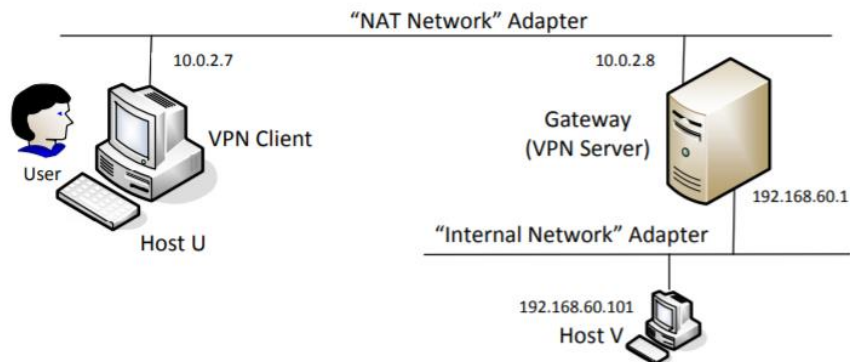
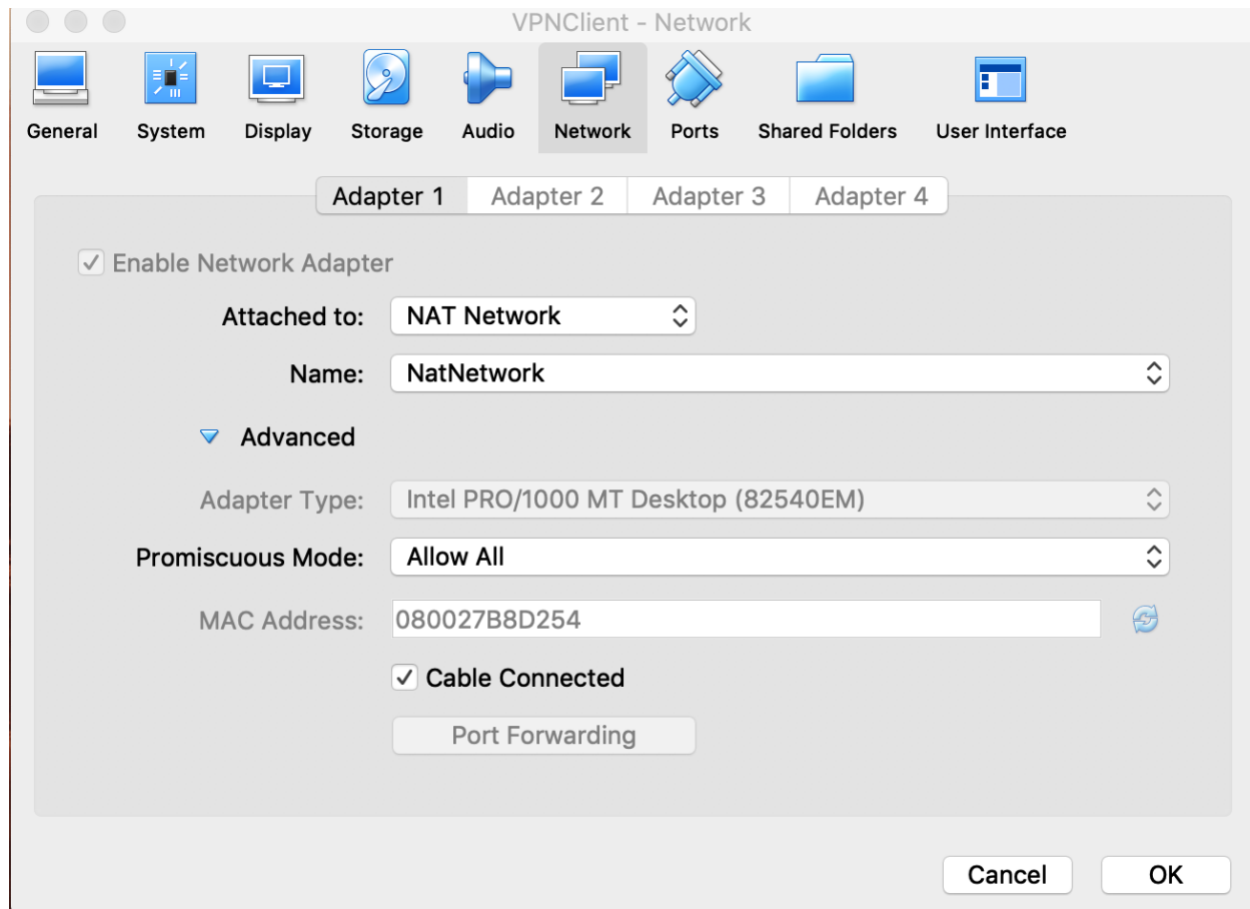


