

COMPUTER NETWORKS LABORATORY

By:

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WEEK – 1 - LEARN AND UNDERSTAND NETWORK TOOLS

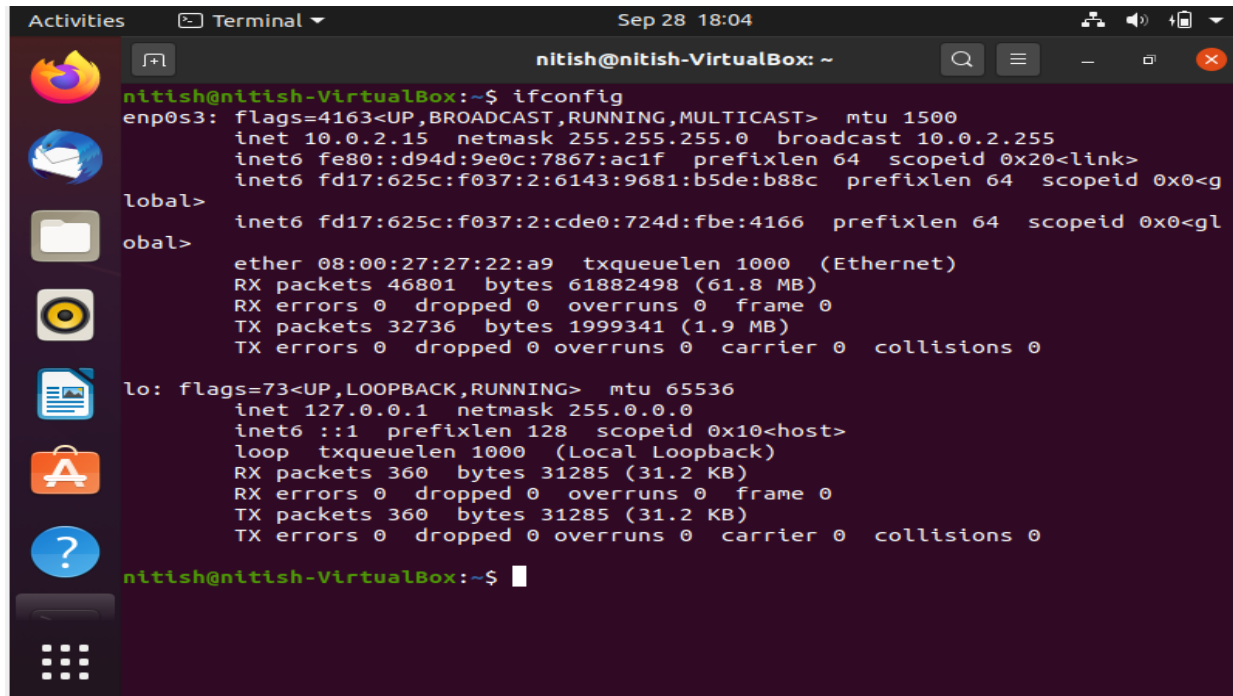
DATE: 31/08/2020

RESUBMISSION OF TASK 1 and TASK 7:-

TASK – 1: LINUX INTERFACE CONFIGURATION (IFCONFIG / IP COMMAND):

Step -1: To display status of all active network interfaces:

