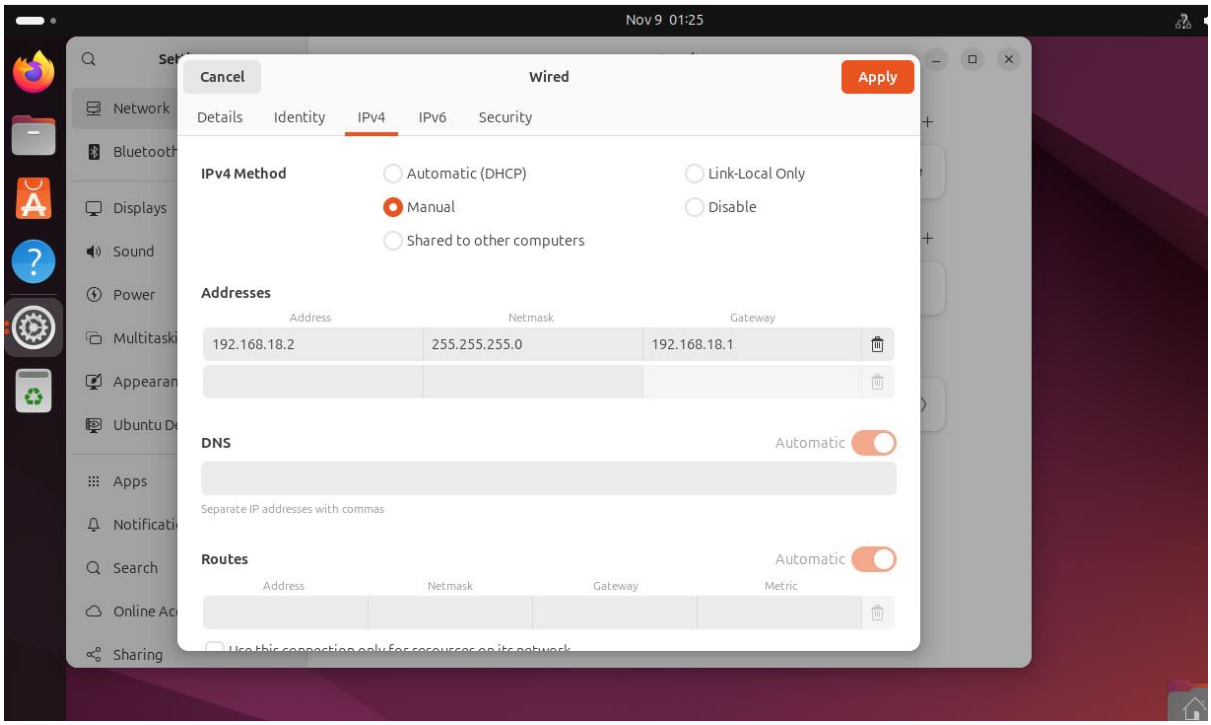
```
bhavyasri@bhavyasri:~$ ping 192.168.18.2
PING 192.168.18.2 (192.168.18.2) 56(84) bytes of data.
64 bytes from 192.168.18.2: icmp_seq=1 ttl=64 time=1.41 ms
64 bytes from 192.168.18.2: icmp_seq=2 ttl=64 time=1.39 ms
64 bytes from 192.168.18.2: icmp_seq=3 ttl=64 time=1.32 ms
64 bytes from 192.168.18.2: icmp_seq=4 ttl=64 time=1.50 ms
64 bytes from 192.168.18.2: icmp_seq=5 ttl=64 time=1.19 ms
C64 bytes from 192.168.18.2: icmp_seq=6 ttl=64 time=1.26 ms
^C
--- 192.168.18.2 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5013ms
rtt min/avg/max/mdev = 1.190/1.346/1.501/0.102 ms
```

Ping Ubuntu Server to Bitnami Application Server Using IP address 192.168.118.2.

