LAB 2

Working with Scapy will allow the system to sniff and manipulate packets on the fly using the python environment.

IP() = will generate a ip packet with default values.

```
from scapy.all import *

a = IP()
a.show()
```

```
###[ IP ]###
  version   = 4
  ihl       = None
  tos       = 0x0
  len       = None
  id        = 1
  flags     =
  frag      = 0
  ttl       = 64
  proto     = hopopt
  chksum    = None
  src       = 127.0.0.1
  dst       = 127.0.0.1
  \options   \
```

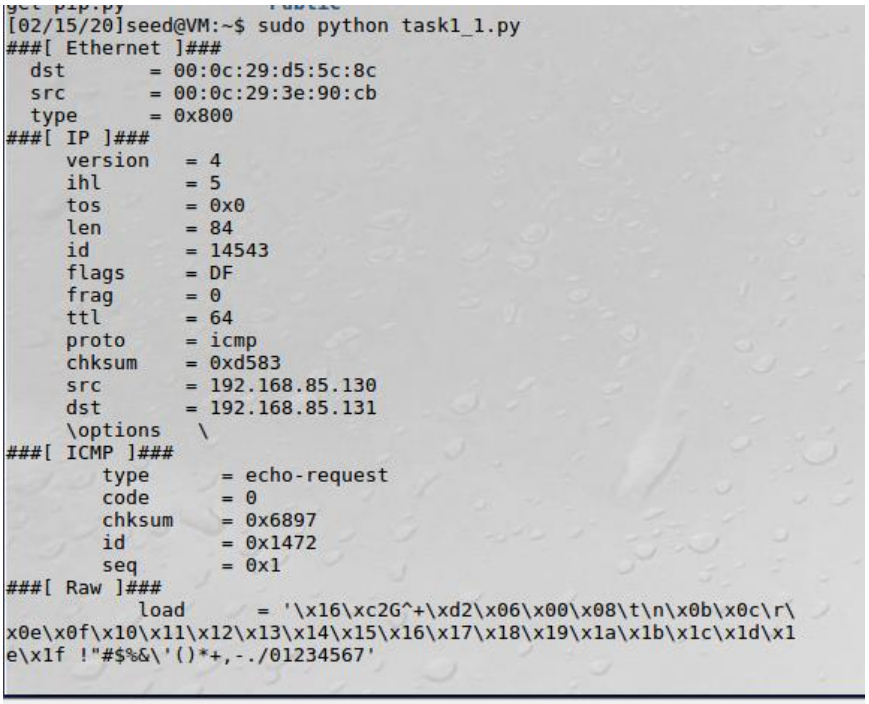
Target 1: 192.168.85.131

Target 2: 192.168.85.130

Attacker: 192.168.85.132

Task 1.1

Using the script provided in the lab, it sniffed a packet within my network. It showed a packet was sent to 192.168.85.131 from 192.168.85.130.




When I tried to use it without Super User Do Once (Sudo) It output an error. It could be that the fact it was adding BPF within the kernel which only higher privilege accounts can manipulate data within the kernel.

```
/bin/bash 66x24
        pkt.show()

pkt = sniff(filter='icmp' , prn=print_pkt)
[02/06/20]seed@VM:~$ sudo python task1_1.py
^C[02/06/20]seed@VM:~$
GNU bash, version 4.3.46(1)-release (i686-pc-linux-gnu)
[02/06/20]seed@VM:~$ nano tast.1.1py
[02/06/20]seed@VM:~$ nano task1_1.py
[02/06/20]seed@VM:~$ sudo python task1_1.py
^C[02/06/20]seed@VM:~$ python task1_1.py
Traceback (most recent call last):
  File "task1_1.py", line 8, in <module>
    pkt = sniff(filter='icmp',prn=print_pkt)
  File "/home/seed/.local/lib/python2.7/site-packages/scapy/sendre
cv.py", line 731, in sniff
    *arg, **karg)] = iface
  File "/home/seed/.local/lib/python2.7/site-packages/scapy/arch/l
inux.py", line 567, in __init__
    self.ins = socket.socket(socket.AF_PACKET, socket.SOCK_RAW, so
cket.htons(type))
  File "/usr/lib/python2.7/socket.py", line 191, in __init__
    _sock = _realsocket(family, type, proto)
socket.error: [Errno 1] Operation not permitted
[02/06/20]seed@VM:~$
```

