# CSCI-651 ASSIGNMENT-1 REPORT

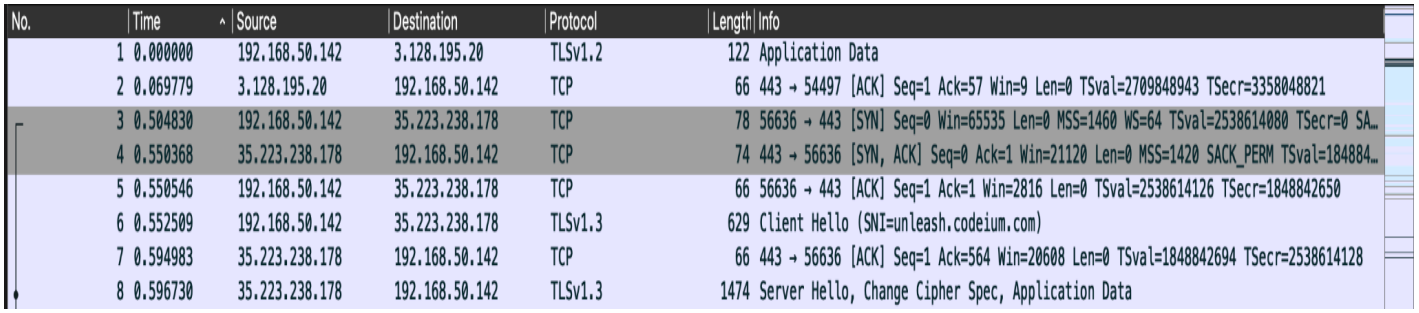
Vibudh Bhardwaj

## INTRODUCTION

This report provides a comparison of packet data by the packet sniffer python program and Wireshark. It also shows the effectiveness of filtering commands in isolating specific packet types and traffic conditions.

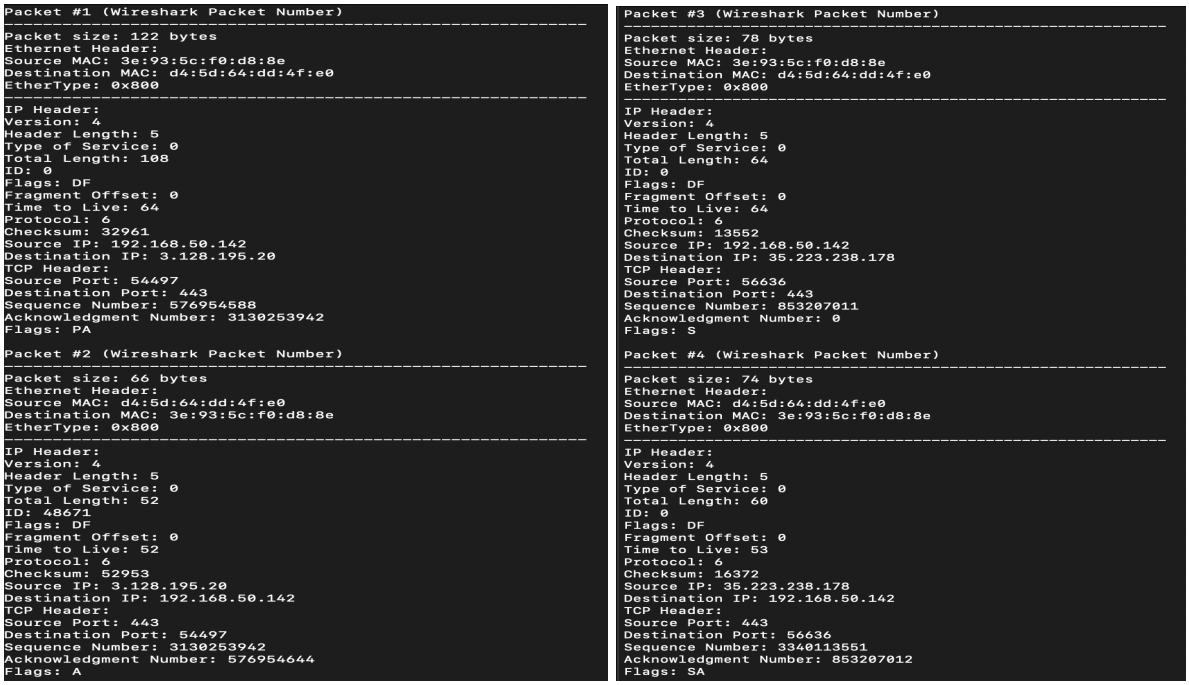
## COMPARISON

Below are screenshots comparing the first and last few packets from Wireshark and packet sniffer python program output.



| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 1 | 0.000000 | 192.168.50.142 | 3.128.195.20 | TLSv1.2 | 122 | Application Data |
| 2 | 0.069779 | 3.128.195.20 | 192.168.50.142 | TCP | 66 | 443 → 54497 [ACK] Seq=1 Ack=57 Win=9 Len=0 TSval=2709848943 TSecr=3358048821 |
| 3 | 0.504830 | 192.168.50.142 | 35.223.238.178 | TCP | 78 | 56636 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=64 TSval=2538614080 TSecr=0 SA… |
| 4 | 0.550368 | 35.223.238.178 | 192.168.50.142 | TCP | 74 | 443 → 56636 [SYN, ACK] Seq=0 Ack=1 Win=21120 Len=0 MSS=1420 SACK_PERM TSval=184884… |
| 5 | 0.550546 | 192.168.50.142 | 35.223.238.178 | TCP | 66 | 56636 → 443 [ACK] Seq=1 Ack=1 Win=2816 Len=0 TSval=2538614126 TSecr=1848842650 |
| 6 | 0.552509 | 192.168.50.142 | 35.223.238.178 | TLSv1.3 | 629 | Client Hello (SNI=unleash.codeium.com) |
| 7 | 0.594983 | 35.223.238.178 | 192.168.50.142 | TCP | 66 | 443 → 56636 [ACK] Seq=1 Ack=564 Win=20608 Len=0 TSval=1848842694 TSecr=2538614128 |
| 8 | 0.596730 | 35.223.238.178 | 192.168.50.142 | TLSv1.3 | 1474 | Server Hello, Change Cipher Spec, Application Data |

Screenshot-1: First few packets captured by Wireshark



```
Packet #1 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 122 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 108
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 32961
Source IP: 192.168.50.142
Destination IP: 3.128.195.20
TCP Header:
Source Port: 54497
Destination Port: 443
Sequence Number: 576954588
Acknowledgment Number: 3130253942
Flags: PA

Packet #2 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 66 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 52
ID: 48671
Flags: DF
Fragment Offset: 0
Time to Live: 52
Protocol: 6
Checksum: 52953
Source IP: 3.128.195.20
Destination IP: 192.168.50.142
TCP Header:
Source Port: 443
Destination Port: 54497
Sequence Number: 3130253942
Acknowledgment Number: 576954644
Flags: A
```

```
Packet #3 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 78 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 64
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 13552
Source IP: 192.168.50.142
Destination IP: 35.223.238.178
TCP Header:
Source Port: 56636
Destination Port: 443
Sequence Number: 853207011
Acknowledgment Number: 0
Flags: S

Packet #4 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 74 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 60
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 53
Protocol: 6
Checksum: 16372
Source IP: 35.223.238.178
Destination IP: 192.168.50.142
TCP Header:
Source Port: 443
Destination Port: 56636
Sequence Number: 3340113551
Acknowledgment Number: 853207012
Flags: SA
```

Screenshot-2: First few packets printed by pktsniffer.py

| | | | | | |
|---|---|---|---|---|---|
| 18982 | 24.291018 | 132.145.172.253 | 192.168.50.142 | TLSv1.3 | 125 Application Data |
| 18983 | 24.291242 | 192.168.50.142 | 132.145.172.253 | TCP | 66 50550 → 443 [ACK] Seq=114599 Ack=8805 Win=131008 Len=0 TSval=2739596547 TSecr=1009… |
| 18984 | 24.303605 | 192.168.50.142 | 17.248.168.195 | UDP | 87 52734 → 443 Len=45 |
| 18985 | 24.342504 | 192.168.50.142 | 132.145.172.253 | TLSv1.3 | 264 Application Data |
| 18986 | 24.371297 | 132.145.172.253 | 192.168.50.142 | TLSv1.3 | 125 Application Data |
| 18987 | 24.371599 | 192.168.50.142 | 132.145.172.253 | TCP | 66 50550 → 443 [ACK] Seq=114797 Ack=8864 Win=131008 Len=0 TSval=2739596628 TSecr=1009… |

Screenshot-3: Last few packets captured by Wireshark

```
Packet #18984 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 87 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 73
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 36018
Source IP: 192.168.50.142
Destination IP: 17.248.168.195
UDP Header:
Source Port: 52734
Destination Port: 443
Length: 53
Checksum: 30637

Packet #18985 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 264 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 250
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 5433
Source IP: 192.168.50.142
Destination IP: 132.145.172.253
TCP Header:
Source Port: 50550
Destination Port: 443
Sequence Number: 931679229
Acknowledgment Number: 1752454338
Flags: PA
```

```
Packet #18986 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 125 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 111
ID: 45659
Flags: DF
Fragment Offset: 0
Time to Live: 50
Protocol: 6
Checksum: 29032
Source IP: 132.145.172.253
Destination IP: 192.168.50.142
TCP Header:
Source Port: 443
Destination Port: 50550
Sequence Number: 1752454338
Acknowledgment Number: 931679427
Flags: PA

Packet #18987 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 66 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 52
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 5631
Source IP: 192.168.50.142
Destination IP: 132.145.172.253
TCP Header:
Source Port: 50550
Destination Port: 443
Sequence Number: 931679427
Acknowledgment Number: 1752454397
Flags: A
```