Virtual Private Network (VPN) LAB

TASK 1: VM Setup



VPN CLIENT

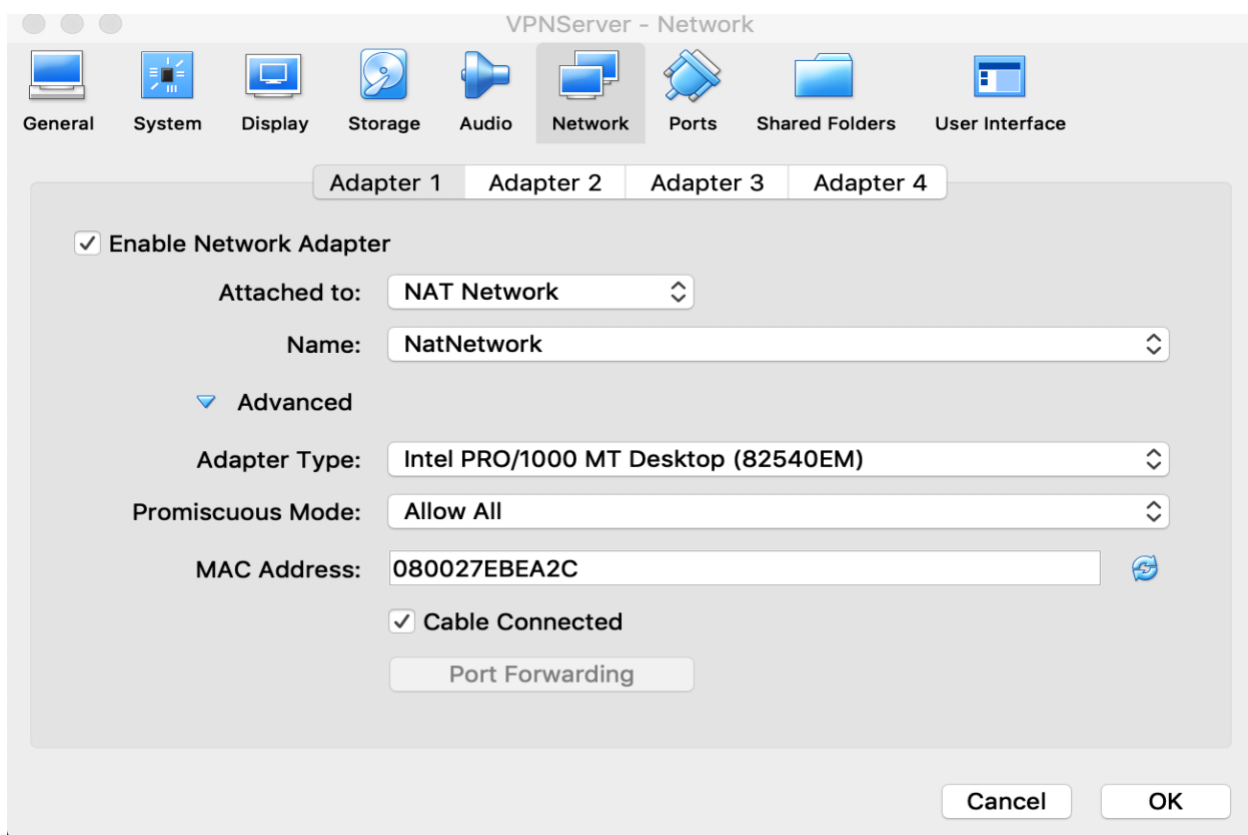


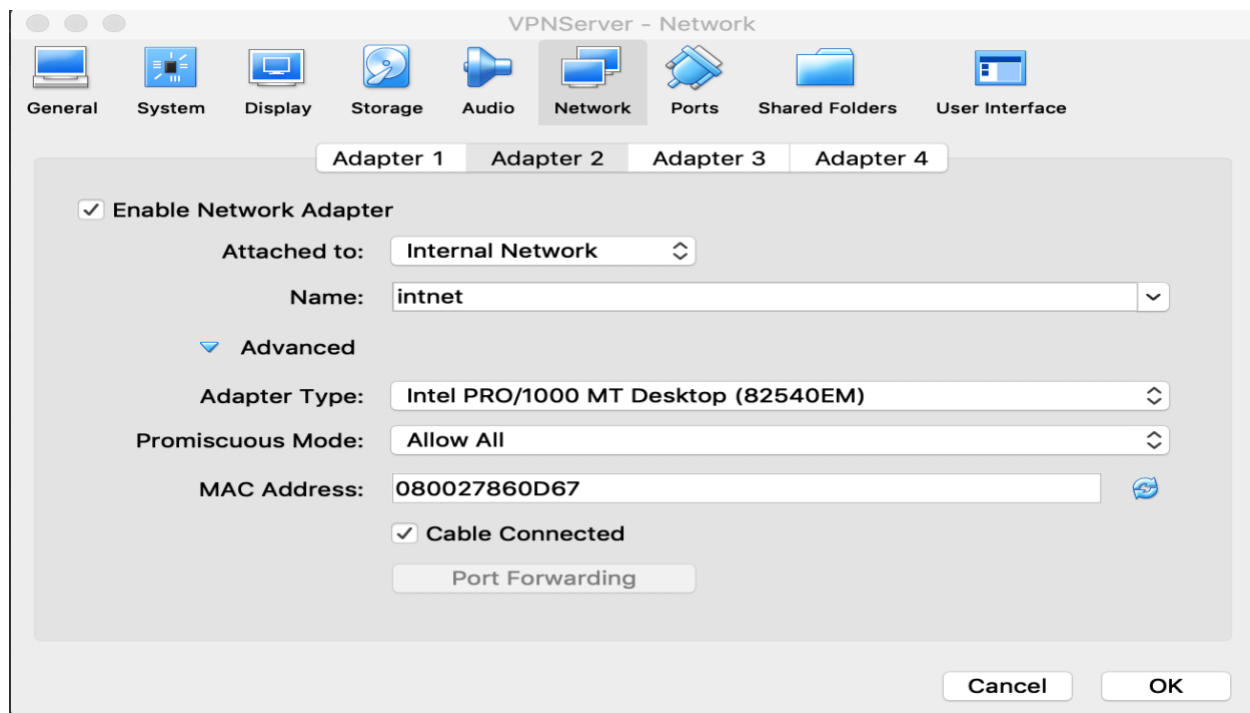
```
[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3  Link encap:Ethernet  HWaddr 08:00:27:b8:d2:54
        inet addr:10.0.2.10  Bcast:10.0.2.255  Mask:255.255.255.0
        inet6 addr: fe80::15fe:e068:d62a:5e2/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:92 errors:0 dropped:0 overruns:0 frame:0
        TX packets:143 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:76765 (76.7 KB)  TX bytes:14848 (14.8 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:87 errors:0 dropped:0 overruns:0 frame:0
        TX packets:87 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1
        RX bytes:23279 (23.2 KB)  TX bytes:23279 (23.2 KB)
```

The VPN client will only have one connection that is the NAT Network connection. The IP address of VPN client (HOST U) machine is 10.0.2.10