Task 1.B

If I wanted to filter ICMP with Scapy I can do that using the sniff function and use the BPF syntax, filter=”icmp” which will sniff packets that contain ICMP in the ens33 netowrk.

```
/bin/bash 66x24
  GNU nano 2.5.3        File: listenicmp.py

from scapy.all import *

sniff(filter='icmp', count=5, iface='ens33')
```

Which will output this.

```
[02/06/20]seed@VM:~$ sudo python listenicmp.py
Searching ICMP Packets........
('Source IP:', '192.168.85.131')
('Destinatioon IP:', '192.168.85.131')
('Protocols:', 1)


('Source IP:', '192.168.85.132')
('Destinatioon IP:', '192.168.85.132')
('Protocols:', 1)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('Destinatioon IP:', '192.168.85.131')
('Protocols:', 1)


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('Destinatioon IP:', '192.168.85.132')
('Protocols:', 1)


('Source IP:', '192.168.85.131')
('Destinatioon IP:', '192.168.85.131')
('Protocols:', 1)
```

Same Goes with TCP Packets coming from Port 23.

```
[02/15/20]seed@VM:~$ sudo python listen23tcp.py
Searching TCP Packets........
('Source IP:', '192.168.85.130')
('Destinatioon IP:', '192.168.85.131')
('Protocols:', 6)


('Source IP:', '192.168.85.131')
('Destinatioon IP:', '192.168.85.130')
('Protocols:', 6)


('Source IP:', '192.168.85.130')
('Destinatioon IP:', '192.168.85.131')
('Protocols:', 6)


('Source IP:', '192.168.85.130')
('Destinatioon IP:', '192.168.85.131')
('Protocols:', 6)


('Source IP:', '192.168.85.131')
('Destinatioon IP:', '192.168.85.130')
('Protocols:', 6)


[02/15/20]seed@VM:~$
```

And a subnet from a different network that my router not evening my on my NAT, which is why its waiting for a packet from a different network.

```
[02/06/20]seed@VM:~$ sudo python listensub128.230.py
Searching Subnet
```

Task1.2

With scappy I can allow how many hops a packet can take before it talks back to the source address with the ttl variable.

Here is an example that I set the Time To Live to 1 and make it talk to my router. It seem that the TTL exceeded the amount it take to hope.

```
ARP          60 Who has 192.168.85.2? Tell 192.168.85.132
ARP          60 192.168.85.2 is at 00:50:56:e6:07:fe
ICMP         60 Echo (ping) request  id=0x0000, seq=0/0, ttl=1 (no response
ICMP         70 Time-to-live exceeded (Time to live exceeded in transit)
```

I was able to get a reply to my router once I increment the TTL to 2.