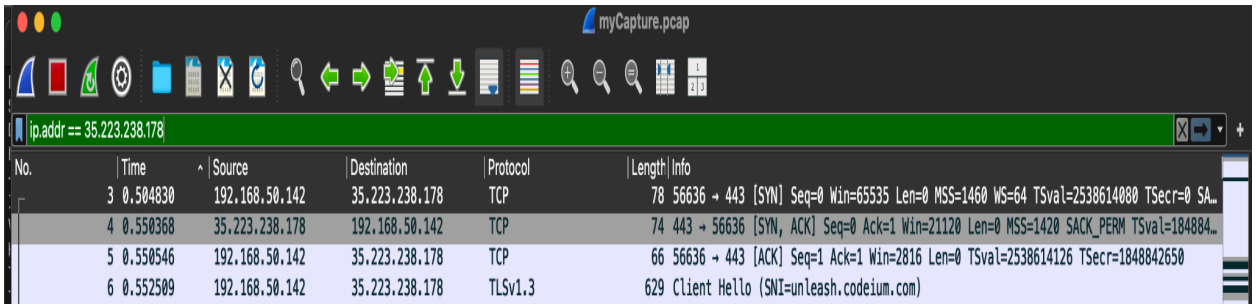
Screenshot-4: Last few packets printed by pktsniffer.py

## FILTER FUNCTIONALITIES DEMONSTRATION

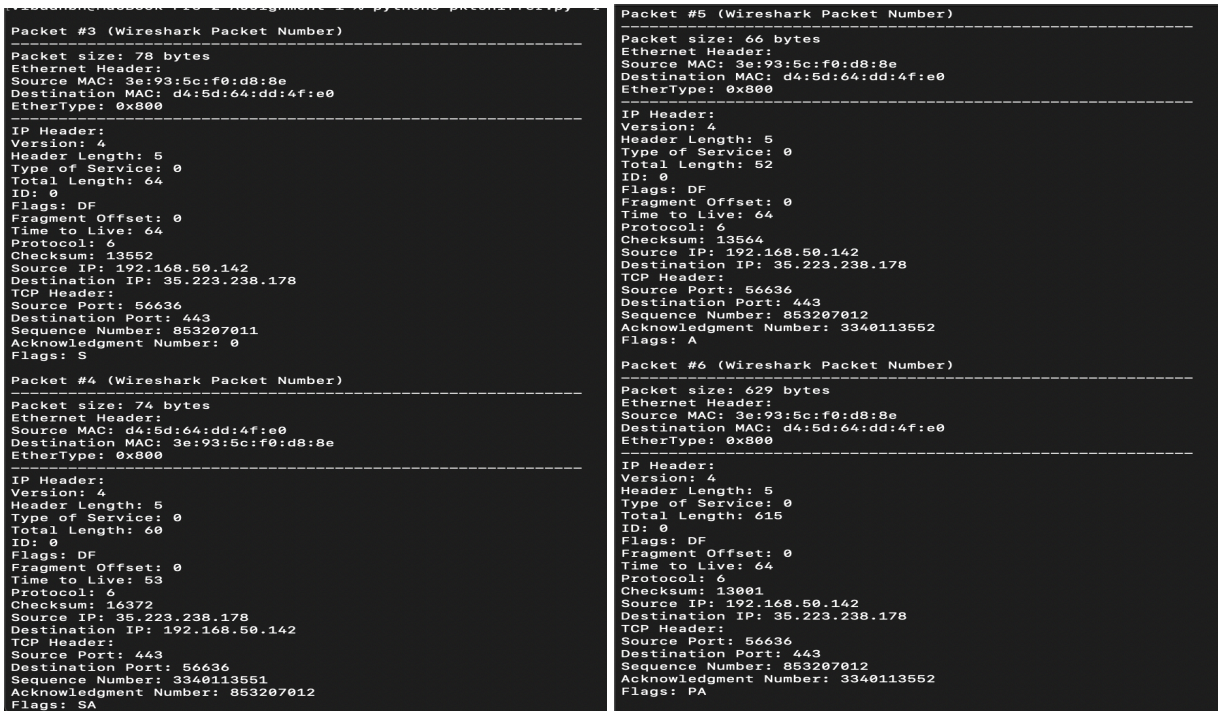
Screenshots below show how filtering commands work. They demonstrate how specific packets are excluded or included when certain flags are used.

### HOST FILTERING (-host)

Shows packets filtered by a specific host.



