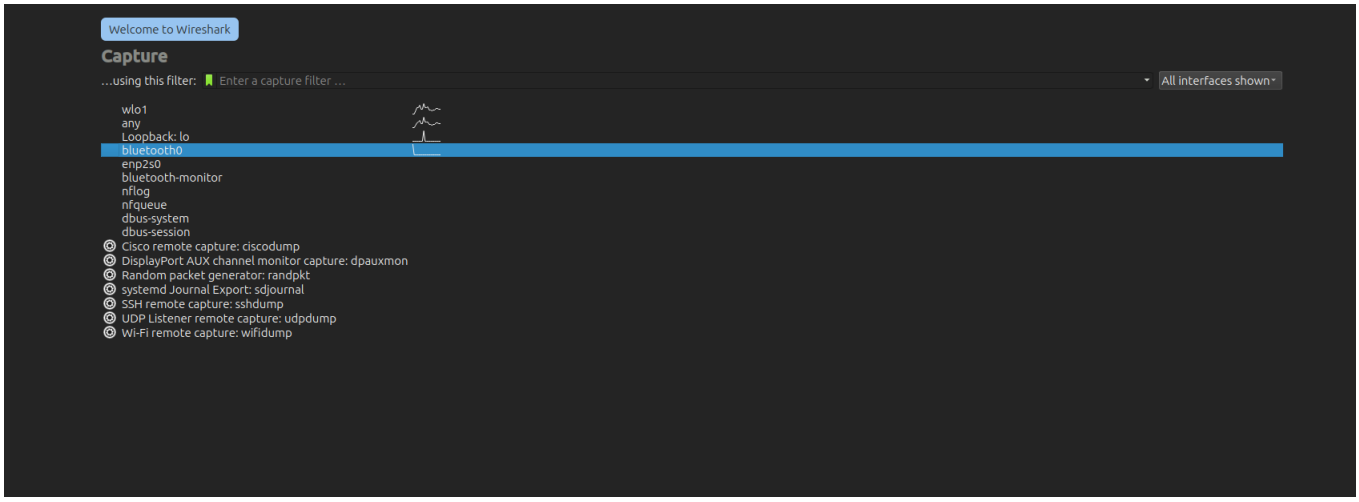
# PCS Assignment-9

Name:Aditya Rathor

Roll No: B22AI044

Installing and starting wireshark:

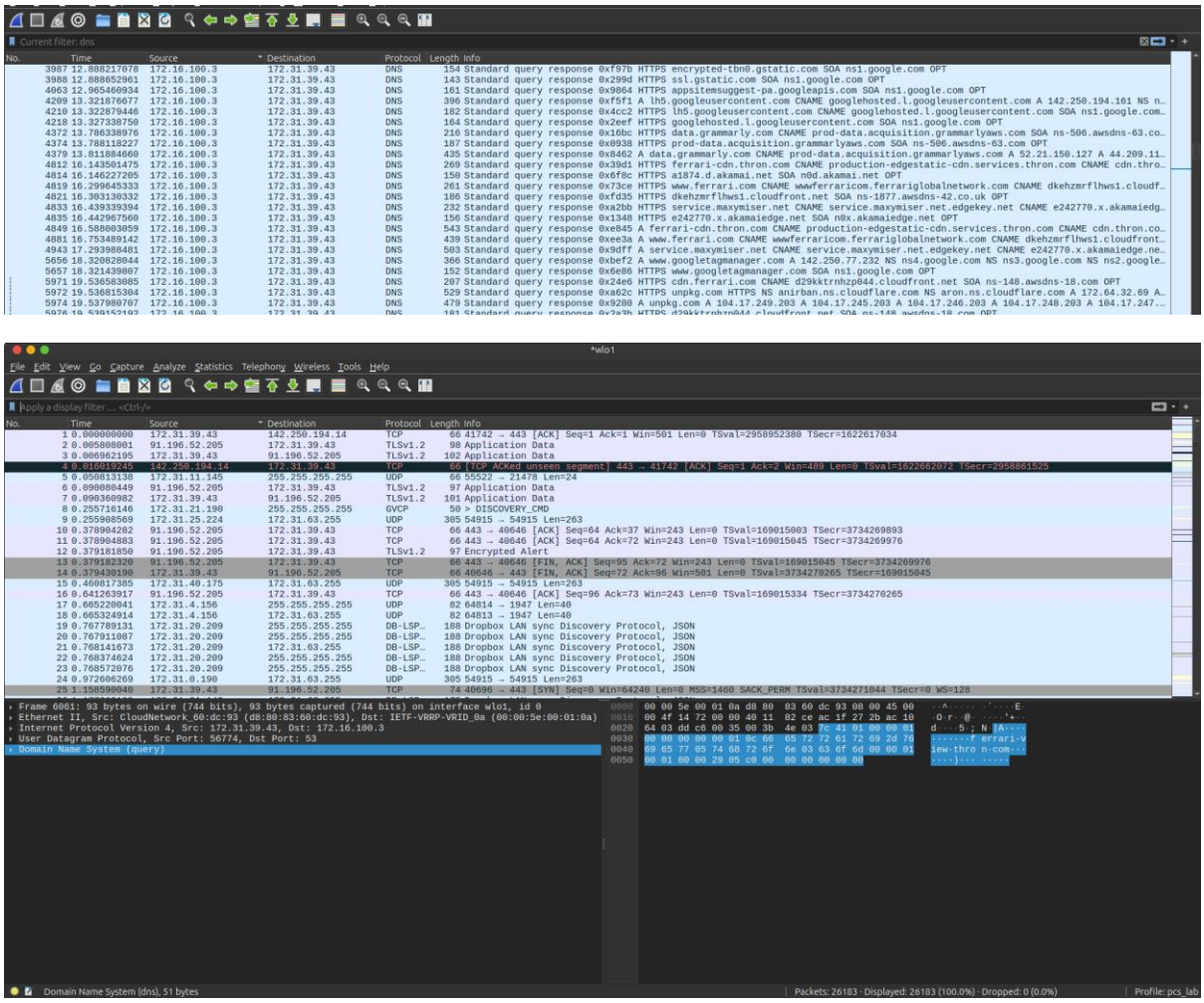
- Below is the display page where all possible capture interface are visible