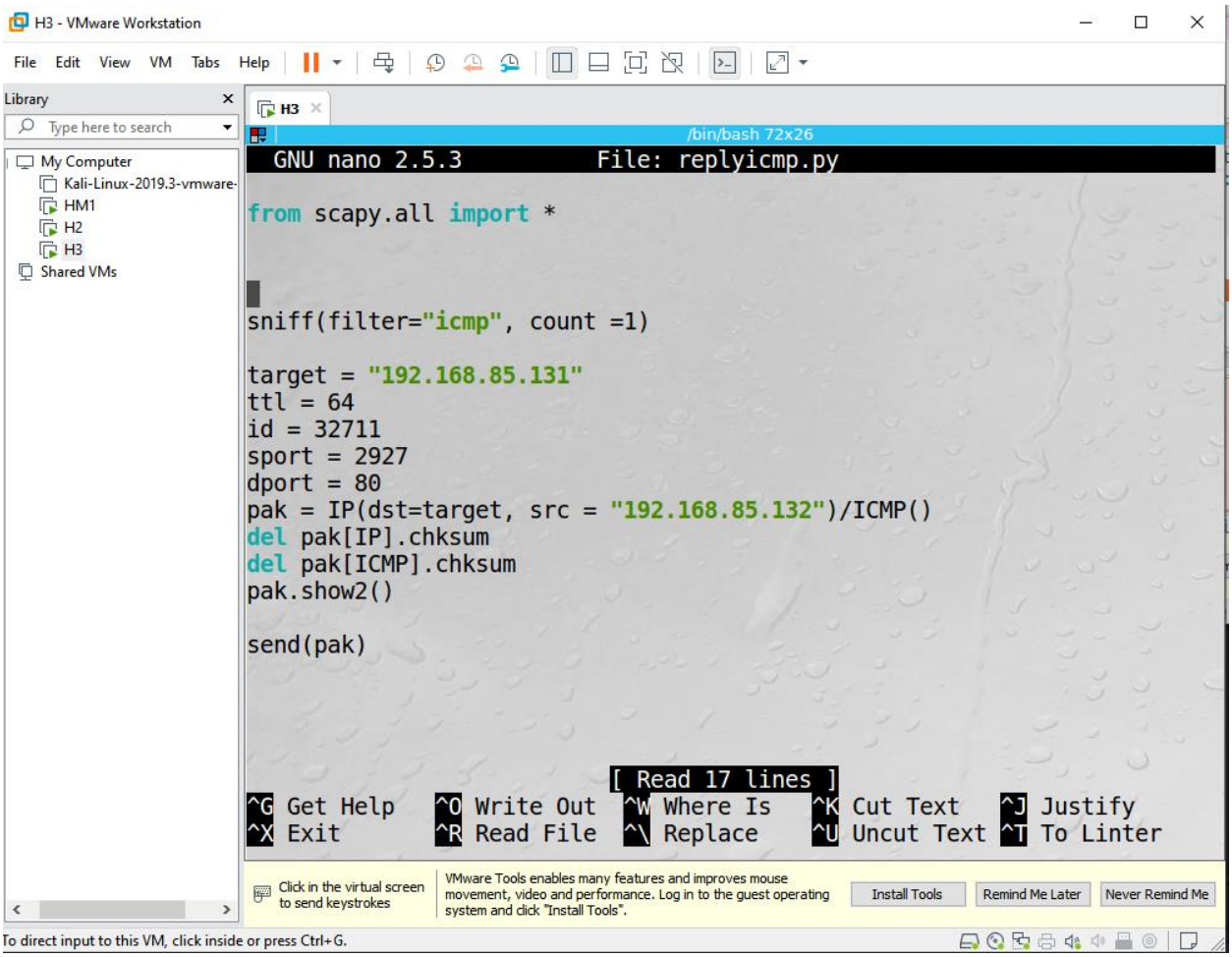
```
a = IP()

a.dst = '192.168.1.1'
a.ttl = 2
b= ICMP()
send(a/b)
```

```
ARP          60 192.168.85.2 is at 00:50:56:e6:07:fe
ICMP         60 Echo (ping) request  id=0x0000, seq=0/0, ttl=2 (reply in 5)
ICMP         60 Echo (ping) reply    id=0x0000, seq=0/0, ttl=128 (request in …
```