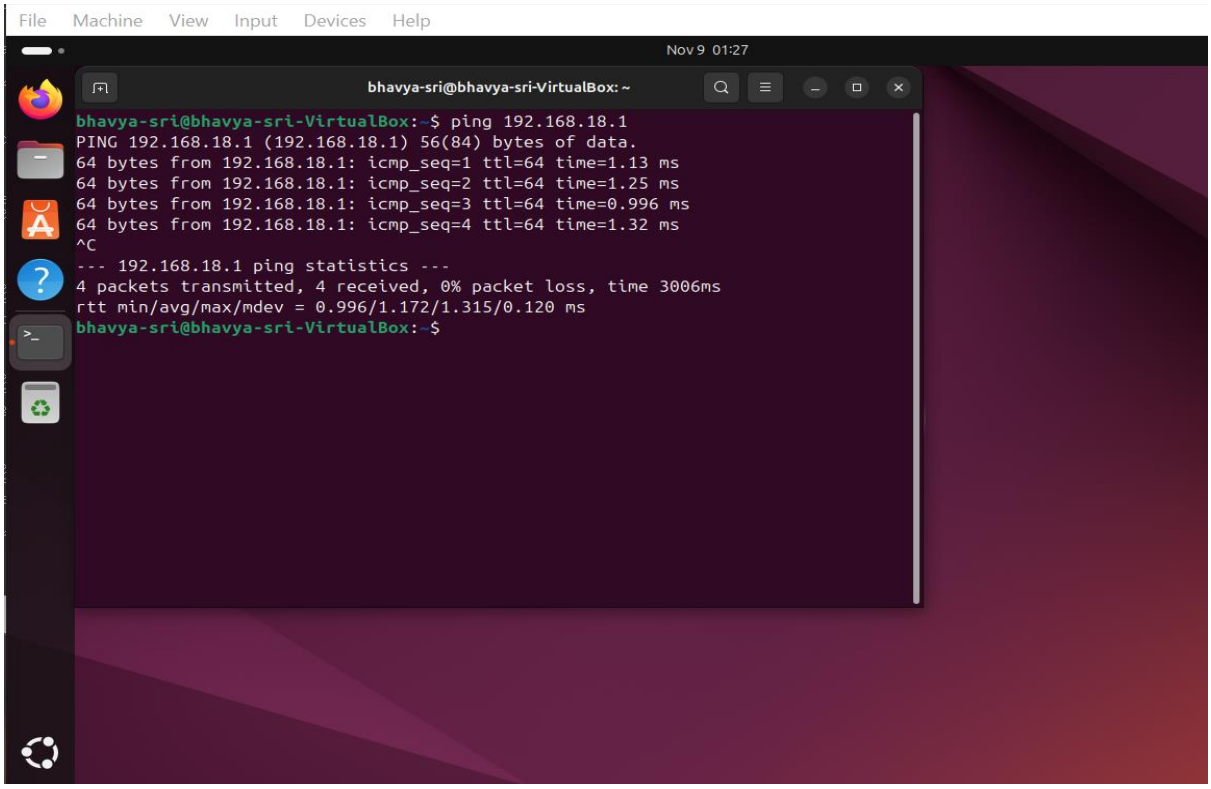
```
bhavyasri@bhavyasri:~$ ping 192.168.118.2
PING 192.168.118.2 (192.168.118.2) 56(84) bytes of data.
64 bytes from 192.168.118.2: icmp_seq=1 ttl=64 time=1.75 ms
64 bytes from 192.168.118.2: icmp_seq=2 ttl=64 time=1.59 ms
64 bytes from 192.168.118.2: icmp_seq=3 ttl=64 time=1.47 ms
64 bytes from 192.168.118.2: icmp_seq=4 ttl=64 time=1.08 ms
64 bytes from 192.168.118.2: icmp_seq=5 ttl=64 time=1.25 ms
^C
--- 192.168.118.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4012ms
rtt min/avg/max/mdev = 1.078/1.427/1.752/0.239 ms
bhavyasri@bhavyasri:~$
```

Ubuntu Desktop OS:

Network IP configuration For Ubuntu Desktop.

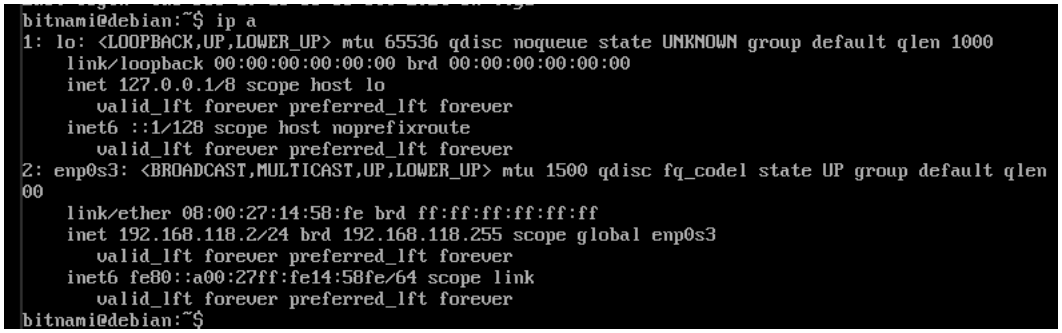


Ping Ubuntu Desktop to Ubuntu Server Using IP address 192.168.18.1.

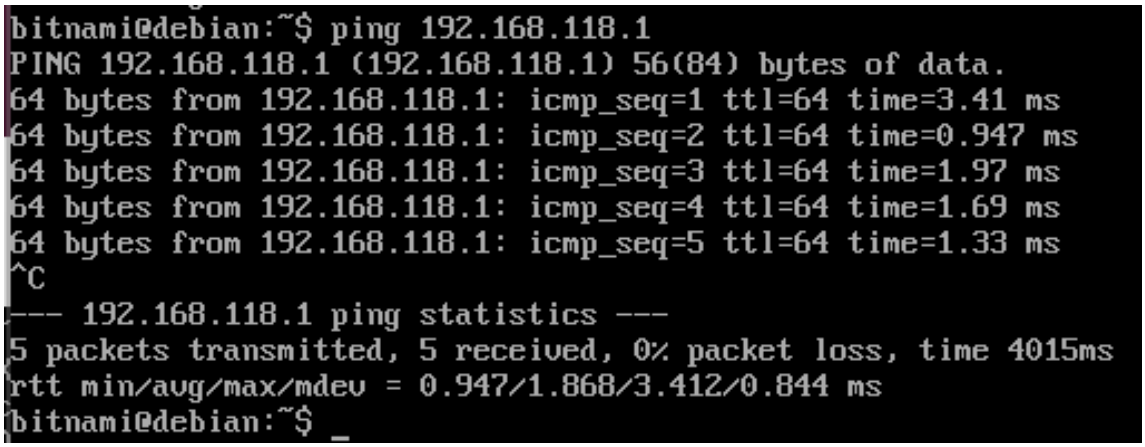


Bitnami Application Server:

Network IP configuration For Bitnami Application Server.



Ping Bitnami Application Server to Ubuntu Server Using IP address 192.168.118.1.



The Demo Video Youtube link - https://youtu.be/cVIimRIDabI