Selection of Network Interface: In this based on my IP address (generated using ipconfig) that is given to me based on the wifi network I am connected to I was able to select that network interface

Start and Stop of Packet Capture: I initiated the packet capture process at the onset of the session to begin monitoring network traffic. Following the completion of the data collection phase, I terminated the packet capture to ensure the integrity and completeness of the captured network traffic dataset.

I searched for a website ferrai.com and was able to see being made to that website on wireshark



The below bar display that 26183 packets were transmitted with not even single dropped

Within a few seconds so many packets were captured because Wireshark usually operates in “promiscuous mode” (on local networks), meaning it sees all the traffic passing by, even when it doesn't involve your machine.

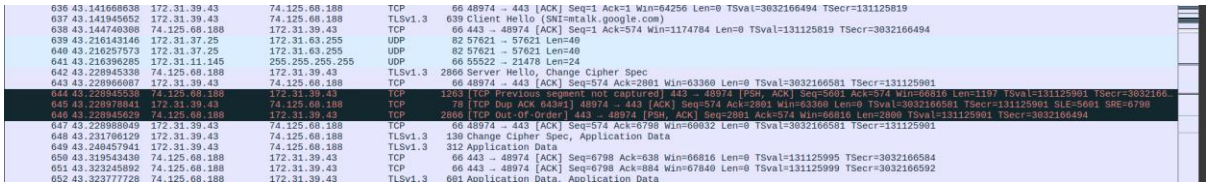
Identification Based on IP Address: Using Wireshark's filtering capabilities, I employed IP address-based filters to focus on specific traffic flows within the captured data. By filtering packets based on IP addresses, I targeted communication originating from or destined to specific hosts or devices on the network.

Some of which were:

dns: to search for packets that followed the dns protocol

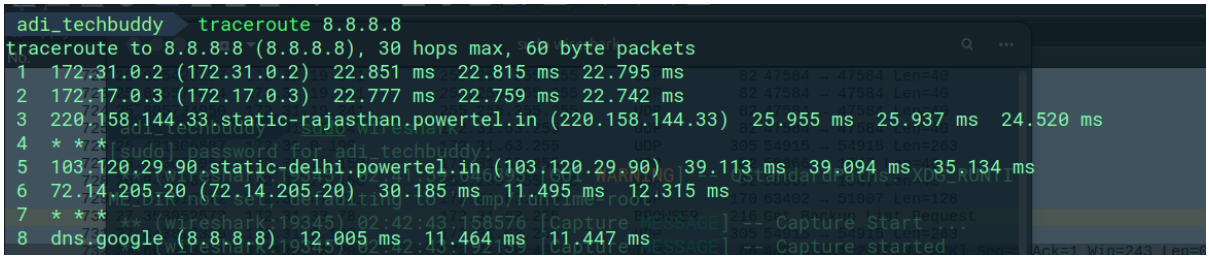
ip.src==<ip.addr> or ip.dest==<ip.addr> to see the packets of a particular ip address

Finding errors in packets as shown below:



