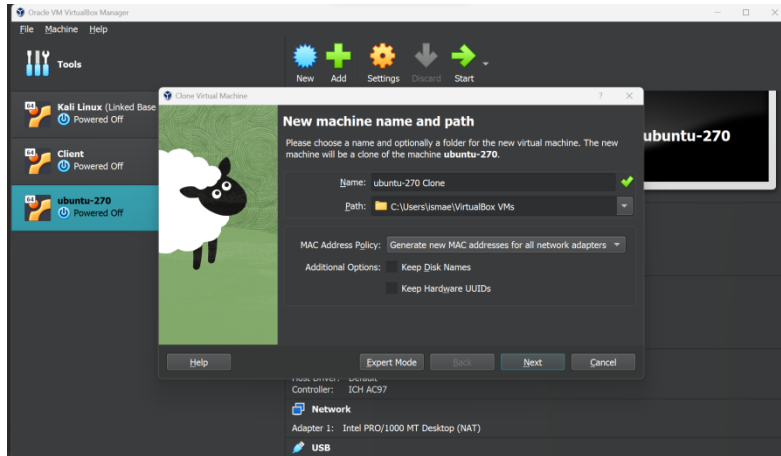


Assignment 12

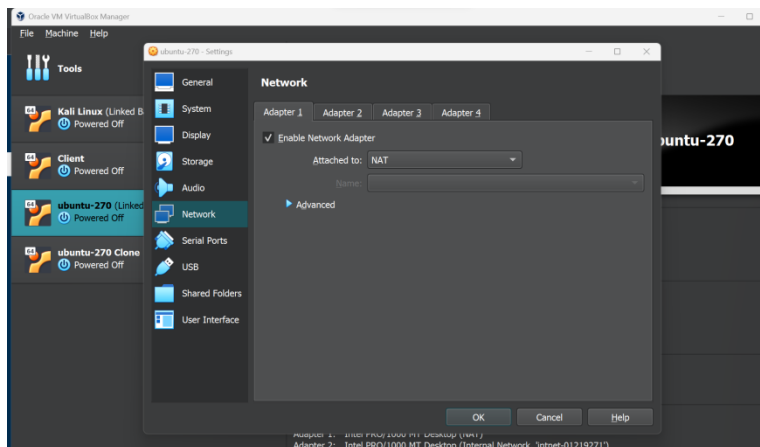
Step0: These are the steps that are included in the lab before you start working on the official steps.

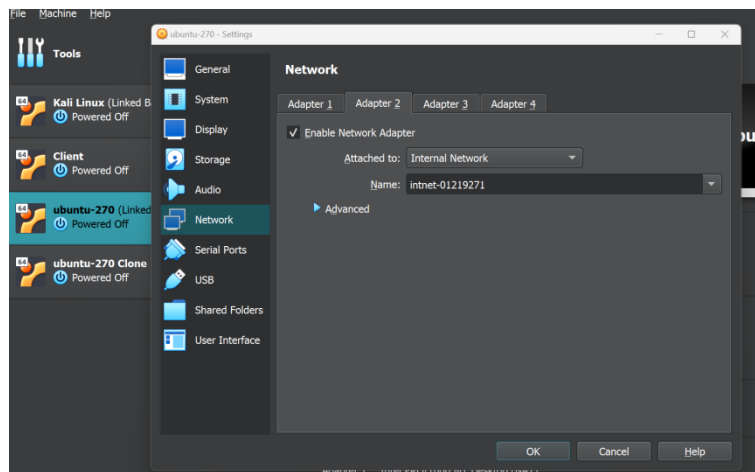
Cloning the current Ubuntu:



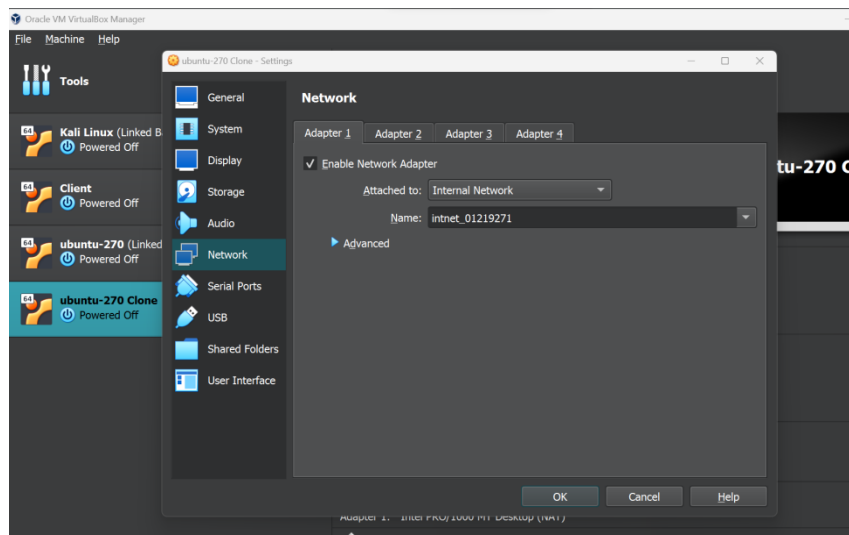
Step1: In the virtual box setting, connect two VMs in the same internal network, “internal_{UIN}”.