VPN SERVER





```
[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3  Link encap:Ethernet  HWaddr 08:00:27:eb:ea:2c
        inet addr:10.0.2.11  Bcast:10.0.2.255  Mask:255.255.255.0
        inet6 addr: fe80::3663:338:13db:b379/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:2 errors:0 dropped:0 overruns:0 frame:0
        TX packets:58 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:696 (696.0 B)  TX bytes:6738 (6.7 KB)

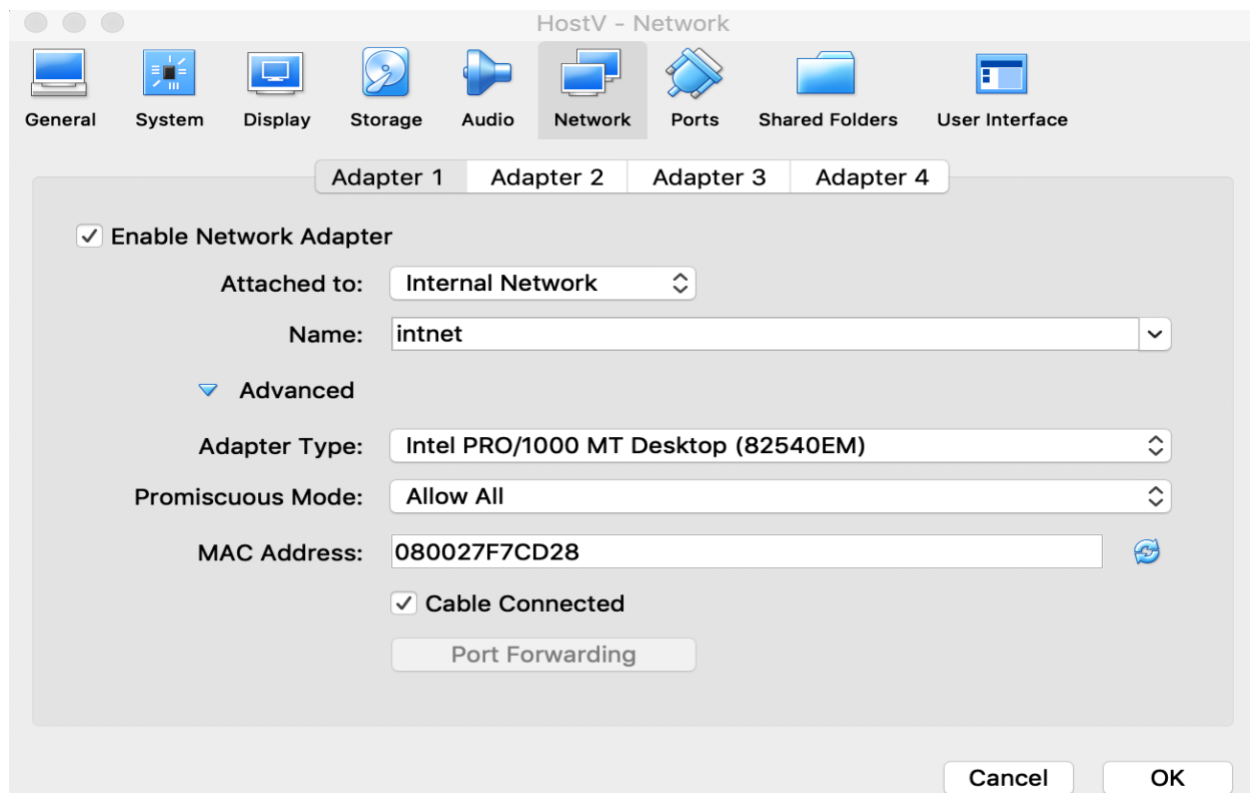
enp0s8  Link encap:Ethernet  HWaddr 08:00:27:86:0d:67
        inet addr:192.168.60.1  Bcast:192.168.60.255  Mask:255.255.255.0
        inet6 addr: fe80::8cf1:6faa:4bcf:d7aa/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:0 errors:0 dropped:0 overruns:0 frame:0
        TX packets:74 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:0 (0.0 B)  TX bytes:7525 (7.5 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:96 errors:0 dropped:0 overruns:0 frame:0
        TX packets:96 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1
        RX bytes:24282 (24.2 KB)  TX bytes:24282 (24.2 KB)
```

The VPN server will have two connections one is the NAT Network connection and the other is the Internal Network connection which will connect the VPN server with HOST V.

The NAT Network connection the IP address is 10.0.2.11

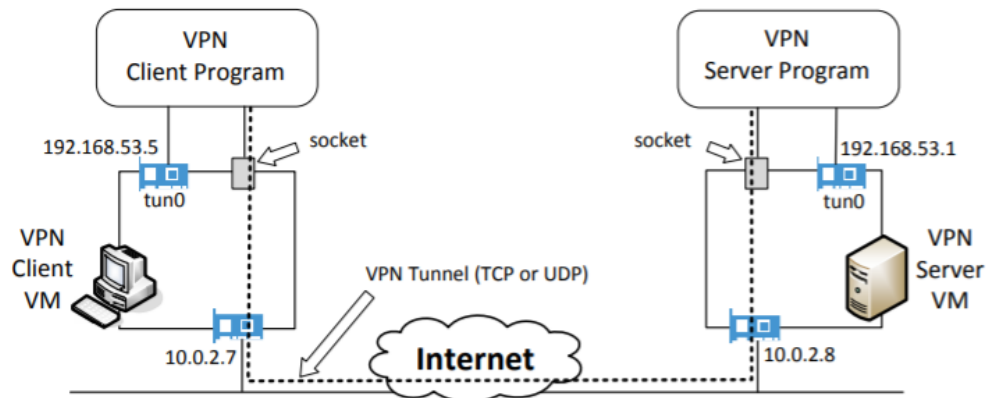
the Internal Network connection the IP address is 192.168.60.1