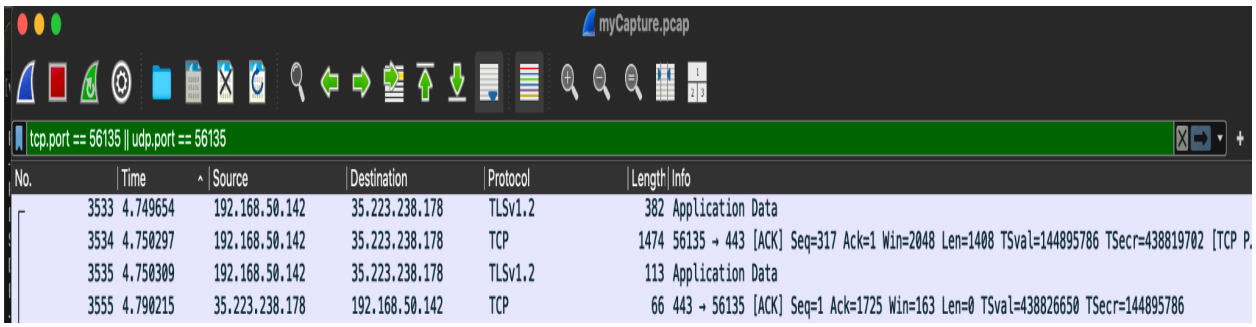

Screenshot-5: Few Filtered packets sent from or to a specific host using wireshark (*35.223.238.178*)



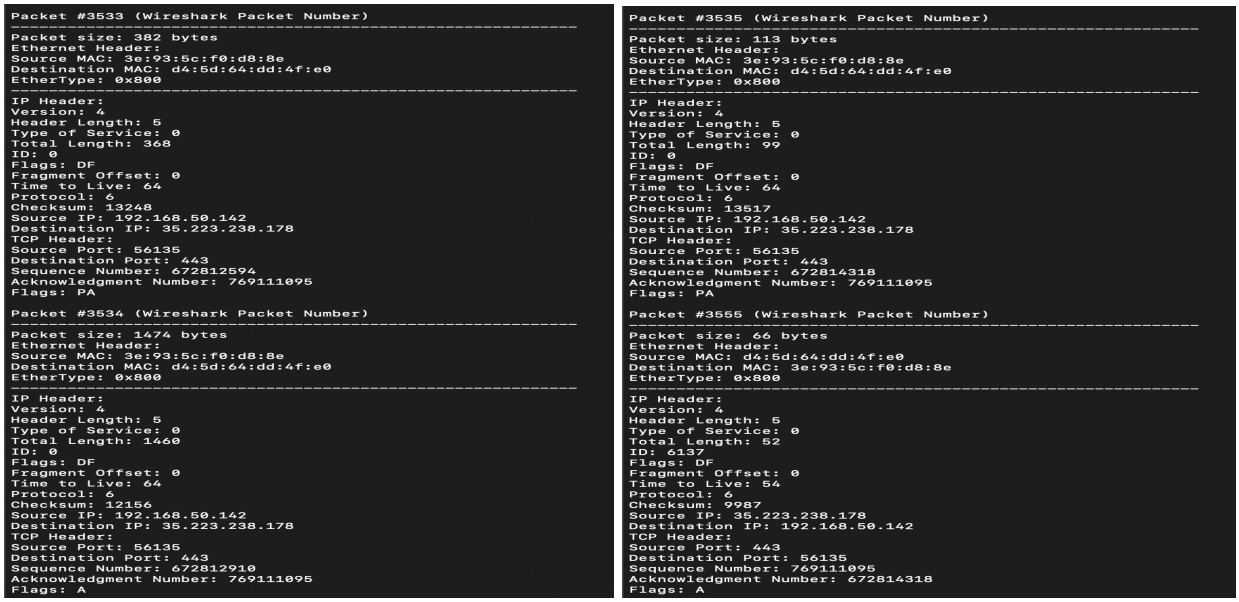

Screenshot-6: Few of the Packets filtered using pktsniffer.py using *-host 35.223.238.178* argument

## PORT FILTERING (-port)

Shows packets filtered by a specific port number.



