

## Cloud Computing Lab 7:

### VM Networking 1

**Due Date: Tuesday, March 30, 2021 (11:59pm).**

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**Student ID: 2041606 - Objective**

Understanding VM networking operation and configuration on VMware Workstation Platform.

### Equipment, Tools, Hardware, and Software Needed

1. Desktop PC, Laptop with internet connection.
2. VMware Workstation software - free downloadable
3. Ubuntu (live image) - free downloadable. You may download other Operating Systems image.

### Theorem

One of the essential configuration and settings on Cloud Computing is network configuration and setting. There are multiple of types on how to connect a VM to a network, basically there are four types

- **Network Address Translation (NAT) – Default**
- **Host-Only Networking**
- **Bridged Networking**
- **Custom networking** (or the customized network configuration)

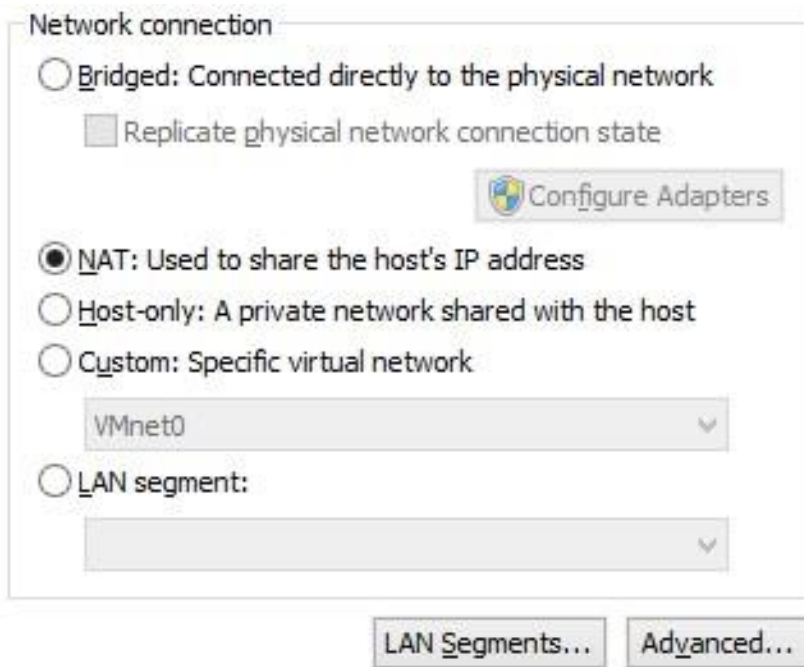


Figure 1 Network Connection Settings

In this Lab, we will prepare and review the available network configuration through VMware Workstation.

We will focus on **Network Address Translation (NAT)**, **Bridged Networking** and **Host-Only Networking**.

### Procedure

**\*\*\* Note: Use your previous Lab VMs**

USE ONE VIRTUAL MACHINE TO PRACTICE THE FOLLOWING NETWORK SETTINGS (as shown on the above Figure 1):

- Currently the VM is set on **NAT** configurations.
- **Trial 1:** POWER ON the VM and report its Network Configuration - POWER OFF the VM.
- **Trial 2:** While the Virtual Machine is POWER OFF, Change the Network setting to Bridged.
- POWER ON the VM and report its Network Configuration ○ Can you Ping Google (IP 8.8.8.8)?
- POWER OFF the VM.
- **Trial 3:** While the VM is POWER OFF, change the Network setting to Host-Only
- POWER ON the VM and report its Network Configuration ○ Can you Ping Google (IP 8.8.8.8)?
- POWER OFF the VM
- While the VM is POWER OFF, change the Network setting to NAT

### Lab Report

Question 1: What was the observation at the network settings for each trial?

Question 2: Which of the Network settings will allow the VM to access the outside network, i.e. Internet?

Question 3: Which of the Network setting will provide segregation (isolation) between co-hosted virtual machines?