HOST V

```
[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3  Link encap:Ethernet  HWaddr 08:00:27:f7:cd:28
        inet addr:192.168.60.101  Bcast:192.168.60.255  Mask:255.255.255.0
        inet6 addr: fe80::fea:b95d:dad9:d35f/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:2 errors:0 dropped:0 overruns:0 frame:0
        TX packets:247 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:120 (120.0 B)  TX bytes:29339 (29.3 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:142 errors:0 dropped:0 overruns:0 frame:0
        TX packets:142 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1
        RX bytes:17848 (17.8 KB)  TX bytes:17848 (17.8 KB)
```

The HOST V which is connected to the VPN server is on the Internal Network and the has the IP address 192.168.60.101

TASK 2: Creating a VPN Tunnel using TUN/TAP**Step 1: Run VPN Server**

```
[03/31/19]\Shenava@VM:~/.../VPN$ gedit vpnserver.c
[03/31/19]\Shenava@VM:~/.../VPN$ ls
vpnserver.c
[03/31/19]\Shenava@VM:~/.../VPN$ gcc -o vpnserver vpnserver.c
[03/31/19]\Shenava@VM:~/.../VPN$ sudo ./vpnserver
[sudo] password for seed:
```

```
[03/31/19]\Shenava@VM:~$ sudo ifconfig tun0 192.168.53.1/24 up
[sudo] password for seed:
[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3      Link encap:Ethernet  HWaddr 08:00:27:eb:ea:2c
            inet addr:10.0.2.11  Bcast:10.0.2.255  Mask:255.255.255.0
            inet6 addr: fe80::3663:338:13db:b379/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
            RX packets:8 errors:0 dropped:0 overruns:0 frame:0
            TX packets:66 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:2720 (2.7 KB)  TX bytes:7722 (7.7 KB)

enp0s8      Link encap:Ethernet  HWaddr 08:00:27:86:0d:67
            inet addr:192.168.60.1  Bcast:192.168.60.255  Mask:255.255.255.0
            inet6 addr: fe80::8cf1:6faa:4bcf:d7aa/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
            RX packets:374 errors:0 dropped:0 overruns:0 frame:0
            TX packets:87 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:40164 (40.1 KB)  TX bytes:8527 (8.5 KB)

lo          Link encap:Local Loopback
            inet addr:127.0.0.1  Mask:255.0.0.0
            inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING  MTU:65536  Metric:1
            RX packets:164 errors:0 dropped:0 overruns:0 frame:0
            TX packets:164 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:36957 (36.9 KB)  TX bytes:36957 (36.9 KB)

tun0
-00         Link encap:UNSPEC  HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
            inet addr:192.168.53.1  P-t-P:192.168.53.1  Mask:255.255.255.0
            inet6 addr: fe80::696f:31be:3c24:e353/64 Scope:Link
            UP POINTOPOINT RUNNING NOARP MULTICAST  MTU:1500  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
```

We run the VPN server using the `./vpnserv` command then on a new terminal or window we run a command to set up the IP address to the `tun0` interface. Since the VPN server needs to forward packets between the private network and the tunnel, it needs to act as a gateway. Hence, we enable IP forwarding on the server machine for it to act as a gateway.

```
[03/31/19]\Shenava@VM:~$ sudo sysctl net.ipv4.ip_forward=1
net.ipv4.ip_forward = 1
[03/31/19]\Shenava@VM:~$ █
```


Step 2: Run VPN Client.

```
[03/31/19]\Shenava@VM:~/.../VPN$ gedit vpnclient.c
[03/31/19]\Shenava@VM:~/.../VPN$ ls
vpnclient.c
[03/31/19]\Shenava@VM:~/.../VPN$ gcc -o vpnclient vpnclient.c
[03/31/19]\Shenava@VM:~/.../VPN$ sudo ./vpnclient 10.0.2.11
[sudo] password for seed:
Got a packet from the tunnel
Got a packet from the tunnel
Got a packet from the tunnel
```