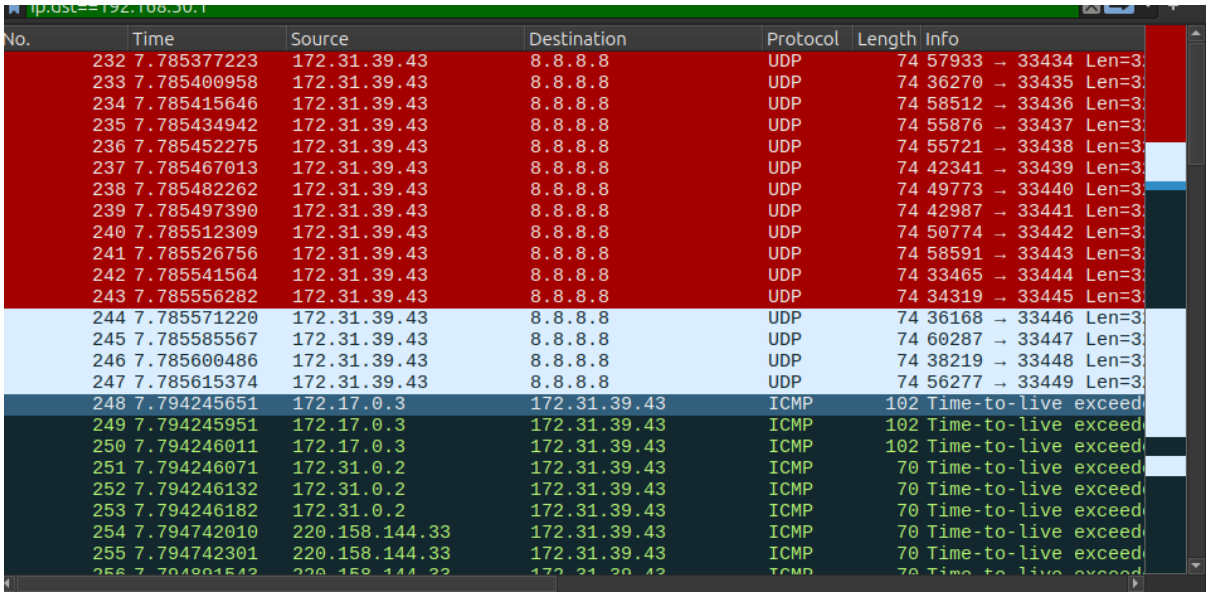

Out of order and duplicate packets were recieved which happens in TCP protocol

Traceroute to google's dns which is 8.8.8.8

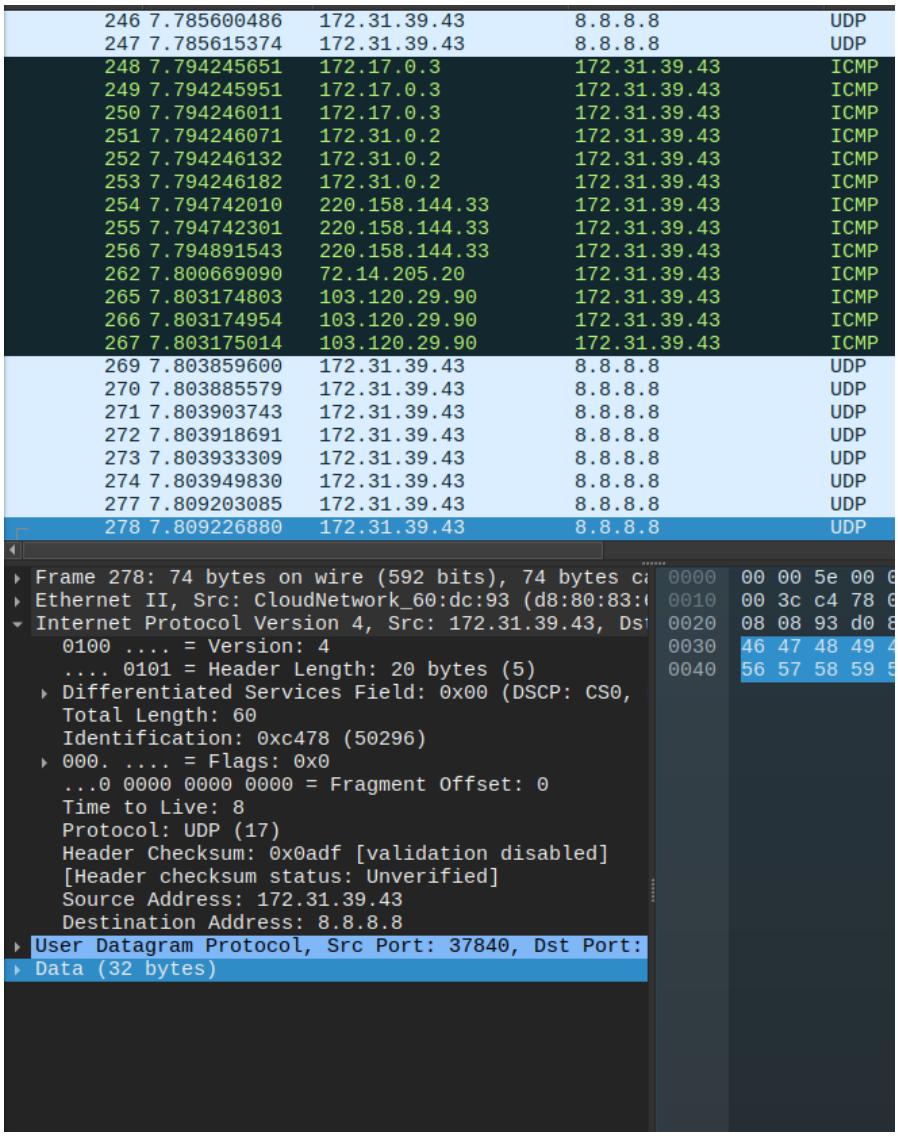



It displays the hop number, the ip address and domain names for each hop, and 3 round trip hop time.