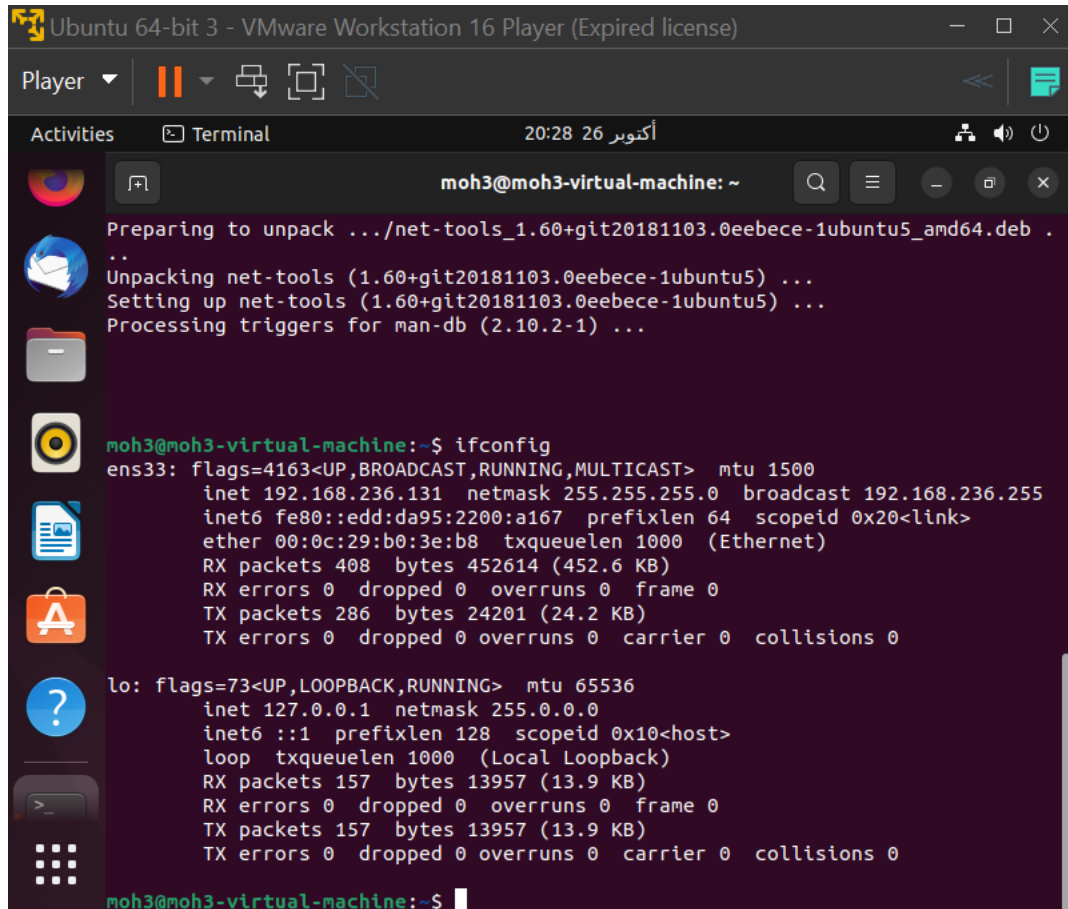
For the lab report, take a screenshots of your VMware Workstation configuration and include Command Line logs for the Virtual Machines as requested in the Lab Task.

Q1 : the Nat and Bridged are reachable we can ping on goolge , but host-only is not !!

Q2: Bridged And Nat

Q3 : host-only

If config to see ips (nat)