ifconfig (or) ip addr show



```
nitish@nitish-VirtualBox:~$ 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::d94d:9e0c:7867:ac1f prefixlen 64 scopeid 0x20<link>
    inet6 fd17:625c:f037:2:6143:9681:b5de:b88c prefixlen 64 scopeid 0x0<g
    inet6 fd17:625c:f037:2:cde0:724d:fbe:4166 prefixlen 64 scopeid 0x0<gl
    ether 08:00:27:27:22:a9 txqueuelen 1000 (Ethernet)
    RX packets 46801 bytes 61882498 (61.8 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 32736 bytes 1999341 (1.9 MB)
    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 360 bytes 31285 (31.2 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 360 bytes 31285 (31.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

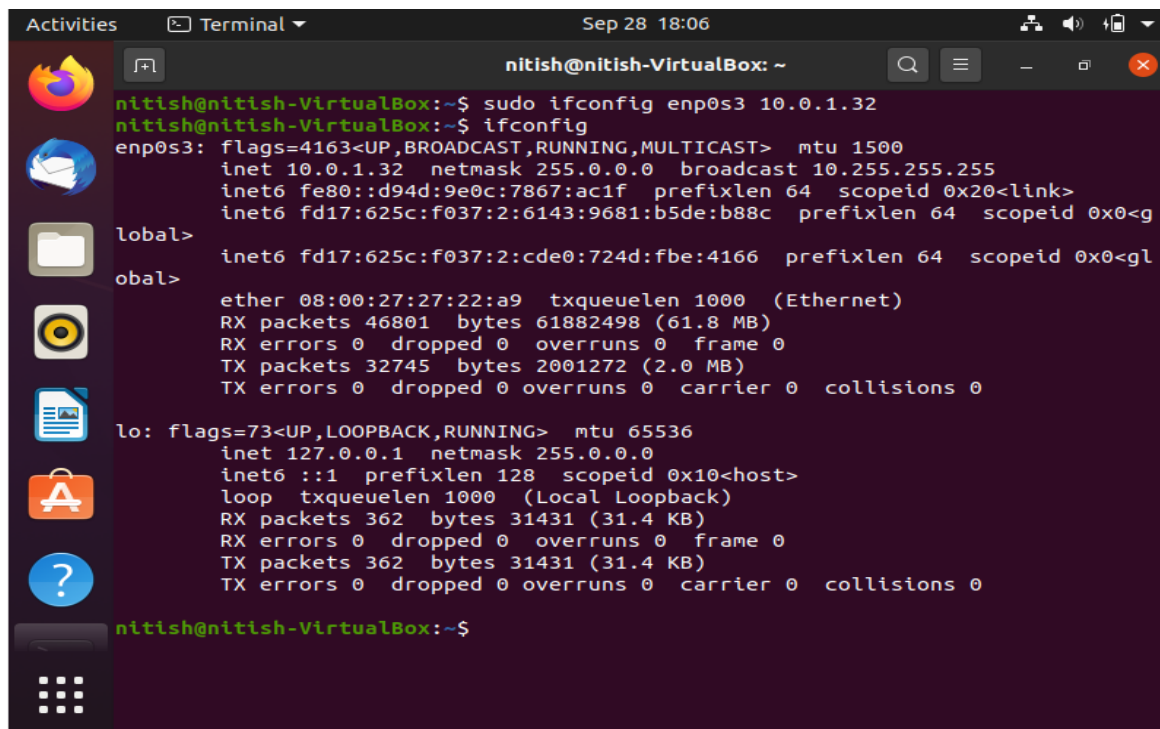
nitish@nitish-VirtualBox:~$
```

ip address table:-

Interface name	IP address (IPv4 / IPv6)	MAC address
enp0s3	10.0.2.15 netmask 255.0.0.0	08:00:27:89:68:38
lo	127.0.0.1 netmask 255.0.0.0	00:00:00:00:00:00

Step – 2: To assign an IP address to an interface , use the following command:

sudo ifconfig enp0s3 10.0.1.32



```
nitish@nitish-VirtualBox: ~$ sudo ifconfig enp0s3 10.0.1.32
nitish@nitish-VirtualBox: ~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.1.32 netmask 255.0.0.0 broadcast 10.255.255.255
    inet6 fe80::d94d:9e0c:7867:ac1f prefixlen 64 scopeid 0x20<link>
    inet6 fd17:625c:f037:2:6143:9681:b5de:b88c prefixlen 64 scopeid 0x0<global>
    ether 08:00:27:27:22:a9 txqueuelen 1000 (Ethernet)
    RX packets 46801 bytes 61882498 (61.8 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 32745 bytes 2001272 (2.0 MB)
    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 362 bytes 31431 (31.4 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 362 bytes 31431 (31.4 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

nitish@nitish-VirtualBox: ~$
```

ip address table:-

Interface name	IP address (IPv4 / IPv6)	MAC address
enp0s3	10.0.1.32 netmask 255.0.0.0	08:00:27:89:68:38
lo	127.0.0.1 netmask 255.0.0.0	00:00:00:00:00:00