And the output in wireshark which is request for going to destination port and below is the output following the udp protocol



| No. | Time | Source | Destination | Protocol | Length | Info |
|---|---|---|---|---|---|---|
| 232 | 7.785377223 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 57933 → 33434 Len=3 |
| 233 | 7.785400958 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 36270 → 33435 Len=3 |
| 234 | 7.785415646 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 58512 → 33436 Len=3 |
| 235 | 7.785434942 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 55876 → 33437 Len=3 |
| 236 | 7.785452275 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 55721 → 33438 Len=3 |
| 237 | 7.785467013 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 42341 → 33439 Len=3 |
| 238 | 7.785482262 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 49773 → 33440 Len=3 |
| 239 | 7.785497390 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 42987 → 33441 Len=3 |
| 240 | 7.785512309 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 50774 → 33442 Len=3 |
| 241 | 7.785526756 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 58591 → 33443 Len=3 |
| 242 | 7.785541564 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 33465 → 33444 Len=3 |
| 243 | 7.785556282 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 34319 → 33445 Len=3 |
| 244 | 7.785571220 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 36168 → 33446 Len=3 |
| 245 | 7.785585567 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 60287 → 33447 Len=3 |
| 246 | 7.785600486 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 38219 → 33448 Len=3 |
| 247 | 7.785615374 | 172.31.39.43 | 8.8.8.8 | UDP | 74 | 56277 → 33449 Len=3 |
| 248 | 7.794245651 | 172.17.0.3 | 172.31.39.43 | ICMP | 102 | Time-to-live exceed |
| 249 | 7.794245951 | 172.17.0.3 | 172.31.39.43 | ICMP | 102 | Time-to-live exceed |
| 250 | 7.794246011 | 172.17.0.3 | 172.31.39.43 | ICMP | 102 | Time-to-live exceed |
| 251 | 7.794246071 | 172.31.0.2 | 172.31.39.43 | ICMP | 70 | Time-to-live exceed |
| 252 | 7.794246132 | 172.31.0.2 | 172.31.39.43 | ICMP | 70 | Time-to-live exceed |
| 253 | 7.794246182 | 172.31.0.2 | 172.31.39.43 | ICMP | 70 | Time-to-live exceed |
| 254 | 7.794742010 | 220.158.144.33 | 172.31.39.43 | ICMP | 70 | Time-to-live exceed |
| 255 | 7.794742301 | 220.158.144.33 | 172.31.39.43 | ICMP | 70 | Time-to-live exceed |



| | | | | |
|---|---|---|---|---|
| 246 | 7.785600486 | 172.31.39.43 | 8.8.8.8 | UDP |
| 247 | 7.785615374 | 172.31.39.43 | 8.8.8.8 | UDP |
| 248 | 7.794245651 | 172.17.0.3 | 172.31.39.43 | ICMP |
| 249 | 7.794245951 | 172.17.0.3 | 172.31.39.43 | ICMP |
| 250 | 7.794246011 | 172.17.0.3 | 172.31.39.43 | ICMP |
| 251 | 7.794246071 | 172.31.0.2 | 172.31.39.43 | ICMP |
| 252 | 7.794246132 | 172.31.0.2 | 172.31.39.43 | ICMP |
| 253 | 7.794246182 | 172.31.0.2 | 172.31.39.43 | ICMP |
| 254 | 7.794742010 | 220.158.144.33 | 172.31.39.43 | ICMP |
| 255 | 7.794742301 | 220.158.144.33 | 172.31.39.43 | ICMP |
| 256 | 7.794891543 | 220.158.144.33 | 172.31.39.43 | ICMP |
| 262 | 7.800669090 | 72.14.205.20 | 172.31.39.43 | ICMP |
| 265 | 7.803174803 | 103.120.29.90 | 172.31.39.43 | ICMP |
| 266 | 7.803174954 | 103.120.29.90 | 172.31.39.43 | ICMP |
| 267 | 7.803175014 | 103.120.29.90 | 172.31.39.43 | ICMP |
| 269 | 7.803859600 | 172.31.39.43 | 8.8.8.8 | UDP |
| 270 | 7.803885579 | 172.31.39.43 | 8.8.8.8 | UDP |
| 271 | 7.803903743 | 172.31.39.43 | 8.8.8.8 | UDP |
| 272 | 7.803918691 | 172.31.39.43 | 8.8.8.8 | UDP |
| 273 | 7.803933309 | 172.31.39.43 | 8.8.8.8 | UDP |
| 274 | 7.803949830 | 172.31.39.43 | 8.8.8.8 | UDP |
| 277 | 7.809203085 | 172.31.39.43 | 8.8.8.8 | UDP |
| 278 | 7.809226880 | 172.31.39.43 | 8.8.8.8 | UDP |

```
▸ Frame 278: 74 bytes on wire (592 bits), 74 bytes ca
▸ Ethernet II, Src: CloudNetwork_60:dc:93 (d8:80:83:(
▾ Internet Protocol Version 4, Src: 172.31.39.43, Dst
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  ▸ Differentiated Services Field: 0x00 (DSCP: CS0,
    Total Length: 60
    Identification: 0xc478 (50296)
  ▸ 000. .... = Flags: 0x0
    ...0 0000 0000 0000 = Fragment Offset: 0
    Time to Live: 8
    Protocol: UDP (17)
    Header Checksum: 0x0adf [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 172.31.39.43
    Destination Address: 8.8.8.8
▸ User Datagram Protocol, Src Port: 37840, Dst Port:
▸ Data (32 bytes)
```

```
0000  00 00 5e 00 0
0010  00 3c c4 78 0
0020  08 08 93 d0 8
0030  46 47 48 49 4
0040  56 57 58 59 5
```

Packet starts with the ttl(time to live)= 1 which represent the maximum hop value before reaching it dies and starts again if not able to reach the destination port then it starts again by increasing the hop value and does the same

I am able to see that with time to live as 8 it is able to reach the destination port