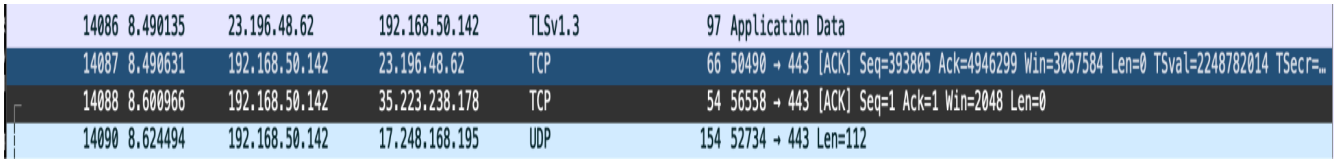

Screenshot-7: Few filtered packets with port number *56135* using Wireshark



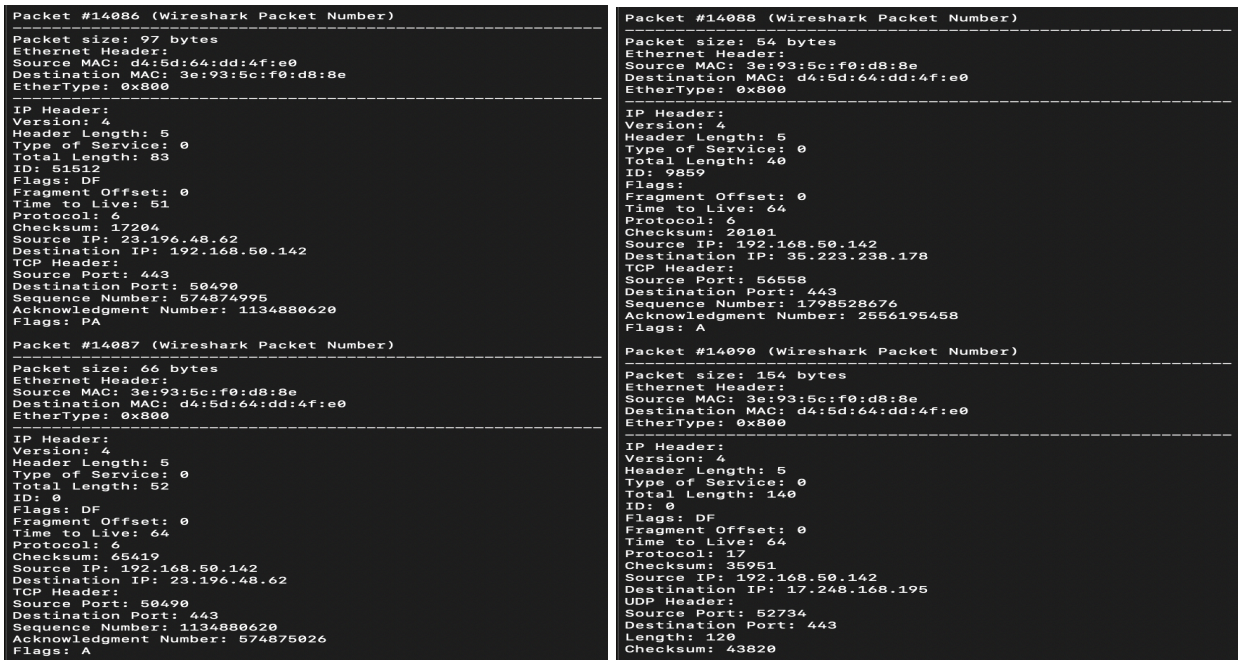

Screenshot-8: Few of the Packets filtered using pktsniffer.py using *-port 56135* argument

## IP-PACKET FILTERING (-ip)

Filters out non-IP packets, leaving only IP traffic



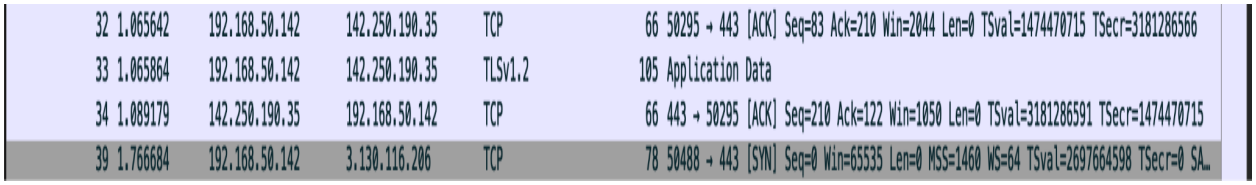

Screenshot-9: Few filtered packets showing IP-traffic using Wireshark (*#14089 filtered out*)




Screenshot-10: Few of the Packets filtered using pktsniffer.py using *-ip* argument (*#14089 filtered out*)

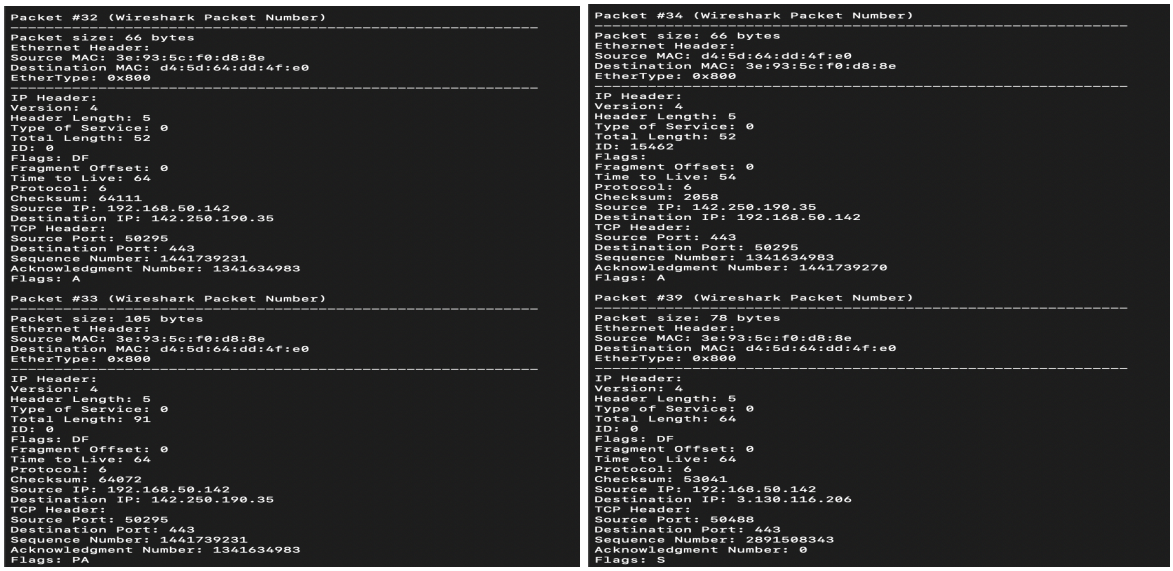
## TCP PACKET FILTERING (-tcp)