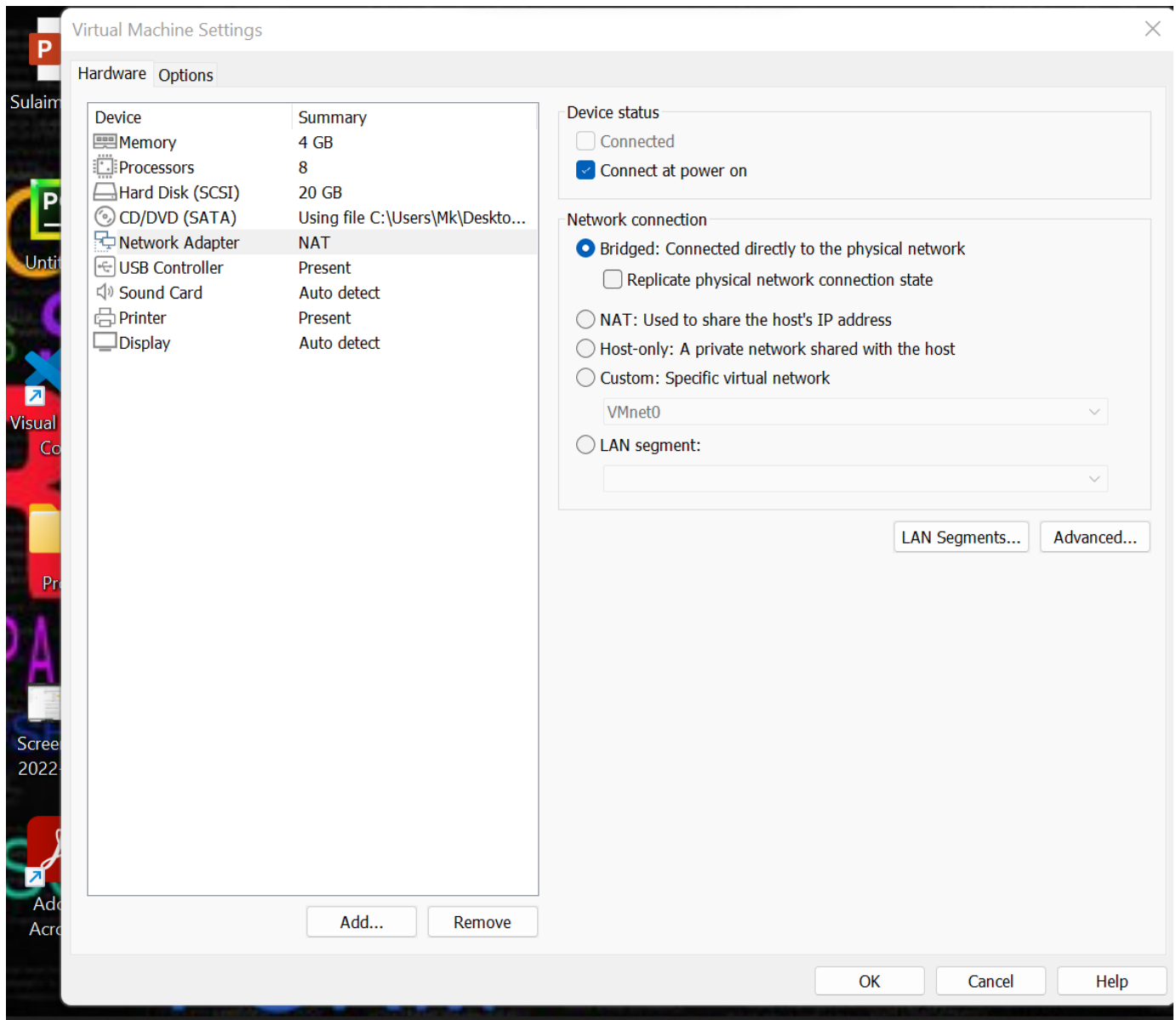
```
Preparing to unpack .../net-tools_1.60+git20181103.0eebece-1ubuntu5_amd64.deb .
..
Unpacking net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Setting up net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Processing triggers for man-db (2.10.2-1) ...

moh3@moh3-virtual-machine:~$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.236.131 netmask 255.255.255.0 broadcast 192.168.236.255
    inet6 fe80::edd:da95:2200:a167 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:b0:3e:b8 txqueuelen 1000 (Ethernet)
    RX packets 408 bytes 452614 (452.6 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 286 bytes 24201 (24.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

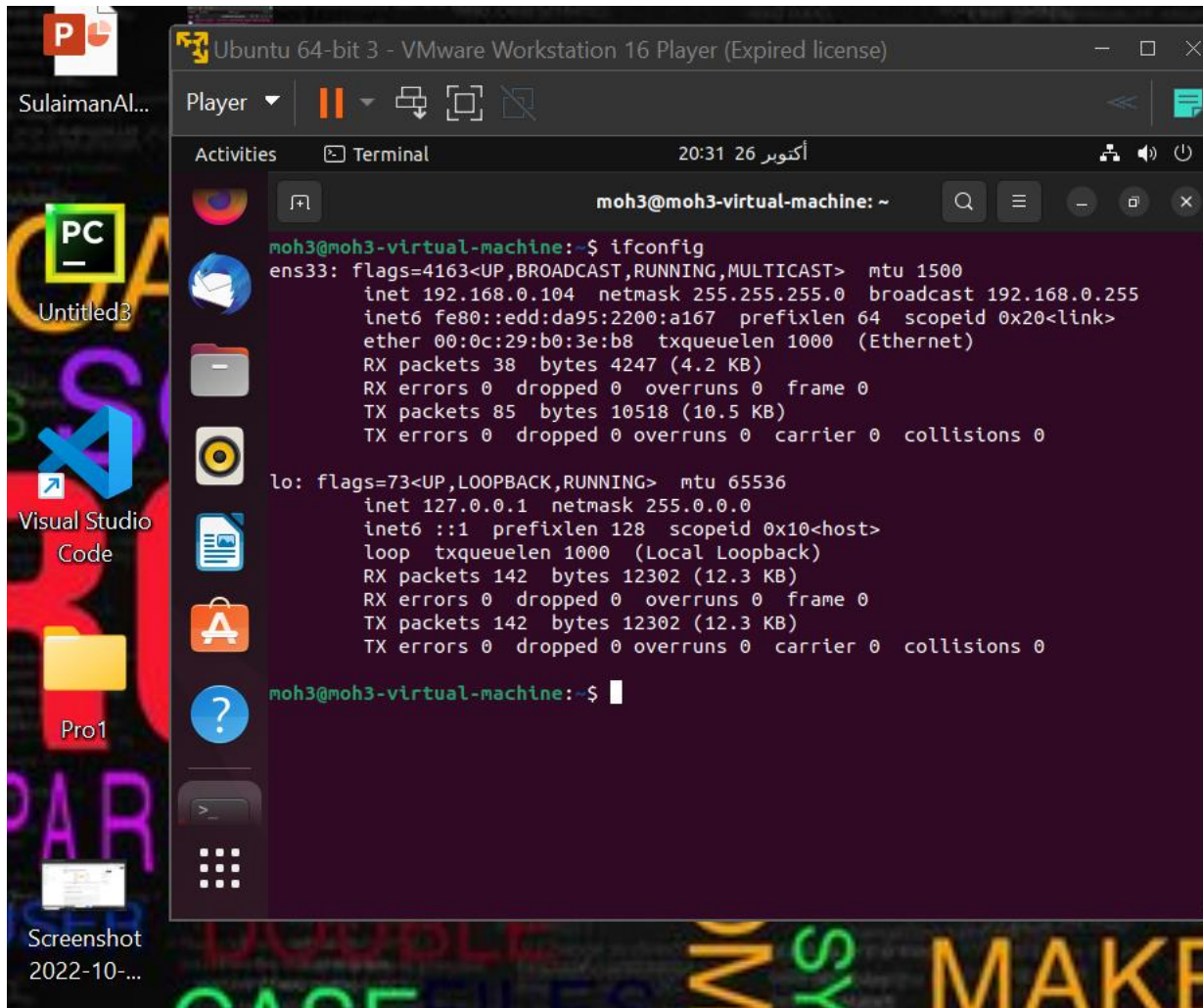
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 157 bytes 13957 (13.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 157 bytes 13957 (13.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

moh3@moh3-virtual-machine:~$
```