Troubleshooting

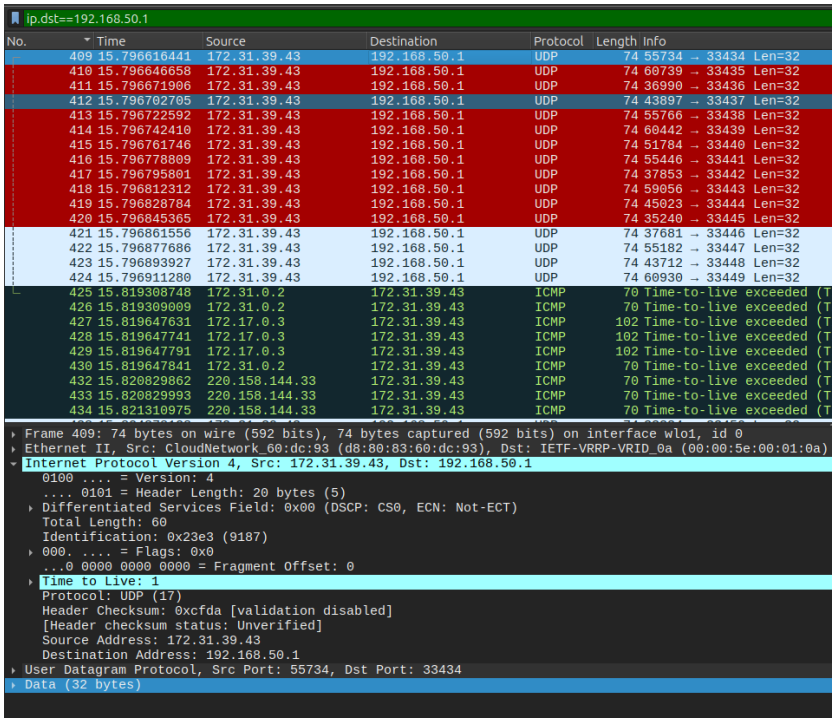
Now I pinged a random remote host

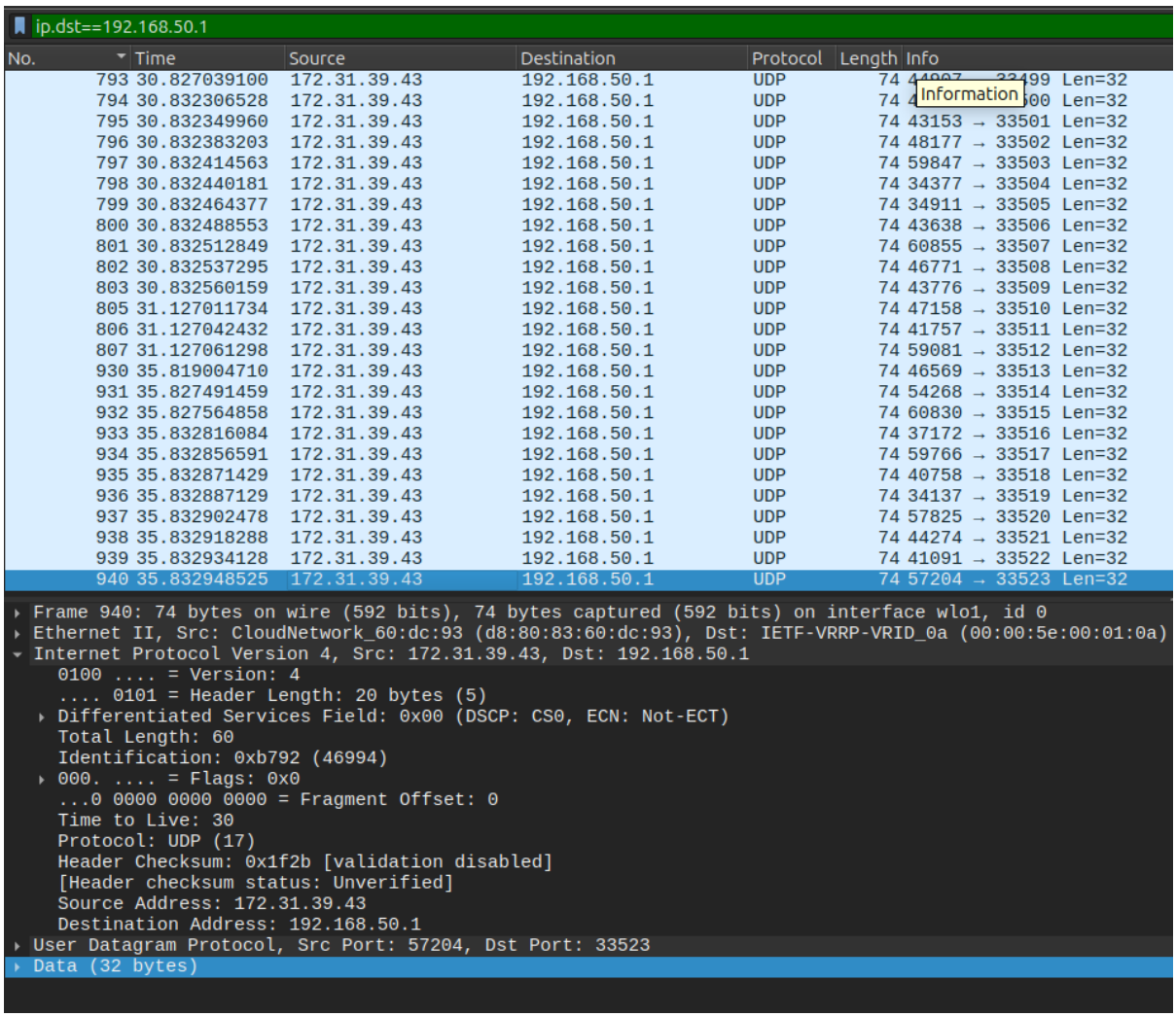
```
adi_techbuddy ▶ ping 192.168.50.1
PING 192.168.50.1 (192.168.50.1) 56(84) bytes of data.
^C
--- 192.168.50.1 ping statistics ---
5 packets transmitted, 0 received, 100% packet loss, time 4079ms
```