Gateway adapters :

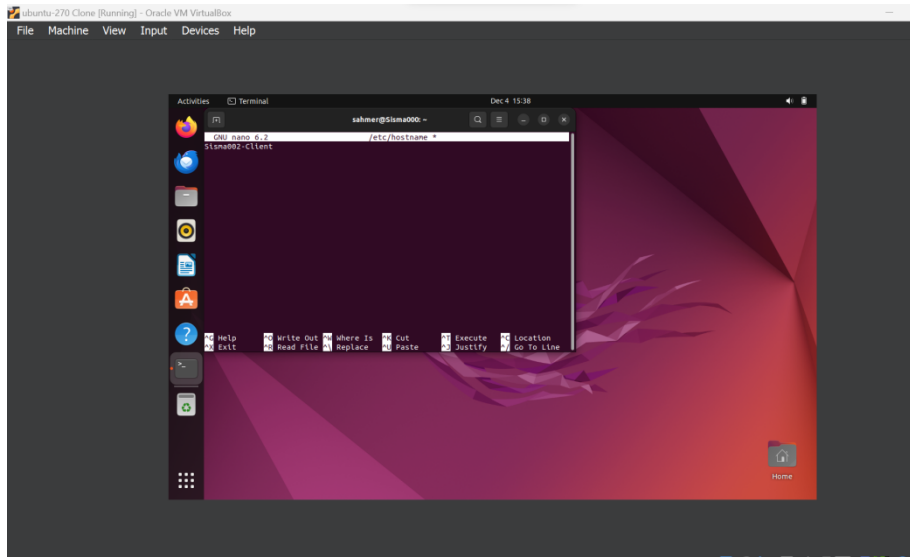




Client adapter:



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.

```

Files @Sisma000:~$ sudo ifconfig enp0s8 192.168.120.1
sahmer@Sisma000:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::203b:1876:6f1:4b12 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:c1:85:7d txqueuelen 1000 (Ethernet)
    RX packets 271 bytes 237859 (237.8 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 277 bytes 26546 (26.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.120.1 netmask 255.255.255.0 broadcast 192.168.120.255
    inet6 fe80::4192:e14e:b4f5:f912 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:0d:12:5e txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 148 bytes 23386 (23.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 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 457 bytes 42763 (42.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 457 bytes 42763 (42.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
  
```

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

```
sahmer@Sisma002-Client:~$ sudo ifconfig enp0s8 192.168.120.2
[sudo] password for sahmer:
sahmer@Sisma002-Client:~$ ifconfig
enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.120.2 netmask 255.255.255.0 broadcast 192.168.120.255
    inet6 fe80::20ca:46ad:3153:e4bf prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:b1:14:0e txqueuelen 1000 (Ethernet)
    RX packets 55 bytes 7469 (7.4 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 152 bytes 16837 (16.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 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 178 bytes 16316 (16.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 178 bytes 16316 (16.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

sahmer@Sisma002-Client:~$ sudo ip route add default via 192.168.120.1
Error: Nexthop has invalid gateway.
sahmer@Sisma002-Client:~$ sudo ip route add 192.168.120.0/24 dev enp0s8
sahmer@Sisma002-Client:~$ route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.120.0 0.0.0.0 255.255.255.0 U 0 0 0 enp0s8
sahmer@Sisma002-Client:~$
```

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

```
sahmer@Sisma000:~$ sudo iptables -t nat -A POSTROUTING -o enp0s3 -j MASQUERADE
[sudo] password for sahmer:
Sorry, try again.
[sudo] password for sahmer:
sahmer@Sisma000:~$ sudo iptables -A FORWARD -i enp0s3 -o enp0s8 -m state RELATED,ESTABLISHED -j ACCEPT
Bad argument 'RELATED,ESTABLISHED'
Try 'iptables -h' or 'iptables --help' for more information.
sahmer@Sisma000:~$ sudo iptables -A FORWARD -i enp0s3 -o enp0s8 -m state --state RELATED,ESTABLISHED -j ACCEPT
sahmer@Sisma000:~$ sudo iptables -A FORWARD -i enp0s8 -o enp0s3 -j ACCEPT
sahmer@Sisma000:~$ sudo iptables -L
Chain INPUT (policy ACCEPT)
target prot opt source destination

Chain FORWARD (policy ACCEPT)
target prot opt source destination state
ACCEPT all -- anywhere anywhere state RELATED,ESTABLISHED
ACCEPT all -- anywhere anywhere

Chain OUTPUT (policy ACCEPT)
target prot opt source destination
sahmer@Sisma000:~$
```