Change the network to Bridged



If config to see ips



Ubuntu 64-bit 3 - VMware Workstation 16 Player (Expired license)

Player ▾ || ▾ ▾ ▾ ▾

Activities Terminal 20:31 26 أكتوبر

moh3@moh3-virtual-machine: ~

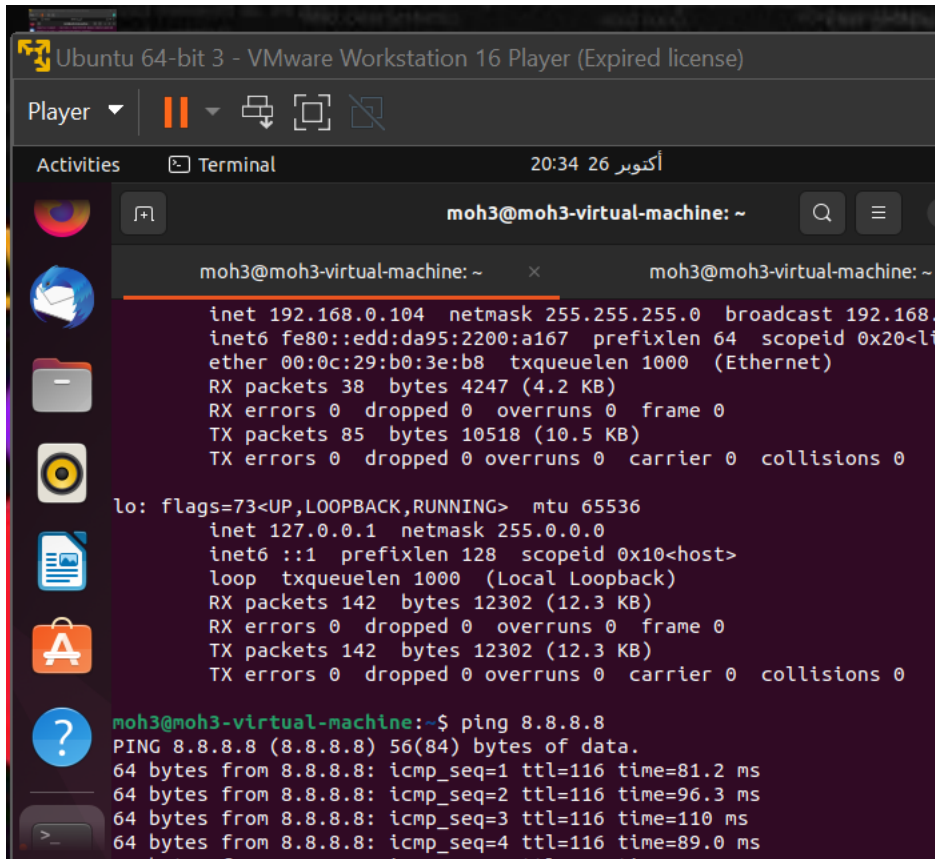
```
moh3@moh3-virtual-machine:~$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.104 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::edd:da95:2200:a167 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:b0:3e:b8 txqueuelen 1000 (Ethernet)
    RX packets 38 bytes 4247 (4.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 85 bytes 10518 (10.5 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 142 bytes 12302 (12.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 142 bytes 12302 (12.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

moh3@moh3-virtual-machine:~$
```

Screenshot 2022-10-...