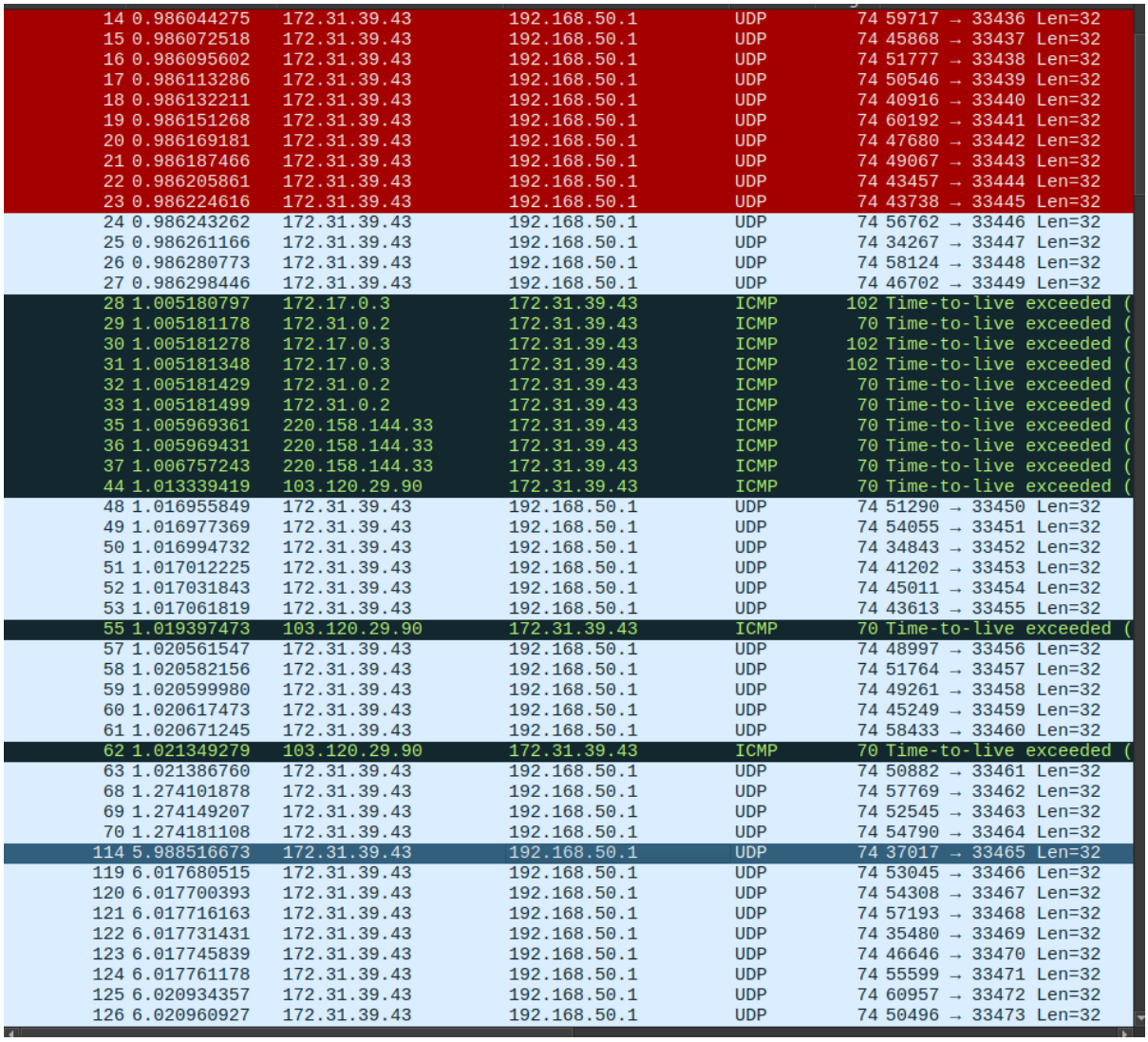
It was not able to send even single packet and then I traced its route

```
✘ adi_techbuddy ▶ traceroute 192.168.50.1
traceroute to 192.168.50.1 (192.168.50.1), 30 hops max, 60 byte packets
 1  172.31.0.2 (172.31.0.2)  22.701 ms  22.666 ms  22.981 ms
 2  172.17.0.3 (172.17.0.3)  22.946 ms  22.929 ms  22.907 ms
 3  220.158.144.33.static-rajasthan.powertel.in (220.158.144.33)  24.071 ms  24.534 ms  24.036 ms
 4  * * *
 5  103.120.29.90.static-delhi.powertel.in (103.120.29.90)  31.577 ms  31.561 ms  31.545 ms
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
```