We run the vpn client program using `./vpnclient <server_ip>`. On a new window we run a command to assign the IP address to the tun0 interface as seen below.

```
[03/31/19]\Shenava@VM:~$ sudo ifconfig tun0 192.168.53.5/24 up
[sudo] password for seed:
[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3      Link encap:Ethernet  HWaddr 08:00:27:b8:d2:54
            inet addr:10.0.2.10  Bcast:10.0.2.255  Mask:255.255.255.0
            inet6 addr: fe80::15fe:e068:d62a:5e2/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
            RX packets:412 errors:0 dropped:0 overruns:0 frame:0
            TX packets:173 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:125903 (125.9 KB)  TX bytes:18113 (18.1 KB)

lo          Link encap:Local Loopback
            inet addr:127.0.0.1  Mask:255.0.0.0
            inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING  MTU:65536  Metric:1
            RX packets:220 errors:0 dropped:0 overruns:0 frame:0
            TX packets:220 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:31331 (31.3 KB)  TX bytes:31331 (31.3 KB)

tun0        Link encap:UNSPEC  HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
-00
            inet addr:192.168.53.5  P-t-P:192.168.53.5  Mask:255.255.255.0
            inet6 addr: fe80::17d0:5c96:403d:f322/64 Scope:Link
            UP POINTOPOINT RUNNING NOARP MULTICAST  MTU:1500  Metric:1
            RX packets:0 errors:0 dropped:0 overruns:0 frame:0
            TX packets:1 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:500
            RX bytes:0 (0.0 B)  TX bytes:48 (48.0 B)
```

Step 3: Set Up Routing on Client and Server VMs

We set up the routing paths on both the client and server machine as shown below.

```
[03/31/19]\Shenava@VM:~$ sudo route add -net 10.0.2.0/24 enp0s3
[03/31/19]\Shenava@VM:~$ route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
default          192.168.60.1   0.0.0.0         UG    100    0      0 enp0s8
default          10.0.2.1       0.0.0.0         UG    101    0      0 enp0s3
10.0.2.0         *              255.255.255.0   U     0      0      0 enp0s3
10.0.2.0         *              255.255.255.0   U     100    0      0 enp0s3
link-local       *              255.255.0.0     U     1000   0      0 enp0s8
192.168.53.0     *              255.255.255.0   U     0      0      0 tun0
192.168.60.0     *              255.255.255.0   U     100    0      0 enp0s8
[03/31/19]\Shenava@VM:~$ ping 192.168.53.5 -c3
PING 192.168.53.5 (192.168.53.5) 56(84) bytes of data.
64 bytes from 192.168.53.5: icmp_seq=1 ttl=64 time=0.634 ms
64 bytes from 192.168.53.5: icmp_seq=2 ttl=64 time=1.33 ms
64 bytes from 192.168.53.5: icmp_seq=3 ttl=64 time=1.03 ms

--- 192.168.53.5 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2025ms
rtt min/avg/max/mdev = 0.634/1.002/1.335/0.289 ms
[03/31/19]\Shenava@VM:~$
```

```
[03/31/19]\Shenava@VM:~$ route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
default          10.0.2.1       0.0.0.0         UG    100    0      0 enp0s3
10.0.2.0         *              255.255.255.0   U     100    0      0 enp0s3
link-local       *              255.255.0.0     U     1000   0      0 enp0s3
192.168.53.0     *              255.255.255.0   U     0      0      0 tun0
[03/31/19]\Shenava@VM:~$
```

Step 4: Set Up Routing on Host V

```
[03/31/19]\Shenava@VM:~$ sudo route add -net 10.0.2.0/24 enp0s3
[sudo] password for seed:
[03/31/19]\Shenava@VM:~$ route
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
default          192.168.60.1   0.0.0.0         UG    100    0      0 enp0s3
10.0.2.0         *              255.255.255.0   U     0      0      0 enp0s3
link-local       *              255.255.0.0     U     1000   0      0 enp0s3
192.168.60.0     *              255.255.255.0   U     100    0      0 enp0s3
```

In the Host V we add the route as 10.0.2.0 through the client connection path which is in this case enp0s3.


```
[03/31/19]\Shenava@VM:~$ sudo route add -net 192.168.60.0/24 tun0
[03/31/19]\Shenava@VM:~$ route
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
default          10.0.2.1         0.0.0.0          UG    100    0      0 enp0s3
10.0.2.0         *                255.255.255.0    U      0      0      0 enp0s3
10.0.2.0         *                255.255.255.0    U     100    0      0 enp0s3
link-local       *                255.255.0.0      U     1000   0      0 enp0s3
192.168.53.0     *                255.255.255.0    U      0      0      0 tun0
192.168.60.0     *                255.255.255.0    U      0      0      0 tun0
[03/31/19]\Shenava@VM:~$
```

In the Host U machine or the client machine we setup and add the route 192.168.60.0 through tun0 interface.

```
[03/31/19]\Shenava@VM:~$ ping 192.168.53.5 -c3
PING 192.168.53.5 (192.168.53.5) 56(84) bytes of data.
64 bytes from 192.168.53.5: icmp_seq=1 ttl=64 time=0.634 ms
64 bytes from 192.168.53.5: icmp_seq=2 ttl=64 time=1.33 ms
64 bytes from 192.168.53.5: icmp_seq=3 ttl=64 time=1.03 ms

--- 192.168.53.5 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2025ms
rtt min/avg/max/mdev = 0.634/1.002/1.335/0.289 ms
```

Then we ping the client machine to check if our connection is active or not.

