CYSE 270: Linux System for Cybersecurity

Lab 12 – Advanced Network configurations

Scenario: You, as a network admin, are going to set up your Ubuntu VM as a gateway to provide Internet access to another client Ubuntu VM. The client VM needs to be in the same internal network as the gateway (**as shown in Figure 1**). Once the connection is ready, you need to configure the firewall to secure the network properly. The following requirements need to be satisfied to receive full credits.

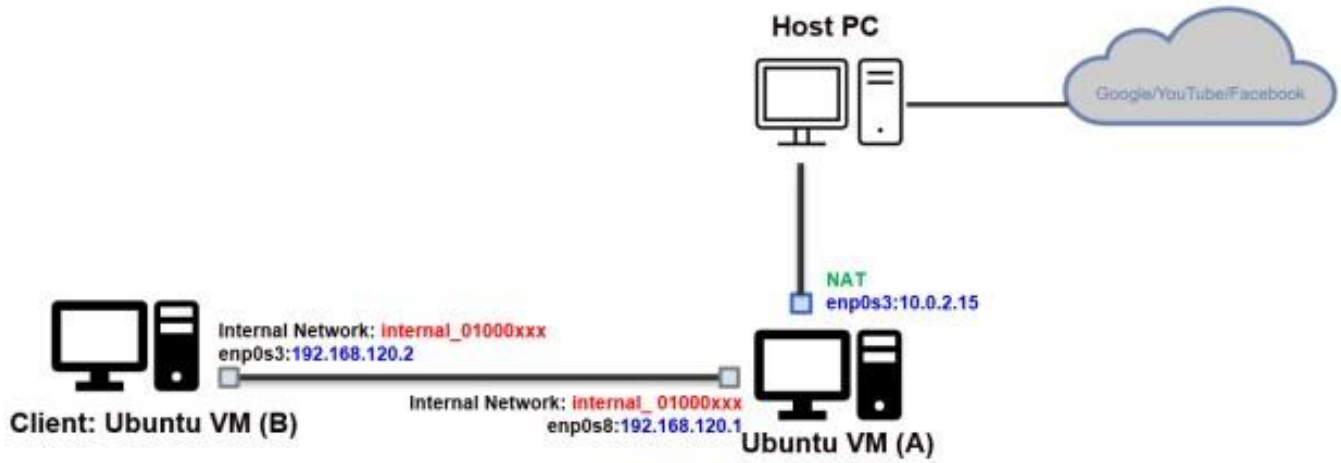


Figure 1 Desired Network Topology

Please note that you need to customize the value in the fields marked in RED above.

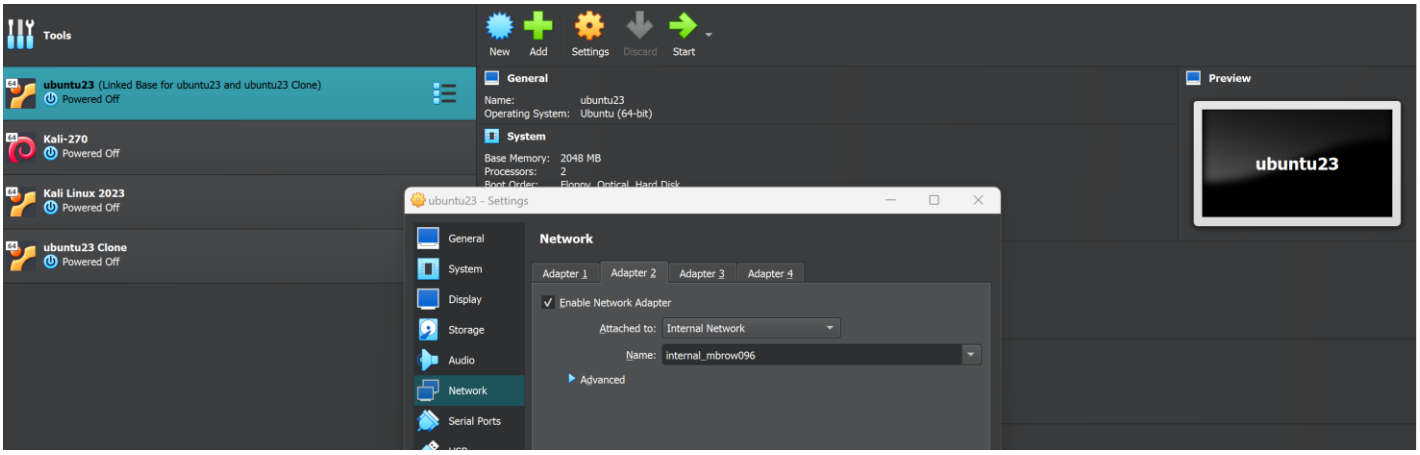
Please configure the network with the following requirement: (You need to clone the existing VM)

Task A –Network Configuration (**60 points**)

