

Experiments 1

- Run `sudo ./main --interface enp0s3 -c 4 --filter icmp` on VM1
- Run `ping 10.0.2.15 -c 3` on VM1

VM 1

```
nscap2@nscap2:~/Network-Systems-Capstone/hw1$ ping 10.0.2.15 -c 3
PING 10.0.2.15 (10.0.2.15) 56(84) bytes of data.
64 bytes from 10.0.2.15: icmp_seq=1 ttl=64 time=1.31 ms
64 bytes from 10.0.2.15: icmp_seq=2 ttl=64 time=0.882 ms
64 bytes from 10.0.2.15: icmp_seq=3 ttl=64 time=1.56 ms

--- 10.0.2.15 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2017ms
rtt min/avg/max/mdev = 0.882/1.250/1.560/0.279 ms
```

Result

```
nscap2@nscap2:~/Network-Systems-Capstone/hw1$ sudo ./main --inter
face enp0s3 -c 4 --filter icmp
[sudo] password for nscap2:
Transport type: ICMP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
ICMP type value: 8

Transport type: ICMP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
ICMP type value: 0

Transport type: ICMP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
ICMP type value: 8

Transport type: ICMP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
ICMP type value: 0
```

Experiments 2

- Run `sudo ./main --count 20 -f all -i enp0s3` on VM1
- Run `ping 10.0.2.15 -c 1` on VM1
- VM1 should send three UDP packets to VM2.
 - First packet: 5555555555555555
 - Second packet: 7777777777777777
 - Third packet: 8888888888888888
- VM1 should send the file `sample_file.txt` to VM2 using the python socket module and TCP protocol. (Server port: 8888, Client port: 7777)

VM 1

```
nscap2@nscap2:~/Network-Systems-Capstone/hw1$ ping 10.0.2.15 -c 1
PING 10.0.2.15 (10.0.2.15) 56(84) bytes of data.
64 bytes from 10.0.2.15: icmp_seq=1 ttl=64 time=1.08 ms

--- 10.0.2.15 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.084/1.084/1.084/0.000 ms
nscap2@nscap2:~/Network-Systems-Capstone/hw1$ nc -u 10.0.2.15 999
9
5555555555555555
7777777777777777
8888888888888888
^C
nscap2@nscap2:~/Network-Systems-Capstone/hw1$ nc -p 8888 -t 10.0.
2.15 7777 < sample_file.txt
```

VM 2

```
nscap2@nscap2:~$ nc -l -u 9999
5555555555555555
7777777777777777
8888888888888888
^C
nscap2@nscap2:~$ nc -l -t 7777 > sample_file.txt
```

Result

```
nscap2@nscap2:~/Network-Systems-Capstone/hw1$ sudo ./main --count
20 -f all -i enp0s3
Transport type: ICMP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
ICMP type value: 8

Transport type: ICMP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
ICMP type value: 0
```

Transport type: UDP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 59283
Destination port: 9999
Payload: 35 35 35 35 35 35 35 35 35 35 35 35 35 35 35 35

Transport type: UDP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 59283
Destination port: 9999
Payload: 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37

Transport type: UDP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 59283
Destination port: 9999
Payload: 38 38 38 38 38 38 38 38 38 38 38 38 38 38 38 38

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload:

Transport type: TCP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
Source port: 7777
Destination port: 8888
Payload:

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload:

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 61 61 61 61 61 61 61 61 61 61 61 61 61 61 61 61

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 74 74 74 74 74 74 74 74 61 61 61 61 61 61 61 61

```
Transport type: TCP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
Source port: 7777
Destination port: 8888
Payload:

Transport type: TCP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
Source port: 7777
Destination port: 8888
Payload:

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 74 74 74 74 74 74 74 74 74 74 74 74 74 74 74

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 33 33 31 31 31 31 31 31 31 31 31 31 31 31 31

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33
```

```
Transport type: TCP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
Source port: 7777
Destination port: 8888
Payload:

Transport type: TCP
Source IP: 10.0.2.15
Destination IP: 10.0.2.4
Source port: 7777
Destination port: 8888
Payload:

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 63 63 63 63 63 63 63 72 72 72 72 72 72 72 72

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33

Transport type: TCP
Source IP: 10.0.2.4
Destination IP: 10.0.2.15
Source port: 8888
Destination port: 7777
Payload: 6e 6e 6e 6e 6f 6f 6f 6f 6f 6f 6f 6f 6f 6f 6f
```