Filters to display only TCP packets.



| | | | | | |
|---|---|---|---|---|---|
| 32 | 1.065642 | 192.168.50.142 | 142.250.190.35 | TCP | 66 50295 → 443 [ACK] Seq=83 Ack=210 Win=2044 Len=0 TSval=1474470715 TSecr=3181286566 |
| 33 | 1.065864 | 192.168.50.142 | 142.250.190.35 | TLSv1.2 | 105 Application Data |
| 34 | 1.089179 | 142.250.190.35 | 192.168.50.142 | TCP | 66 443 → 50295 [ACK] Seq=210 Ack=122 Win=1050 Len=0 TSval=3181286591 TSecr=1474470715 |
| 39 | 1.766684 | 192.168.50.142 | 3.130.116.206 | TCP | 78 50488 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=64 TSval=2697664598 TSecr=0 SA… |

Screenshot-11: Few filtered packets using TCP as viewed on Wireshark (*#35-#38 filtered out*)



```
Packet #32 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 66 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 52
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 64111
Source IP: 192.168.50.142
Destination IP: 142.250.190.35
TCP Header:
Source Port: 50295
Destination Port: 443
Sequence Number: 1441739231
Acknowledgment Number: 1341634983
Flags: A

Packet #33 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 105 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 91
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 64072
Source IP: 192.168.50.142
Destination IP: 142.250.190.35
TCP Header:
Source Port: 50295
Destination Port: 443
Sequence Number: 1441739231
Acknowledgment Number: 1341634983
Flags: PA
```

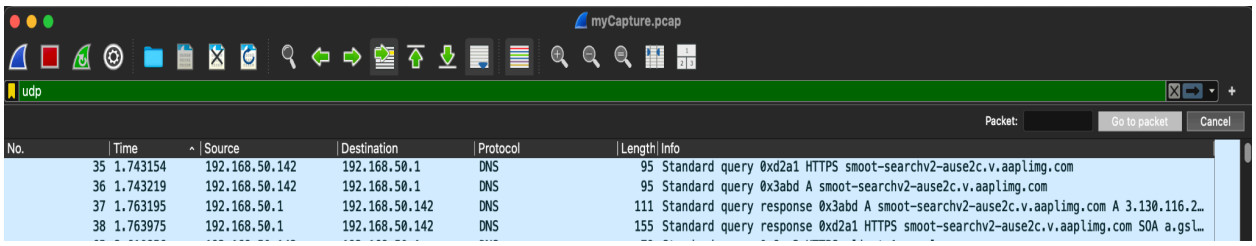
```
Packet #34 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 66 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 52
ID: 15462
Flags:
Fragment Offset: 0
Time to Live: 54
Protocol: 6
Checksum: 2058
Source IP: 142.250.190.35
Destination IP: 192.168.50.142
TCP Header:
Source Port: 443
Destination Port: 50295
Sequence Number: 1341634983
Acknowledgment Number: 1441739270
Flags: A

Packet #39 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 78 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 64
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 53041
Source IP: 192.168.50.142
Destination IP: 3.130.116.206
TCP Header:
Source Port: 50488
Destination Port: 443
Sequence Number: 2891508343
Acknowledgment Number: 0
Flags: S
```

Screenshot-12: Few of the Packets filtered using pktsniffer.py using *-tcp* argument (*#35-#38 filtered out*)

## UDP PACKET FILTERING (-udp)

Filters to display only UDP packets.




| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 35 | 1.743154 | 192.168.50.142 | 192.168.50.1 | DNS | 95 | Standard query 0xd2a1 HTTPS smoot-searchv2-ause2c.v.aaplimg.com |
| 36 | 1.743219 | 192.168.50.142 | 192.168.50.1 | DNS | 95 | Standard query 0x3abd A smoot-searchv2-ause2c.v.aaplimg.com |
| 37 | 1.763195 | 192.168.50.1 | 192.168.50.142 | DNS | 111 | Standard query response 0x3abd A smoot-searchv2-ause2c.v.aaplimg.com A 3.130.116.2… |
| 38 | 1.763975 | 192.168.50.1 | 192.168.50.142 | DNS | 155 | Standard query response 0xd2a1 HTTPS smoot-searchv2-ause2c.v.aaplimg.com SOA a.gsl… |