Try to ping google and see it's reachable or not

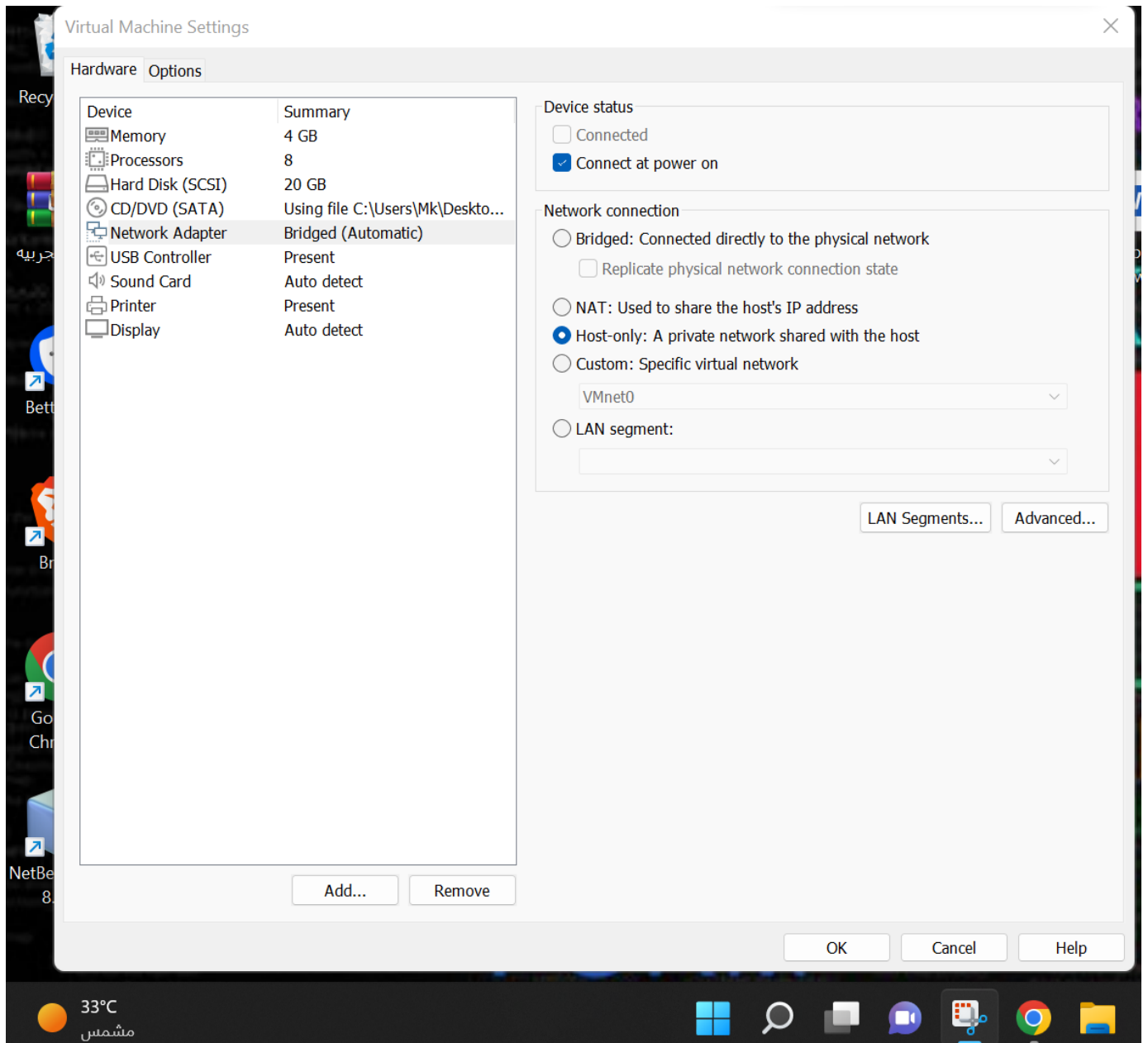


```
Ubuntu 64-bit 3 - VMware Workstation 16 Player (Expired license)
Player
Activities Terminal 20:34 26 أكتوبر
moh3@moh3-virtual-machine: ~
moh3@moh3-virtual-machine: ~
inet 192.168.0.104 netmask 255.255.255.0 broadcast 192.168.0.104
inet6 fe80::edd:da95:2200:a167 prefixlen 64 scopeid 0x20<link-local>
ether 00:0c:29:b0:3e:b8 txqueuelen 1000 (Ethernet)
RX packets 38 bytes 4247 (4.2 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 85 bytes 10518 (10.5 