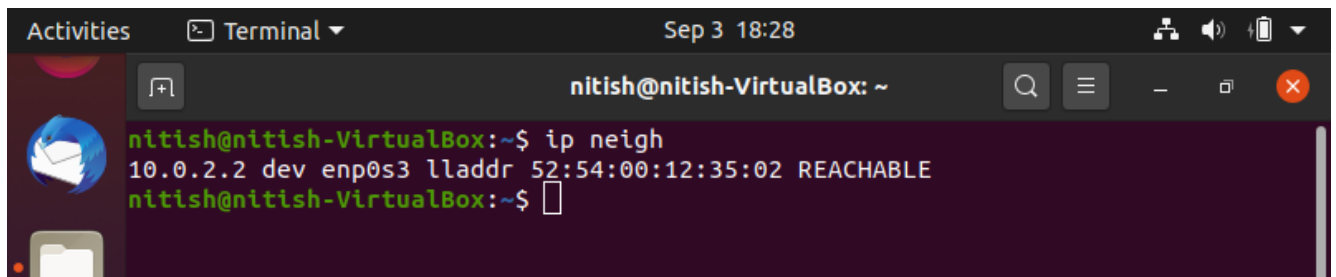
Step -3 : To activate/ deactivate a network interface type:

sudo ifconfig 10.0.1.32 down

sudo ifconfig 10.0.1.32 up

Step – 4: To show the current neighbor table in kernel , type:

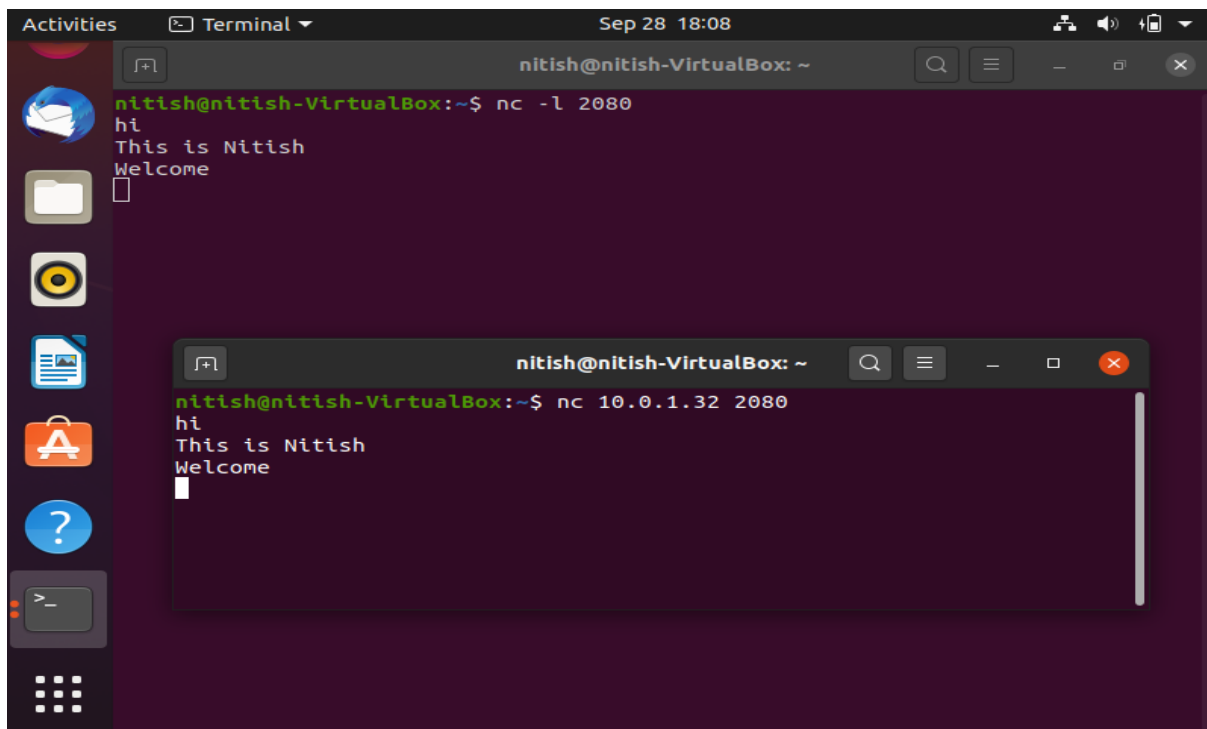
ip neigh



```
nitish@nitish-VirtualBox: ~$ ip neigh
10.0.2.2 dev enp0s3 lladdr 52:54:00:12:35:02 REACHABLE
nitish@nitish-VirtualBox:~$
```