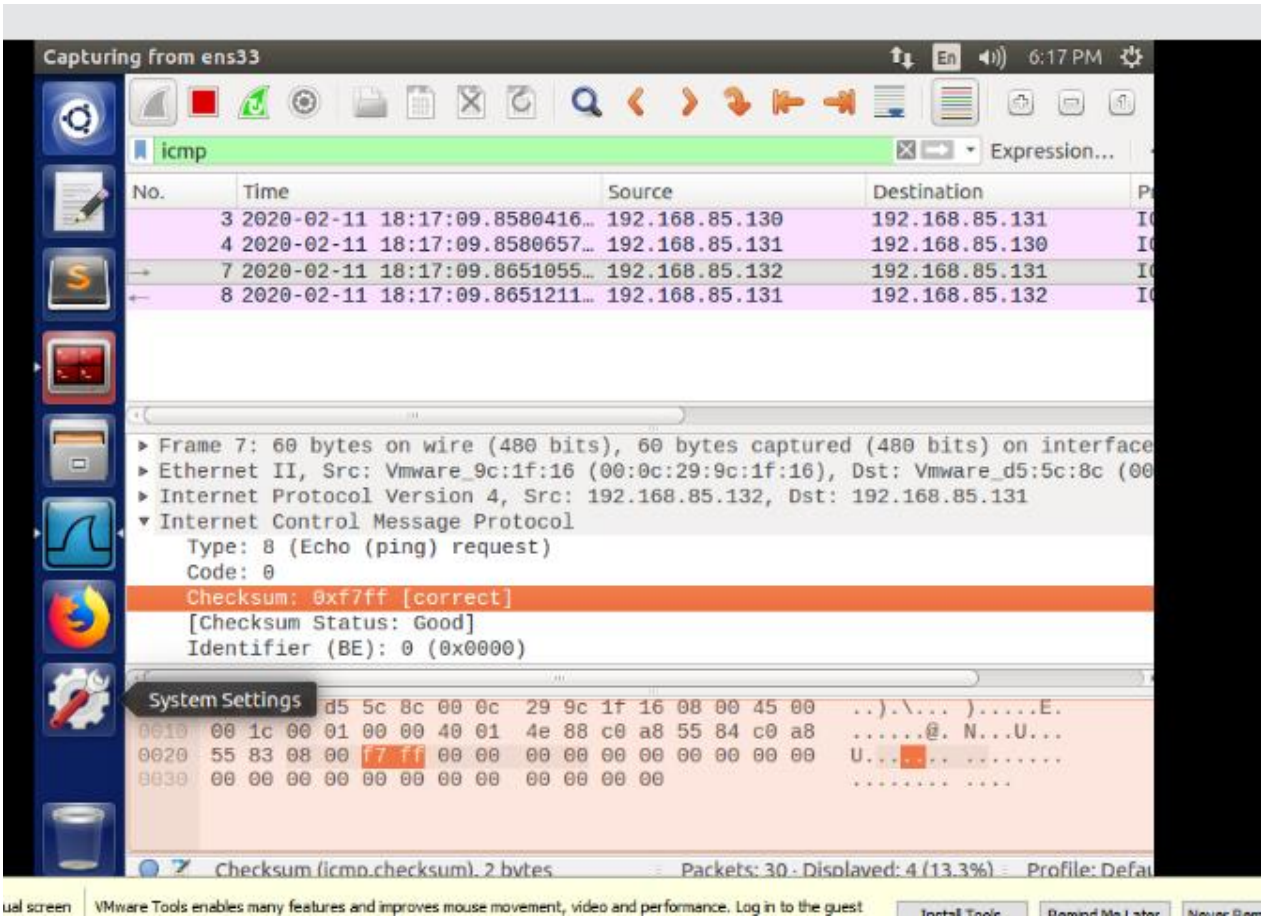
1.3

In this scenario, 192.168.85.130 is pinging request to 192.168.85.131 but the attack 192.168.85.132 will intercept a packet and echo back to x.x.x.x.131.

In the code I used the sniff packet to capture 1 packet and manipulate the source address to my address to know it was me and had to delete the chksum so the processor does t not have to validate the checksum. Then after manipulating the packet I would use the send function to send the packet.




Looking through Wireshark it looks like the attack was successfully because you can see that attacker address send a correct reply packet to the source address.


Capturing from ens33
En
6:17 PM
icmp
Expression...
No.
Time
Source
Destination
3 2020-02-11 18:17:09.8580416… 192.168.85.130 192.168.85.131
4 2020-02-11 18:17:09.8580657… 192.168.85.131 192.168.85.130
7 2020-02-11 18:17:09.8651055… 192.168.85.132 192.168.85.131
8 2020-02-11 18:17:09.8651211… 192.168.85.131 192.168.85.132
Frame 7: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface
Ethernet II, Src: Vmware_9c:1f:16 (00:0c:29:9c:1f:16), Dst: Vmware_d5:5c:8c (00
Internet Protocol Version 4, Src: 192.168.85.132, Dst: 192.168.85.131
Internet Control Message Protocol
Type: 8 (Echo (ping) request)
Code: 0
Checksum: 0xf7ff [correct]
[Checksum Status: Good]
Identifier (BE): 0 (0x0000)
System Settings
d5 5c 8c 00 0c 29 9c 1f 16 08 00 45 00 ..).\... )....E.
0010 00 1c 00 01 00 00 40 01 4e 88 c0 a8 55 84 c0 a8 ......@. N...U...
0020 55 83 08 00 f7 ff 00 00 00 00 00 00 00 00 00 00 U...... ........
0030 00 00 00 00 00 00 00 00 00 00 00 00 ........ ....
Checksum (icmp.checksum), 2 bytes
Packets: 30 · Displayed: 4 (13.3%)
Profile: Defau
ual screen
VMware Tools enables many features and improves mouse movement, video and performance. Log in to the guest