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 142 bytes 12302 (12.3 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 142 bytes 12302 (12.3 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

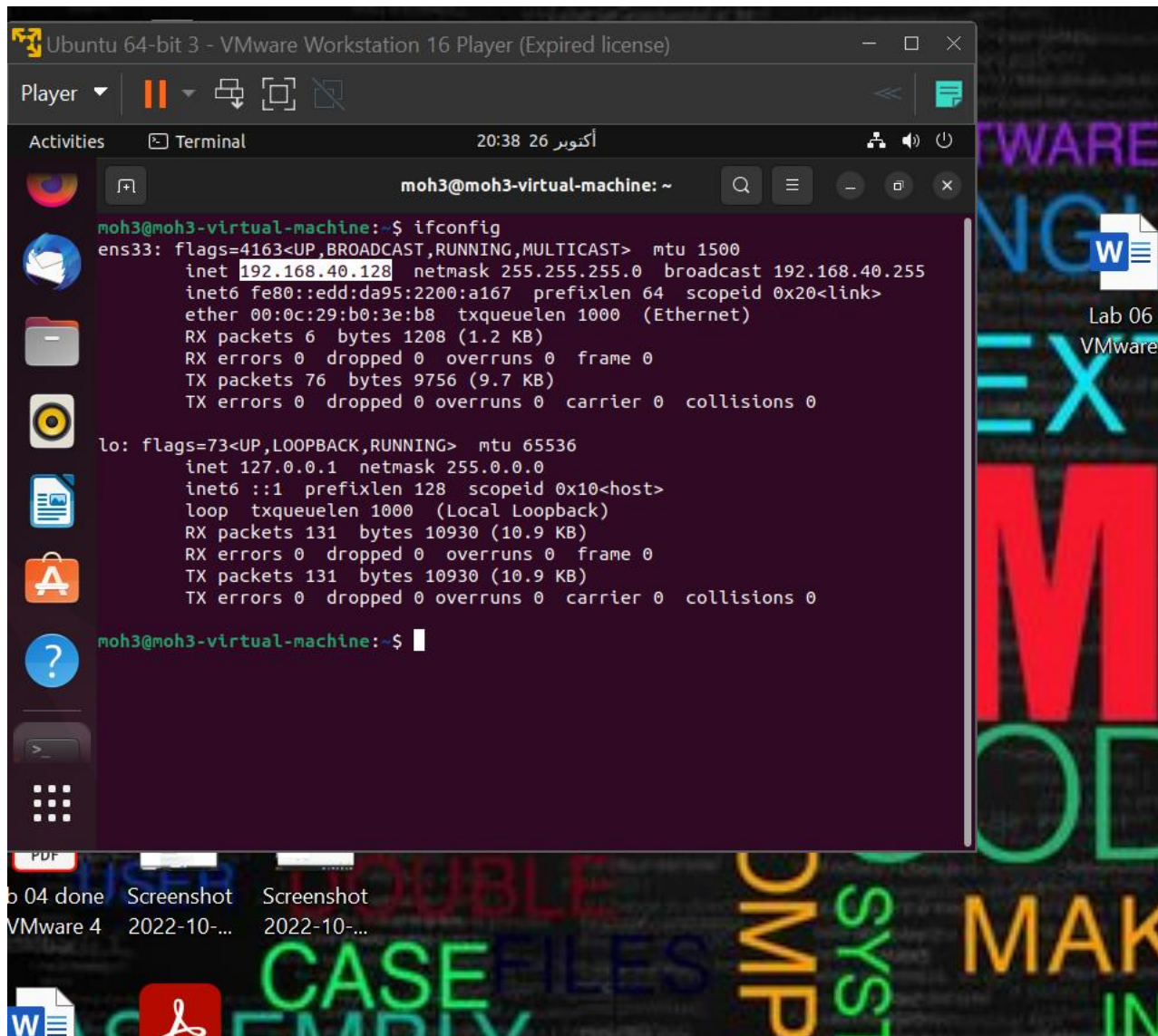
moh3@moh3-virtual-machine:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=116 time=81.2 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=116 time=96.3 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=116 time=110 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=116 time=89.0 ms
```