Now I checked for the same in wireshark and was able to see the protocol which is UDP and as it is not able to reach it in max 30 hops it stops after ttl value reaching 30


ip.dst==192.168.50.1
No. Time Source Destination Protocol Length Info
409 15.796616441 172.31.39.43 192.168.50.1 UDP 74 55734 → 33434 Len=32
410 15.796646658 172.31.39.43 192.168.50.1 UDP 74 60739 → 33435 Len=32
411 15.796671906 172.31.39.43 192.168.50.1 UDP 74 36990 → 33436 Len=32
412 15.796702705 172.31.39.43 192.168.50.1 UDP 74 43897 → 33437 Len=32
413 15.796722592 172.31.39.43 192.168.50.1 UDP 74 55766 → 33438 Len=32
414 15.796742410 172.31.39.43 192.168.50.1 UDP 74 60442 → 33439 Len=32
415 15.796761746 172.31.39.43 192.168.50.1 UDP 74 51784 → 33440 Len=32
416 15.796778809 172.31.39.43 192.168.50.1 UDP 74 55446 → 33441 Len=32
417 15.796795801 172.31.39.43 192.168.50.1 UDP 74 37853 → 33442 Len=32
418 15.796812312 172.31.39.43 192.168.50.1 UDP 74 59056 → 33443 Len=32
419 15.796828784 172.31.39.43 192.168.50.1 UDP 74 45023 → 33444 Len=32
420 15.796845365 172.31.39.43 192.168.50.1 UDP 74 35240 → 33445 Len=32
421 15.796861556 172.31.39.43 192.168.50.1 UDP 74 37681 → 33446 Len=32
422 15.796877686 172.31.39.43 192.168.50.1 UDP 74 55182 → 33447 Len=32
423 15.796893927 172.31.39.43 192.168.50.1 UDP 74 43712 → 33448 Len=32
424 15.796911280 172.31.39.43 192.168.50.1 UDP 74 60930 → 33449 Len=32
425 15.819308748 172.31.0.2 172.31.39.43 ICMP 70 Time-to-live exceeded (T
426 15.819309009 172.31.0.2 172.31.39.43 ICMP 70 Time-to-live exceeded (T
427 15.819647631 172.17.0.3 172.31.39.43 ICMP 102 Time-to-live exceeded (T
428 15.819647741 172.17.0.3 172.31.39.43 ICMP 102 Time-to-live exceeded (T
429 15.819647791 172.17.0.3 172.31.39.43 ICMP 102 Time-to-live exceeded (T
430 15.819647841 172.31.0.2 172.31.39.43 ICMP 70 Time-to-live exceeded (T
432 15.820829862 220.158.144.33 172.31.39.43 ICMP 70 Time-to-live exceeded (T
433 15.820829993 220.158.144.33 172.31.39.43 ICMP 70 Time-to-live exceeded (T
434 15.821310975 220.158.144.33 172.31.39.43 ICMP 70 Time-to-live exceeded (T
Frame 409: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface wlo1, id 0
Ethernet II, Src: CloudNetwork_60:dc:93 (d8:80:83:60:dc:93), Dst: IETF-VRRP-VRID_0a (00:00:5e:00:01:0a)
Internet Protocol Version 4, Src: 172.31.39.43, Dst: 192.168.50.1
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 60
Identification: 0x23e3 (9187)
000. .... = Flags: 0x0
...0 0000 0000 0000 = Fragment Offset: 0
Time to Live: 1
Protocol: UDP (17)
Header Checksum: 0xcfda [validation disabled]
[Header checksum status: Unverified]
Source Address: 172.31.39.43
Destination Address: 192.168.50.1
User Datagram Protocol, Src Port: 55734, Dst Port: 33434
Data (32 bytes)