TASK – 7a) NETCAT AS A CHAT TOOL:

a) INTRA-SYSTEM COMMUNICATION:-

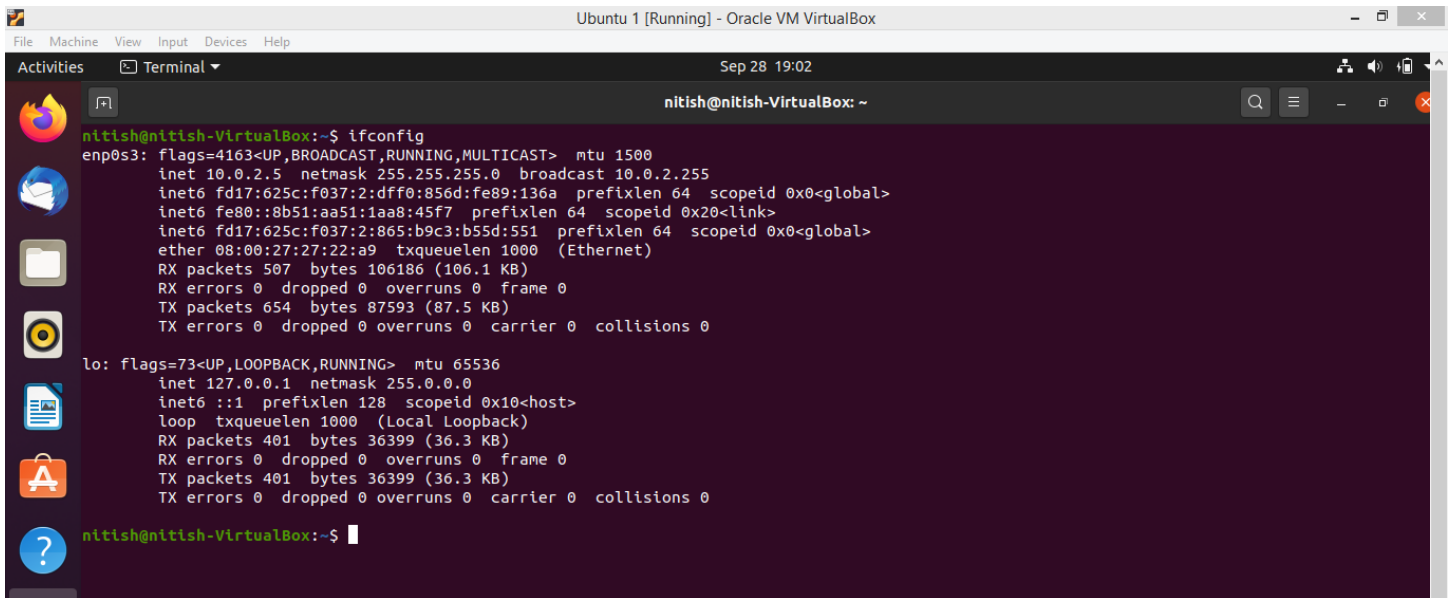


```
nitish@nitish-VirtualBox:~$ nc -l 2080
hi
This is Nitish
Welcome
^C

nitish@nitish-VirtualBox:~$ nc 10.0.1.32 2080
hi
This is Nitish
Welcome
^C
```

b) INTER-SYSTEM COMMUNICATION (USING 2 VMs):