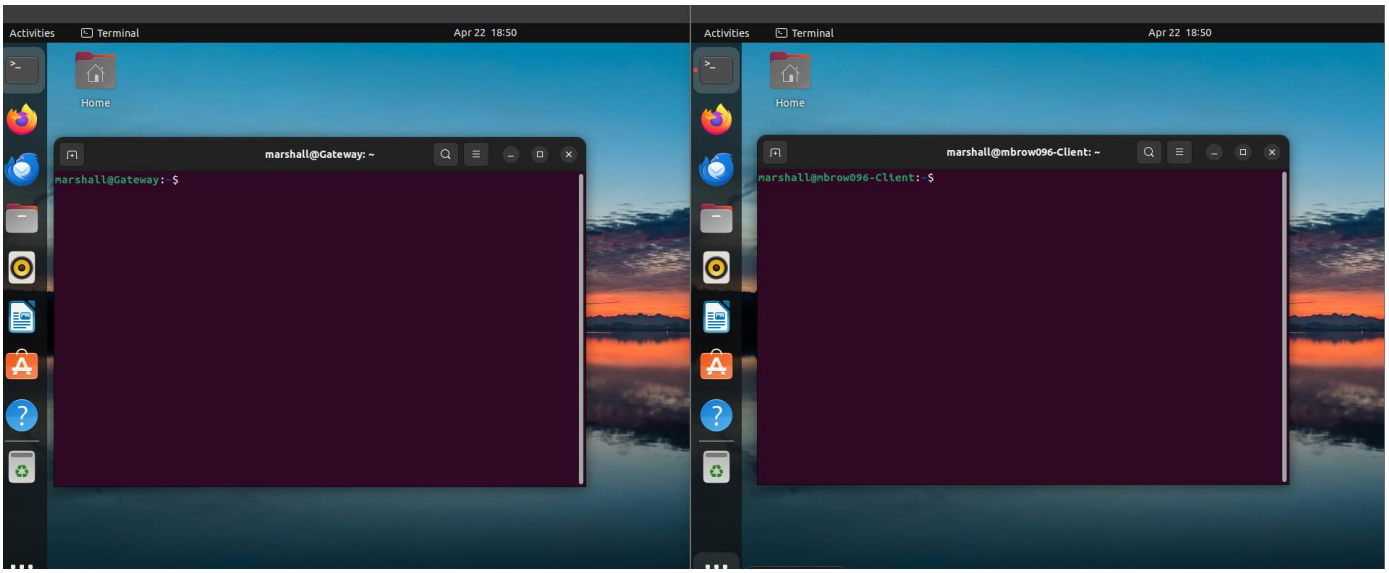
Please submit the screenshot for all the steps.

1. In the virtual box setting, connect two VMs in the same internal network, “internal_{UIN}”.

Replace {UIN} with your real UIN.



2. Change the hostname of the Client VM to "{MIDASname}-Client." **Replace {MIDAS name} with your real MIDAS name.** **Don't forget to reboot your client VM to reflect the change in hostname.**



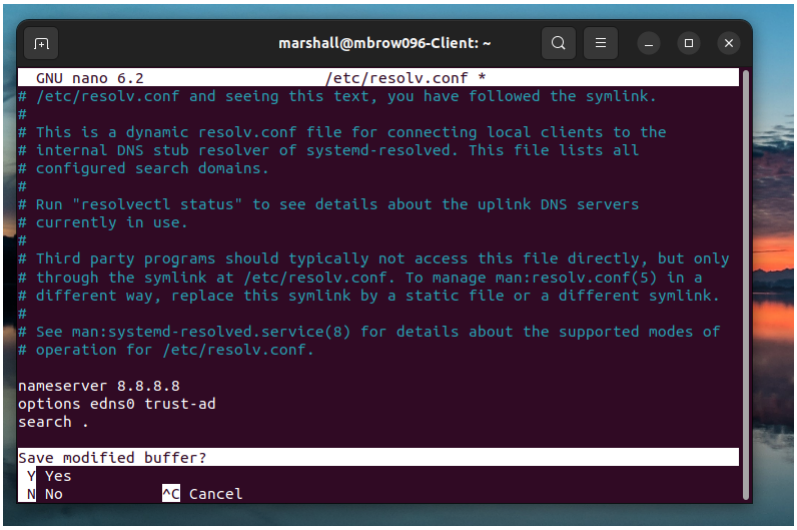
3. Configure the temporary IP address on the Gateway Ubuntu, as shown in Figure 1.

```
marshall@Gateway:~$ sudo ifconfig enp0s8 192.168.120.1
marshall@Gateway:~$
```

4. Configure the temporary IP address, routing table, and DNS server on Client VM as shown in Figure 1.

```
marshall@mbrow096-Client:~$ sudo ifconfig enp0s3 192.168.120.2
[sudo] password for marshall:
marshall@mbrow096-Client:~$
```

```
marshall@mbrow096-Client:~$ sudo ifconfig enp0s3 192.168.120.2
[sudo] password for marshall:
marshall@mbrow096-Client:~$ sudo ip route add default via 192.168.120.1
marshall@mbrow096-Client:~$ sudo ip route add 192.168.120.0/24 dev enp0s3
RTNETLINK answers: File exists
marshall@mbrow096-Client:~$ route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         192.168.120.1   0.0.0.0         UG    0      0        0 enp0s3
169.254.0.0     0.0.0.0         255.255.0.0     U     1000   0        0 enp0s3
192.168.120.0   0.0.0.0         255.255.255.0   U     0      0        0 enp0s3
marshall@mbrow096-Client:~$
```



5. Configure gateway Ubuntu to enable IP forwarding (to forward the traffic) (also NAT configuration)

```
passwd: password updated successfully
Help all@Gateway:~$ su root
Password:
root@Gateway:/home/marshall# echo 1 > /proc/sys/net/ipv4/ip_forward
root@Gateway:/home/marshall# cat /proc/sys/net/ipv4/ip_forward
1
root@Gateway:/home/marshall#
```

6. Test your ping connection to 8.8.8.8 and www.google.com in the client VM, respectively.

```
marshall@mbrow096-Client:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=57 time=26.6 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=57 time=27.9 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=57 time=20.0 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=57 time=25.2 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=57 time=22.5 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4002ms
rtt min/avg/max/mdev = 19.962/24.447/27.922/2.870 ms
marshall@mbrow096-Client:~$
```