Step 5: Test the VPN Tunnel

```
[03/31/19]\Shenava@VM:~$ ping 192.168.60.101 -c3
PING 192.168.60.101 (192.168.60.101) 56(84) bytes of data.
64 bytes from 192.168.60.101: icmp_seq=1 ttl=63 time=1.18 ms
64 bytes from 192.168.60.101: icmp_seq=2 ttl=63 time=1.93 ms
64 bytes from 192.168.60.101: icmp_seq=3 ttl=63 time=1.58 ms

--- 192.168.60.101 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 1.189/1.569/1.931/0.306 ms
[03/31/19]\Shenava@VM:~$
```

After we set the route, we ping and telnet the private network that is the Host V. The traffic is captured and shows the connection is established from client to Host V as shown below in the Wireshark screenshot

No.	Time	Source	Destination	Protocol	Length	Info
1	2019-03-31 13:55:36.7852072...	:::1	:::1	UDP	64	48308 → 44616 Len=0
2	2019-03-31 13:55:36.9400148...	192.168.53.5	192.168.60.101	ICMP	100	Echo (ping) request id=0x0da7, seq=1/256, ttl=64 (repl...
3	2019-03-31 13:55:36.9400457...	10.0.2.10	10.0.2.11	UDP	128	47689 → 55555 Len=84
4	2019-03-31 13:55:36.9412082...	10.0.2.11	10.0.2.10	UDP	128	55555 → 47689 Len=84
5	2019-03-31 13:55:36.9412037...	192.168.60.101	192.168.53.5	ICMP	100	Echo (ping) reply id=0x0da7, seq=1/256, ttl=63 (requ...
6	2019-03-31 13:55:37.9416874...	192.168.53.5	192.168.60.101	ICMP	100	Echo (ping) request id=0x0da7, seq=2/512, ttl=64 (repl...
7	2019-03-31 13:55:37.9417369...	10.0.2.10	10.0.2.11	UDP	128	47689 → 55555 Len=84
8	2019-03-31 13:55:37.9433310...	10.0.2.11	10.0.2.10	UDP	128	55555 → 47689 Len=84
9	2019-03-31 13:55:37.9434479...	192.168.60.101	192.168.53.5	ICMP	100	Echo (ping) reply id=0x0da7, seq=2/512, ttl=63 (requ...
10	2019-03-31 13:55:38.9440216...	192.168.53.5	192.168.60.101	ICMP	100	Echo (ping) request id=0x0da7, seq=3/768, ttl=64 (repl...
11	2019-03-31 13:55:38.9440748...	10.0.2.10	10.0.2.11	UDP	128	47689 → 55555 Len=84
12	2019-03-31 13:55:38.9449310...	10.0.2.11	10.0.2.10	UDP	128	55555 → 47689 Len=84
13	2019-03-31 13:55:38.9449864...	192.168.60.101	192.168.53.5	ICMP	100	Echo (ping) reply id=0x0da7, seq=3/768, ttl=63 (requ...

▶ Frame 5: 100 bytes on wire (800 bits), 100 bytes captured (800 bits) on interface 0
 ▶ Linux cooked capture
 ▶ Internet Protocol Version 4, Src: 192.168.60.101, Dst: 192.168.53.5
 ▶ Internet Control Message Protocol

```
[03/31/19]\Shenava@VM:~$ telnet 192.168.60.101
Trying 192.168.60.101...
Connected to 192.168.60.101.
Escape character is '^]'.
Ubuntu 16.04.2 LTS
VM login: seed
Password:
Last login: Sun Mar 31 13:49:36 EDT 2019 from 192.168.60.1 on pts/17
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.8.0-36-generic i686)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

3 packages can be updated.
0 updates are security updates.

[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3    Link encap:Ethernet  HWaddr 08:00:27:f7:cd:28
          inet addr:192.168.60.101  Bcast:192.168.60.255  Mask:255.255.255.0
          inet6 addr: fe80::fea:b95d:dad9:d35f/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:195 errors:0 dropped:0 overruns:0 frame:0
          TX packets:516 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:13332 (13.3 KB)  TX bytes:53298 (53.2 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:333 errors:0 dropped:0 overruns:0 frame:0
          TX packets:333 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:37718 (37.7 KB)  TX bytes:37718 (37.7 KB)

[03/31/19]\Shenava@VM:~$ █
```

We see our telnet is also successful.