IP ADDRESS OF THE SERVER MACHINE: 10.0.2.5



```
nitish@nitish-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.5 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fd17:625c:f037:2:dff0:856d:fe89:136a prefixlen 64 scopeid 0x0<global>
    inet6 fe80::8b51:aa51:1aa8:45f7 prefixlen 64 scopeid 0x20<link>
    inet6 fd17:625c:f037:2:865:b9c3:b55d:551 prefixlen 64 scopeid 0x0<global>
    ether 08:00:27:27:22:a9 txqueuelen 1000 (Ethernet)
    RX packets 507 bytes 106186 (106.1 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 654 bytes 87593 (87.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

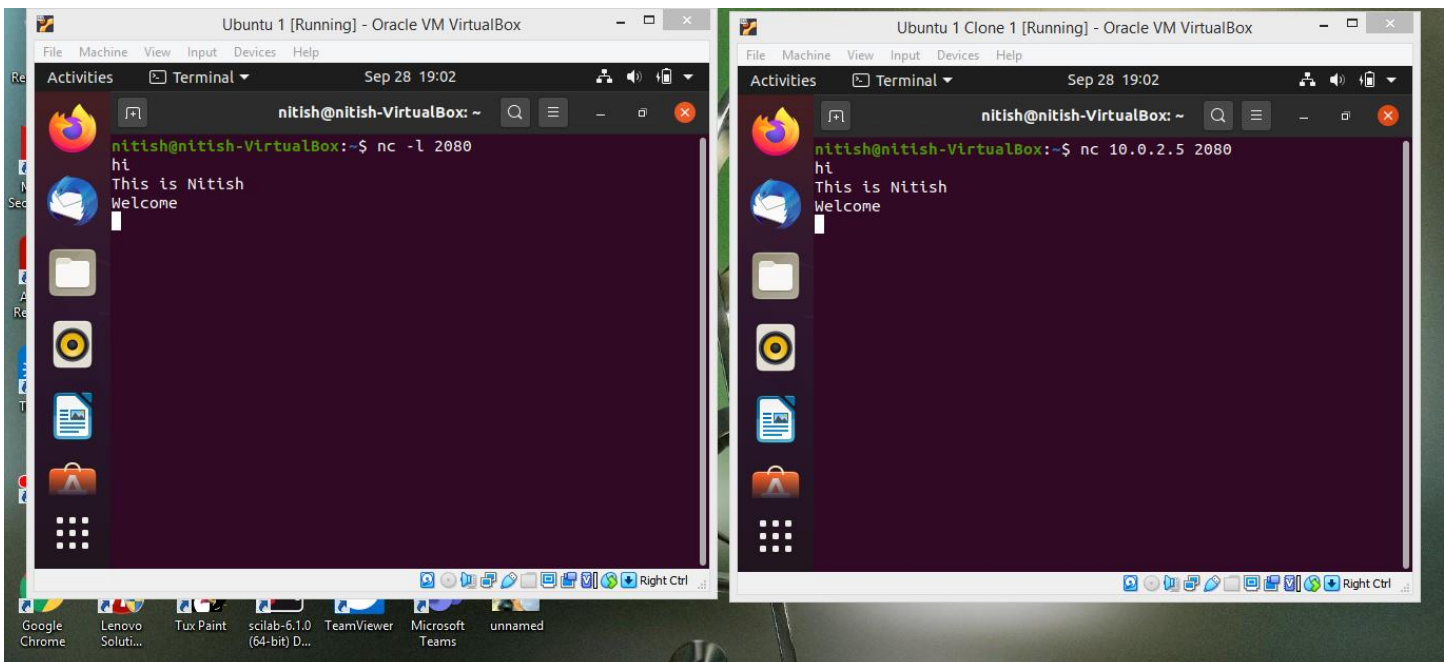
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 401 bytes 36399 (36.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 401 bytes 36399 (36.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

nitish@nitish-VirtualBox:~$
```