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

```

root@Sisma002-Client: /home/sahmer
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
sahmer@Sisma002-Client:~$ sudo ifconfig enp0s8 192.168.120.2
[sudo] password for sahmer:
sahmer@Sisma002-Client:~$ ifconfig
enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.120.2 netmask 255.255.255.0 broadcast 192.168.120.255
    inet6 fe80::20c:4d01:3551:edf:pref64:scopeld 64:scopeld 64:scopeld 64:scopeld
    ether 08:00:27:1b:14:0e txqueuelen 1000 (Ethernet)
    RX packets 55 bytes 7400 (7.4 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 152 bytes 16837 (16.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 pref16:128 scopeld 0:scopeld 0:scopeld 0:scopeld
    loop 1:scopeld 1:scopeld 1:scopeld 1:scopeld (Local Loopback)
    RX packets 178 bytes 16310 (16.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 178 bytes 16310 (16.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

sahmer@Sisma002-Client:~$ sudo ip route add default via 192.168.120.1
Error: Nexthop has invalid gateway.
sahmer@Sisma002-Client:~$ sudo ip route add 192.168.120.0/24 dev enp0s8
sahmer@Sisma002-Client:~$ route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.120.0 0.0.0.0 255.255.255.0 u 0 0 0 enp0s8
sahmer@Sisma002-Client:~$ su root
Password:
root@Sisma002-Client:/home/sahmer# echo 1 > /proc/sys/net/ipv4/ip_forward
root@Sisma002-Client:/home/sahmer# cat /proc/sys
sys/ sysrq-trigger sysvipc/
root@Sisma002-Client:/home/sahmer# cat /proc/sys/net/ipv4/ipv4/ip_forward
cat: /proc/sys/net/ipv4/ipv4/ip_forward: No such file or directory
root@Sisma002-Client:/home/sahmer# cat /proc/sys/net/ipv4/ip_forward
1
root@Sisma002-Client:/home/sahmer# exit
exit

```

```

sahmer@Sisma002-Client:~$ su root
Password:
root@Sisma002-Client:/home/sahmer# echo 1 > /proc/sys/net/ipv4/ip_forward
root@Sisma002-Client:/home/sahmer# cat /proc/sys
sys/ sysrq-trigger sysvipc/
root@Sisma002-Client:/home/sahmer# cat /proc/sys/net/ipv4/ipv4/ip_forward
cat: /proc/sys/net/ipv4/ipv4/ip_forward: No such file or directory
root@Sisma002-Client:/home/sahmer# cat /proc/sys/net/ipv4/ip_forward
1
root@Sisma002-Client:/home/sahmer# exit
exit

```

```

Chain OUTPUT (policy ACCEPT)
target prot opt source destination
sahmer@Sisma000:~$ 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=52 time=37.6 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=52 time=28.2 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=52 time=24.8 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=52 time=27.0 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=52 time=24.3 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4380ms
rtt min/avg/max/mdev = 24.269/28.351/37.551/4.817 ms
sahmer@Sisma000:~$ ping www.google.com
PING www.google.com (172.253.62.105) 56(84) bytes of data.
64 bytes from bc-in-f105.1e100.net (172.253.62.105): icmp_seq=1 ttl=52 time=16.0 ms
64 bytes from bc-in-f105.1e100.net (172.253.62.105): icmp_seq=2 ttl=52 time=27.1 ms
64 bytes from bc-in-f105.1e100.net (172.253.62.105): icmp_seq=3 ttl=52 time=14.0 ms
64 bytes from bc-in-f105.1e100.net (172.253.62.105): icmp_seq=4 ttl=52 time=27.3 ms
^C
--- www.google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3016ms
rtt min/avg/max/mdev = 13.980/21.087/27.264/6.138 ms
sahmer@Sisma000:~$

```

1. Configure the iptables on the gateway Ubuntu to block all the inbound ICMP packets from the Client VM.

```

$ sudo iptables -A INPUT -s 192.168.120.2 -p tcp -j DROP

```

2. Configure the iptables on the gateway Ubuntu to block all the outbound ICMP packets that originated from the gateway Ubuntu itself.

```
sahmer@Sisma000:~$ sudo iptables -A OUTPUT -m tcp -p tcp -d 192.168.120.1 --dport 80 -j DROP
```