Screenshot-13: Few filtered packets using UDP as viewed on Wireshark

**Continued….**

```
Packet #35 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 95 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 81
ID: 40684
Flags:
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 62927
Source IP: 192.168.50.142
Destination IP: 192.168.50.1
UDP Header:
Source Port: 56636
Destination Port: 53
Length: 61
Checksum: 54821

Packet #36 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 95 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 81
ID: 60117
Flags:
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 43494
Source IP: 192.168.50.142
Destination IP: 192.168.50.1
UDP Header:
Source Port: 62626
Destination Port: 53
Length: 61
Checksum: 38564
```

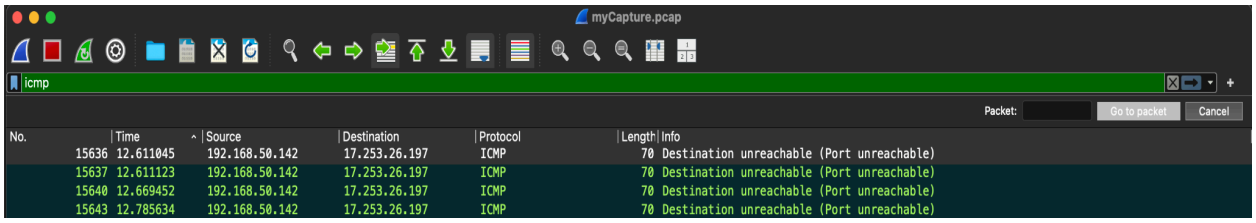
```
Packet #37 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 111 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 97
ID: 46900
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 40311
Source IP: 192.168.50.1
Destination IP: 192.168.50.142
UDP Header:
Source Port: 53
Destination Port: 62626
Length: 77
Checksum: 4298

Packet #38 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 155 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 141
ID: 46901
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 40266
Source IP: 192.168.50.1
Destination IP: 192.168.50.142
UDP Header:
Source Port: 53
Destination Port: 56636
Length: 121
Checksum: 16881
```

Screenshot-14: Few of the Packets filtered using pktsniffer.py using *-udp* argument

## ICMP PACKET FILTERING (-icmp)

Filters to display on ICMP packets.




Screenshot-15: Few filtered packets using ICMP as viewed on Wireshark

```
Packet #15636 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 70 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 56
ID: 11887
Flags:
Fragment Offset: 0
Time to Live: 64
Protocol: 1
Checksum: 11358
Source IP: 192.168.50.142
Destination IP: 17.253.26.197
ICMP Header:
Type: 3
Code: 3
Checksum: 11711

Packet #15637 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 70 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 56
ID: 64330
Flags:
Fragment Offset: 0
Time to Live: 64
Protocol: 1
Checksum: 24450
Source IP: 192.168.50.142
Destination IP: 17.253.26.197
ICMP Header:
Type: 3
Code: 3
Checksum: 11776
```

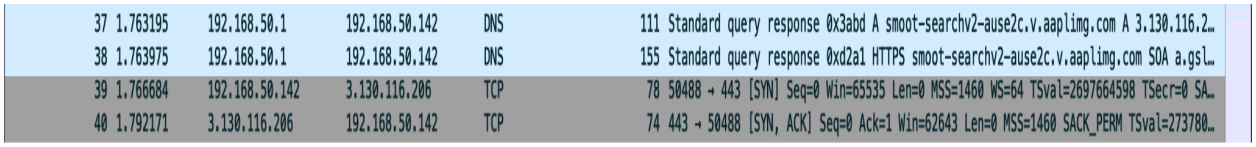
```
Packet #15640 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 70 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 56
ID: 50777
Flags:
Fragment Offset: 0
Time to Live: 64
Protocol: 1
Checksum: 38003
Source IP: 192.168.50.142
Destination IP: 17.253.26.197
ICMP Header:
Type: 3
Code: 3
Checksum: 11700

Packet #15643 (Wireshark Packet Number)
--------------------------------------------------------------------
Packet size: 70 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
--------------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 56
ID: 12735
Flags:
Fragment Offset: 0
Time to Live: 64
Protocol: 1
Checksum: 10510
Source IP: 192.168.50.142
Destination IP: 17.253.26.197
ICMP Header:
Type: 3
Code: 3
Checksum: 11700
```

Screenshot-16: Few of the Packets filtered using pktsniffer.py using *-icmp* argument