Step 6: Tunnel-Breaking Test

```
[03/31/19]\Shenava@VM:~$ telnet 192.168.60.101
Trying 192.168.60.101...
Connected to 192.168.60.101.
Escape character is '^]'.
Ubuntu 16.04.2 LTS
VM login: seed
Password:
Last login: Sun Mar 31 13:49:36 EDT 2019 from 192.168.60.1 on pts/17
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.8.0-36-generic i686)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

3 packages can be updated.
0 updates are security updates.

[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3      Link encap:Ethernet  HWaddr 08:00:27:f7:cd:28
            inet addr:192.168.60.101  Bcast:192.168.60.255  Mask:255.255.255.0
            inet6 addr: fe80::fea:b95d:dad9:d35f/64 Scope:Link
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
            RX packets:195 errors:0 dropped:0 overruns:0 frame:0
            TX packets:516 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:13332 (13.3 KB)  TX bytes:53298 (53.2 KB)

lo          Link encap:Local Loopback
            inet addr:127.0.0.1  Mask:255.0.0.0
            inet6 addr: ::1/128 Scope:Host
            UP LOOPBACK RUNNING  MTU:65536  Metric:1
            RX packets:333 errors:0 dropped:0 overruns:0 frame:0
            TX packets:333 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:37718 (37.7 KB)  TX bytes:37718 (37.7 KB)

[03/31/19]\Shenava@VM:~$ █
```

We telnet the HOST V machine which is on the private network from the client machine. Once the telnet is succeeded, we get access to the Host V machine and are in that machine.

We run the ifconfig command to check we have access to the Host V through client machine and we see the telnet connection is still active and connection has established.


```

Got a packet from TUN
Got a packet from the tunnel
^C
[03/31/19]\Shenava@VM:~/.../VPN$ sudo ./vpnserv
[sudo] password for seed:
Connected with the client: E[00]
Got a packet from TUN
Got a packet from TUN
Got a packet from the tunnel
Got a packet from TUN
Got a packet from the tunnel
Got a packet from TUN
Got a packet from the tunnel
Got a packet from TUN

```

Now, we break the tunnel on the server side. We break the vpn server program that is running in the background just by “ctrl + C” when we go back to our client machine and try to type on the screen, we see the screen is frozen. Hence, we can just try typing some gibberish values. Though it is not visible, we’ll see what happens once the server tunnel is up. Therefore, we run the vpn server program and do tun up to bring up the tunnel connection and tun0 interface.

```

[03/31/19]\Shenava@VM:~$ ifconfig
enp0s3  Link encap:Ethernet  HWaddr 08:00:27:f7:cd:28
        inet addr:192.168.60.101  Bcast:192.168.60.255  Mask:255.255.255.0
        inet6 addr: fe80::fea:b95d:dad9:d35f/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
        RX packets:195 errors:0 dropped:0 overruns:0 frame:0
        TX packets:516 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:13332 (13.3 KB)  TX bytes:53298 (53.2 KB)

lo      Link encap:Local Loopback
        inet addr:127.0.0.1  Mask:255.0.0.0
        inet6 addr: ::1/128 Scope:Host
        UP LOOPBACK RUNNING  MTU:65536  Metric:1
        RX packets:333 errors:0 dropped:0 overruns:0 frame:0
        TX packets:333 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1
        RX bytes:37718 (37.7 KB)  TX bytes:37718 (37.7 KB)

[03/31/19]\Shenava@VM:~$ dgytryedegf

```

In the above screenshot we see that the gibberish value that was typed is now visible. Once the tun0 interface is set and tunnel is build up again the values that we typed will appear and the client machine will still be connected to the Host V machine.

When we break the server connection the tunnel is broken but the client is still connected to the Host V but will not be able to type anything on the Host V machine. Anything typed while the tunnel is broken goes to buffer and gets stored. When the tunnel is up the typed values which is stored in the buffer gets displayed.