INTER-SYSTEM COMMUNICATION:-

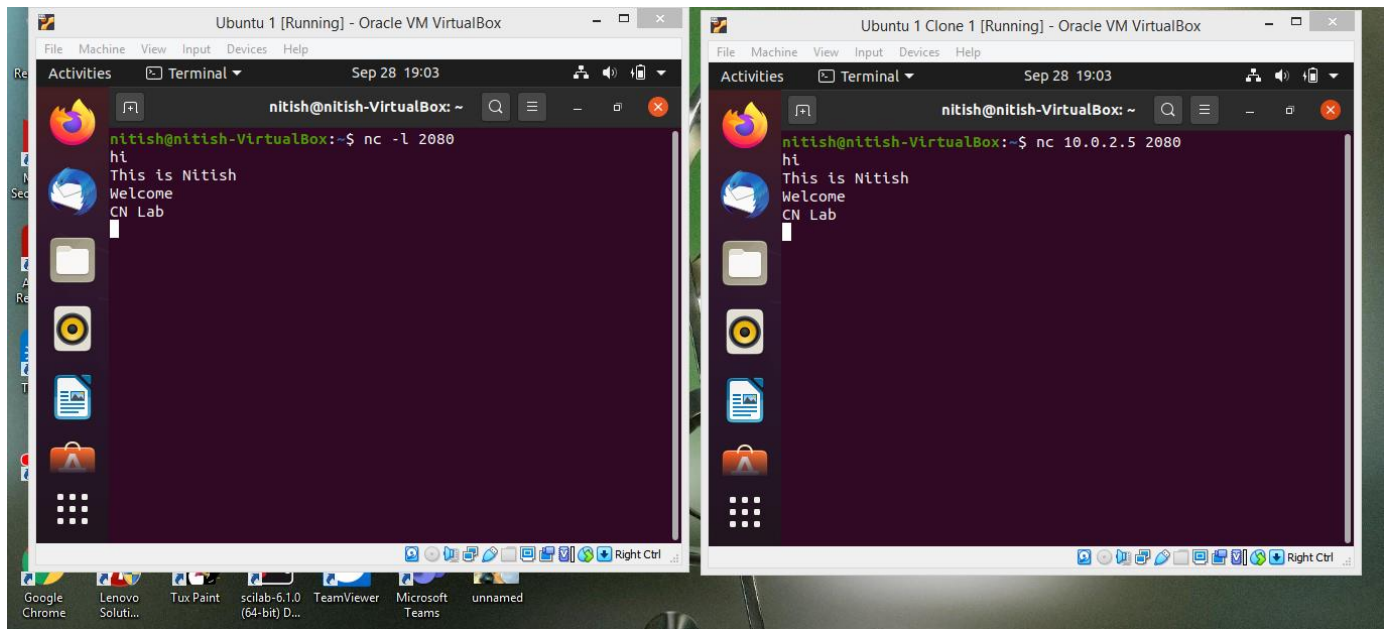
SERVER MACHINE

CLIENT MACHINE



SERVER MACHINE

CLIENT MACHINE



TASK – 7b) USE NETCAT TO TRANSFER FILES:-

IP ADDRESS OF THE SERVER MACHINE: 10.0.2.5

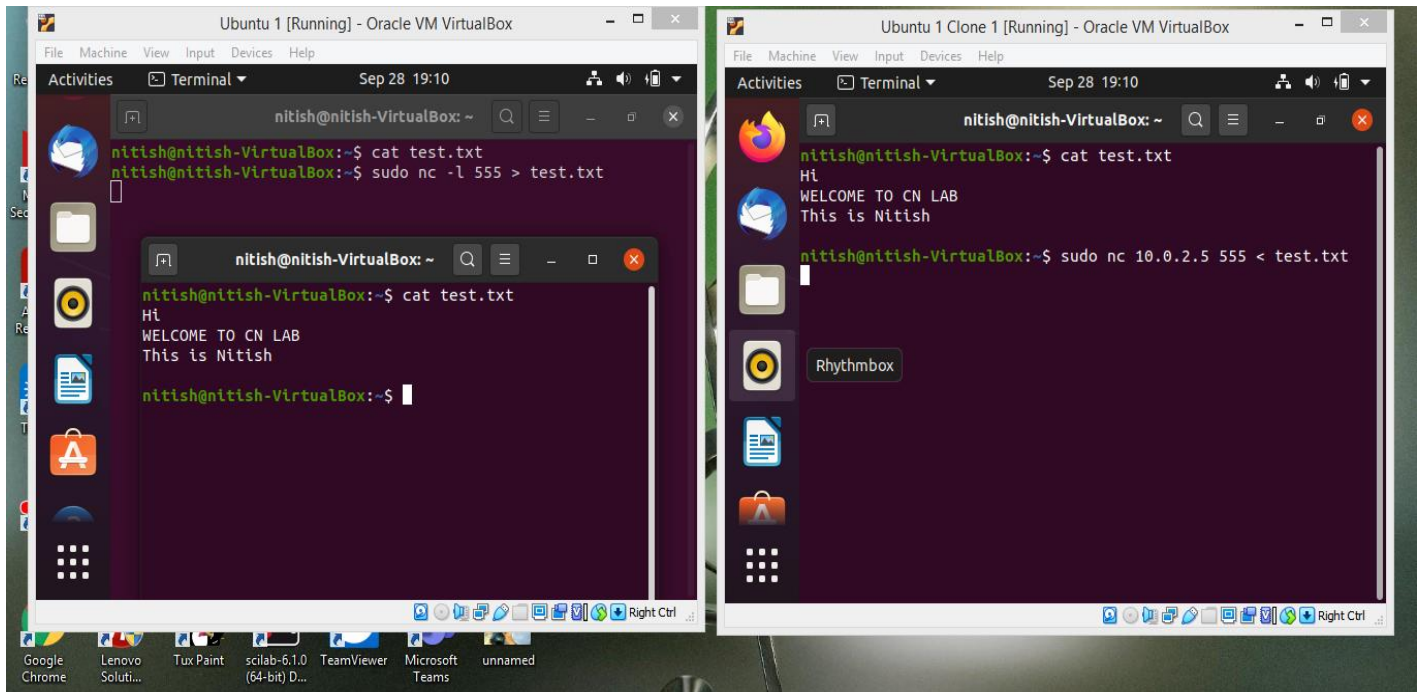
Can be observed from the below screenshot that initially, the test.txt was empty as the cat command did not give any output.