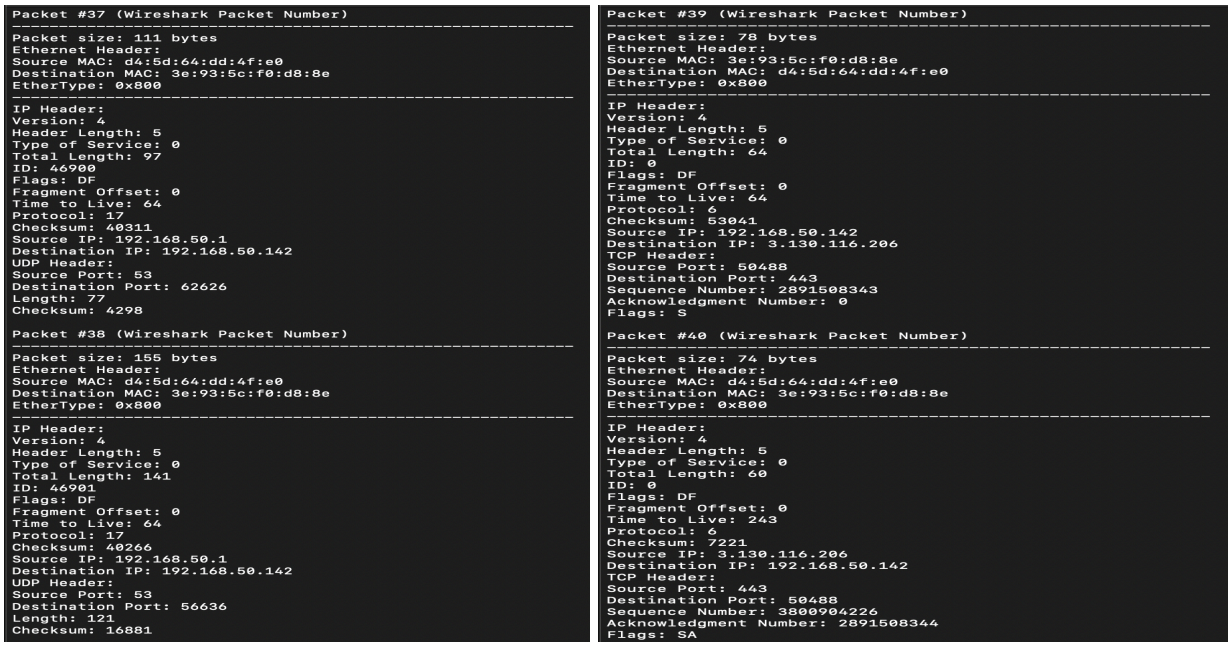
**NETWORK FILTERING (-net)**

Filters packet belonging to a specific subnet.



| | | | | | |
|---|---|---|---|---|---|
| 37 | 1.763195 | 192.168.50.1 | 192.168.50.142 | DNS | 111 Standard query response 0x3abd A smoot-searchv2-ause2c.v.aaplimg.com A 3.130.116.2… |
| 38 | 1.763975 | 192.168.50.1 | 192.168.50.142 | DNS | 155 Standard query response 0xd2a1 HTTPS smoot-searchv2-ause2c.v.aaplimg.com SOA a.gsl… |
| 39 | 1.766684 | 192.168.50.142 | 3.130.116.206 | TCP | 78 50488 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=64 TSval=2697664598 TSecr=0 SA… |
| 40 | 1.792171 | 3.130.116.206 | 192.168.50.142 | TCP | 74 443 → 50488 [SYN, ACK] Seq=0 Ack=1 Win=62643 Len=0 MSS=1460 SACK_PERM TSval=273780… |

Screenshot-17: Few filtered packets to a specific subnet (*ip.addr == 192.168.50.0/24*) as viewed on Wireshark



```
Packet #37 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 111 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 97
ID: 46900
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 40311
Source IP: 192.168.50.1
Destination IP: 192.168.50.142
UDP Header:
Source Port: 53
Destination Port: 62626
Length: 77
Checksum: 4298

Packet #38 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 155 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 141
ID: 46901
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 17
Checksum: 40266
Source IP: 192.168.50.1
Destination IP: 192.168.50.142
UDP Header:
Source Port: 53
Destination Port: 56636
Length: 121
Checksum: 16881
```

```
Packet #39 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 78 bytes
Ethernet Header:
Source MAC: 3e:93:5c:f0:d8:8e
Destination MAC: d4:5d:64:dd:4f:e0
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 64
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 64
Protocol: 6
Checksum: 53041
Source IP: 192.168.50.142
Destination IP: 3.130.116.206
TCP Header:
Source Port: 50488
Destination Port: 443
Sequence Number: 2891508343
Acknowledgment Number: 0
Flags: S

Packet #40 (Wireshark Packet Number)
------------------------------------------------------------
Packet size: 74 bytes
Ethernet Header:
Source MAC: d4:5d:64:dd:4f:e0
Destination MAC: 3e:93:5c:f0:d8:8e
EtherType: 0x800
------------------------------------------------------------
IP Header:
Version: 4
Header Length: 5
Type of Service: 0
Total Length: 60
ID: 0
Flags: DF
Fragment Offset: 0
Time to Live: 243
Protocol: 6
Checksum: 7221
Source IP: 3.130.116.206
Destination IP: 192.168.50.142
TCP Header:
Source Port: 443
Destination Port: 50488
Sequence Number: 3800904226
Acknowledgment Number: 2891508344
Flags: SA
```

Screenshot-18: Few of the Packets filtered using pktsniffer.py using *-net 192.168.50.0* argument

# CONCLUSION

This report demonstrates that the packet sniffer program correctly captures and filters packets in a manner consistent with Wireshark. The filtering commands effectively isolate specific types of traffic, showing the program's correctness and usability.