Change the network to host





lps



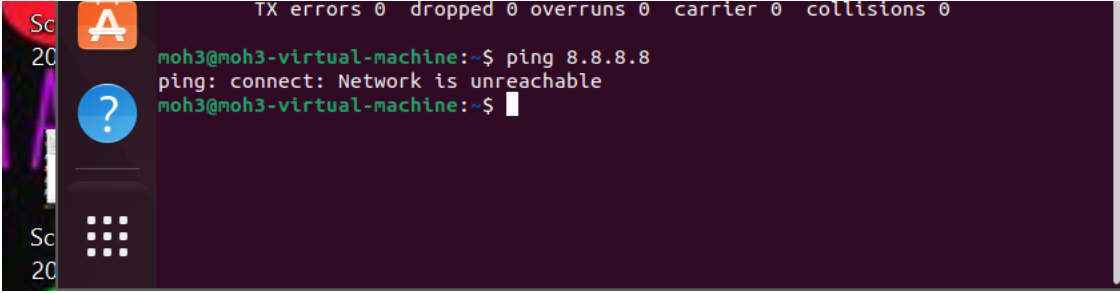
```
Ubuntu 64-bit 3 - VMware Workstation 16 Player (Expired license)
Player
Activities Terminal 20:38 26 أكتوبر
moh3@moh3-virtual-machine: ~
moh3@moh3-virtual-machine:~$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.40.128 netmask 255.255.255.0 broadcast 192.168.40.255
    inet6 fe80::edd:da95:2200:a167 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:b0:3e:b8 txqueuelen 1000 (Ethernet)
    RX packets 6 bytes 1208 (1.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 76 bytes 9756 (9.7 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 131 bytes 10930 (10.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 131 bytes 10930 (10.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

moh3@moh3-virtual-machine:~$
```



Can't ping google its unreachable

A screenshot of a Linux terminal window. The terminal has a dark purple background. At the top, it shows network statistics: 'TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0'. Below this, the user 'moh3' is at the prompt 'moh3@moh3-virtual-machine:~\$'. They have entered the command 'ping 8.8.8.8'. The output of the command is 'ping: connect: Network is unreachable'. The prompt 'moh3@moh3-virtual-machine:~\$' is shown again with a cursor. On the left side of the terminal, there is a vertical sidebar with icons: a red 'Sc' icon, an orange 'A' icon, a blue circle with a white question mark, and a white grid icon. The text 'Sc' and '20' are visible next to the first two icons.

```
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
moh3@moh3-virtual-machine:~$ ping 8.8.8.8
ping: connect: Network is unreachable
moh3@moh3-virtual-machine:~$
```