But once the **sudo nc -l 555 > test.txt** is run in the server side and

sudo nc 10.0.2.5 555 < test.txt is run on the client machine, the file gets transferred and hence as a result the contents of test.txt from the client machine is copied into test.txt in the server machine too.

SERVER MACHINE

CLIENT MACHINE



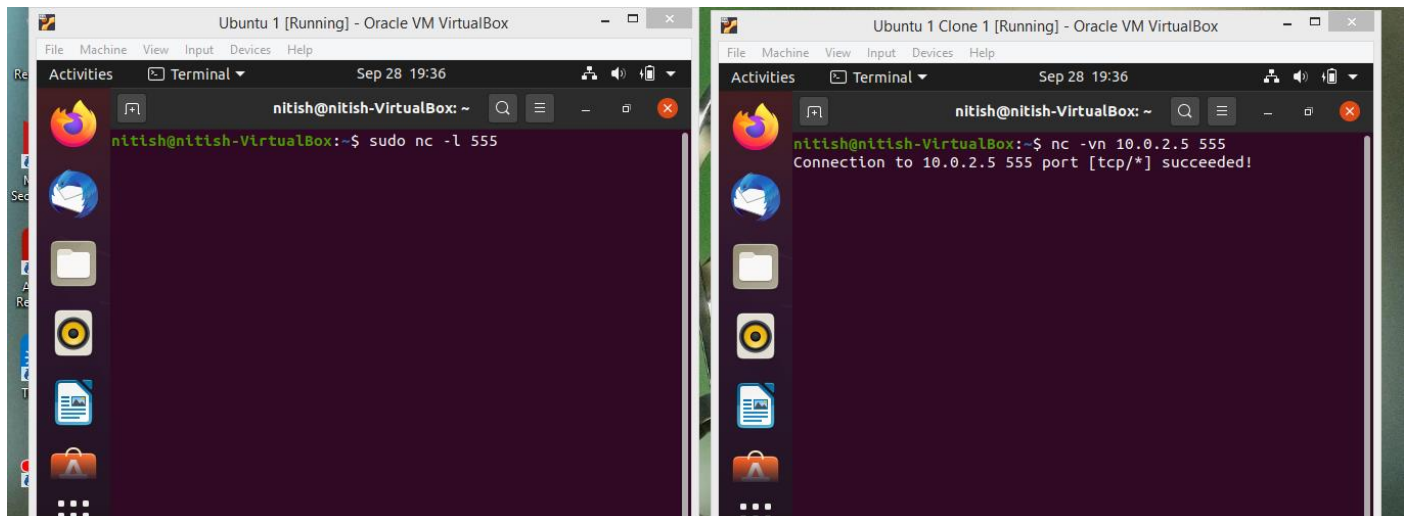
TASK – 7c) OTHER COMMANDS:-

1) To test if a particular TCP port of a remote host is open.

Command used: `nc -vn 10.0.2.5 555` (checks if the port 555 is open in the server machine with IP address 10.0.2.5)

SERVER MACHINE

CLIENT MACHINE



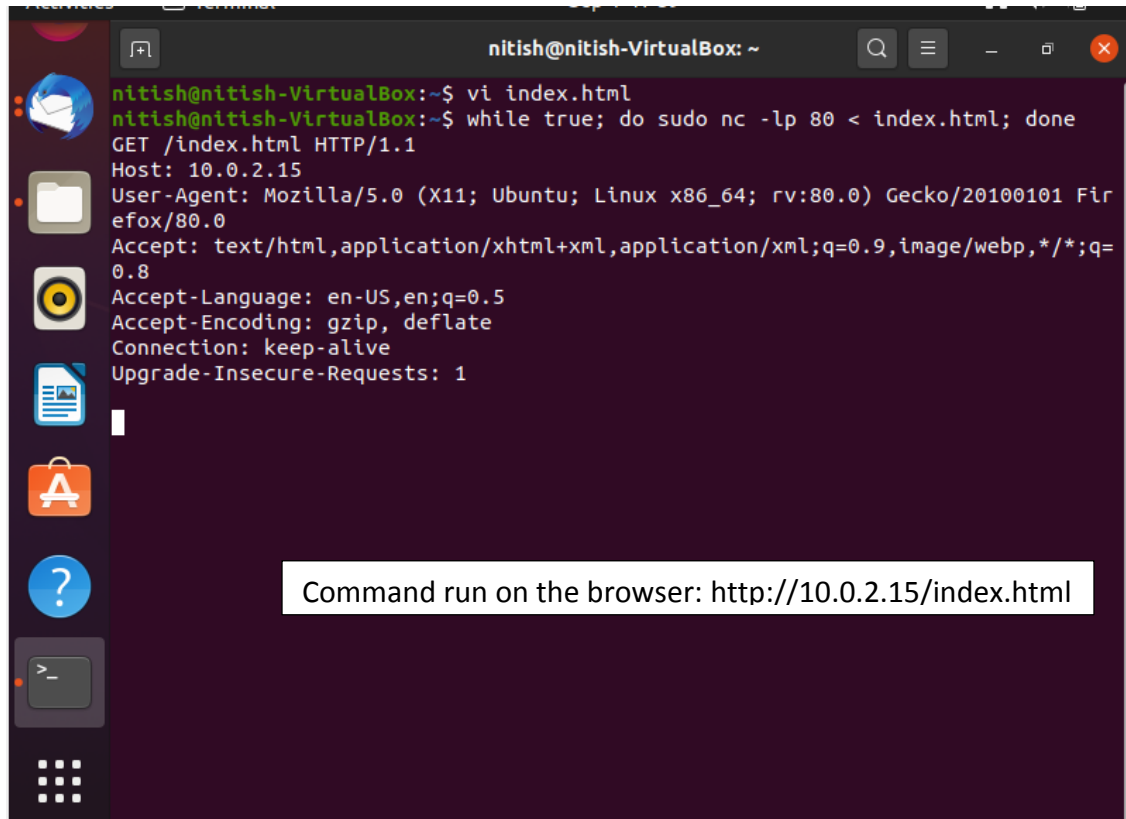
2) Run a webserver with a static webpage.

Step – 1) Run the command below on the localhost (e.g.10.0.2.15 -IP address of the server machine) to start a webserver that server test.html on port 80.

while true; do sudo nc -lp 80 < test.html; done

Step – 2) Now open <http://10.0.2.15/test.html> from another host to access it.

Step – 3) Observe the details on the terminal.



```
nitish@nitish-VirtualBox: ~  
nitish@nitish-VirtualBox:~$ vi index.html  
nitish@nitish-VirtualBox:~$ while true; do sudo nc -lp 80 < index.html; done  
GET /index.html HTTP/1.1  
Host: 10.0.2.15  
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:80.0) Gecko/20100101 Firefox/80.0  
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8  
Accept-Language: en-US,en;q=0.5  
Accept-Encoding: gzip, deflate  
Connection: keep-alive  
Upgrade-Insecure-Requests: 1
```

Command run on the browser: <http://10.0.2.15/index.html>