ip.dst==192.168.50.1
No. Time Source Destination Protocol Length Info
793 30.827039100 172.31.39.43 192.168.50.1 UDP 74 Information 33499 Len=32
794 30.832306528 172.31.39.43 192.168.50.1 UDP 74 [illegible]00 Len=32
795 30.832349960 172.31.39.43 192.168.50.1 UDP 74 43153 → 33501 Len=32
796 30.832383203 172.31.39.43 192.168.50.1 UDP 74 48177 → 33502 Len=32
797 30.832414563 172.31.39.43 192.168.50.1 UDP 74 59847 → 33503 Len=32
798 30.832440181 172.31.39.43 192.168.50.1 UDP 74 34377 → 33504 Len=32
799 30.832464377 172.31.39.43 192.168.50.1 UDP 74 34911 → 33505 Len=32
800 30.832488553 172.31.39.43 192.168.50.1 UDP 74 43638 → 33506 Len=32
801 30.832512849 172.31.39.43 192.168.50.1 UDP 74 60855 → 33507 Len=32
802 30.832537295 172.31.39.43 192.168.50.1 UDP 74 46771 → 33508 Len=32
803 30.832560159 172.31.39.43 192.168.50.1 UDP 74 43776 → 33509 Len=32
805 31.127011734 172.31.39.43 192.168.50.1 UDP 74 47158 → 33510 Len=32
806 31.127042432 172.31.39.43 192.168.50.1 UDP 74 41757 → 33511 Len=32
807 31.127061298 172.31.39.43 192.168.50.1 UDP 74 59081 → 33512 Len=32
930 35.819004710 172.31.39.43 192.168.50.1 UDP 74 46569 → 33513 Len=32
931 35.827491459 172.31.39.43 192.168.50.1 UDP 74 54268 → 33514 Len=32
932 35.827564858 172.31.39.43 192.168.50.1 UDP 74 60830 → 33515 Len=32
933 35.832816084 172.31.39.43 192.168.50.1 UDP 74 37172 → 33516 Len=32
934 35.832856591 172.31.39.43 192.168.50.1 UDP 74 59766 → 33517 Len=32
935 35.832871429 172.31.39.43 192.168.50.1 UDP 74 40758 → 33518 Len=32
936 35.832887129 172.31.39.43 192.168.50.1 UDP 74 34137 → 33519 Len=32
937 35.832902478 172.31.39.43 192.168.50.1 UDP 74 57825 → 33520 Len=32
938 35.832918288 172.31.39.43 192.168.50.1 UDP 74 44274 → 33521 Len=32
939 35.832934128 172.31.39.43 192.168.50.1 UDP 74 41091 → 33522 Len=32
940 35.832948525 172.31.39.43 192.168.50.1 UDP 74 57204 → 33523 Len=32
Frame 940: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface wlo1, id 0
Ethernet II, Src: CloudNetwork_60:dc:93 (d8:80:83:60:dc:93), Dst: IETF-VRRP-VRID_0a (00:00:5e:00:01:0a)
Internet Protocol Version 4, Src: 172.31.39.43, Dst: 192.168.50.1
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 60
Identification: 0xb792 (46994)
000. .... = Flags: 0x0
...0 0000 0000 0000 = Fragment Offset: 0
Time to Live: 30
Protocol: UDP (17)
Header Checksum: 0x1f2b [validation disabled]
[Header checksum status: Unverified]
Source Address: 172.31.39.43
Destination Address: 192.168.50.1
User Datagram Protocol, Src Port: 57204, Dst Port: 33523
Data (32 bytes)



| | | | | | |
|---|---|---|---|---|---|
| 14 | 0.986044275 | 172.31.39.43 | 192.168.50.1 | UDP | 74 59717 → 33436 Len=32 |
| 15 | 0.986072518 | 172.31.39.43 | 192.168.50.1 | UDP | 74 45868 → 33437 Len=32 |
| 16 | 0.986095602 | 172.31.39.43 | 192.168.50.1 | UDP | 74 51777 → 33438 Len=32 |
| 17 | 0.986113286 | 172.31.39.43 | 192.168.50.1 | UDP | 74 50546 → 33439 Len=32 |
| 18 | 0.986132211 | 172.31.39.43 | 192.168.50.1 | UDP | 74 40916 → 33440 Len=32 |
| 19 | 0.986151268 | 172.31.39.43 | 192.168.50.1 | UDP | 74 60192 → 33441 Len=32 |
| 20 | 0.986169181 | 172.31.39.43 | 192.168.50.1 | UDP | 74 47680 → 33442 Len=32 |
| 21 | 0.986187466 | 172.31.39.43 | 192.168.50.1 | UDP | 74 49067 → 33443 Len=32 |
| 22 | 0.986205861 | 172.31.39.43 | 192.168.50.1 | UDP | 74 43457 → 33444 Len=32 |
| 23 | 0.986224616 | 172.31.39.43 | 192.168.50.1 | UDP | 74 43738 → 33445 Len=32 |
| 24 | 0.986243262 | 172.31.39.43 | 192.168.50.1 | UDP | 74 56762 → 33446 Len=32 |
| 25 | 0.986261166 | 172.31.39.43 | 192.168.50.1 | UDP | 74 34267 → 33447 Len=32 |
| 26 | 0.986280773 | 172.31.39.43 | 192.168.50.1 | UDP | 74 58124 → 33448 Len=32 |
| 27 | 0.986298446 | 172.31.39.43 | 192.168.50.1 | UDP | 74 46702 → 33449 Len=32 |
| 28 | 1.005180797 | 172.17.0.3 | 172.31.39.43 | ICMP | 102 Time-to-live exceeded ( |
| 29 | 1.005181178 | 172.31.0.2 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 30 | 1.005181278 | 172.17.0.3 | 172.31.39.43 | ICMP | 102 Time-to-live exceeded ( |
| 31 | 1.005181348 | 172.17.0.3 | 172.31.39.43 | ICMP | 102 Time-to-live exceeded ( |
| 32 | 1.005181429 | 172.31.0.2 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 33 | 1.005181499 | 172.31.0.2 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 35 | 1.005969361 | 220.158.144.33 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 36 | 1.005969431 | 220.158.144.33 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 37 | 1.006757243 | 220.158.144.33 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 44 | 1.013339419 | 103.120.29.90 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 48 | 1.016955849 | 172.31.39.43 | 192.168.50.1 | UDP | 74 51290 → 33450 Len=32 |
| 49 | 1.016977369 | 172.31.39.43 | 192.168.50.1 | UDP | 74 54055 → 33451 Len=32 |
| 50 | 1.016994732 | 172.31.39.43 | 192.168.50.1 | UDP | 74 34843 → 33452 Len=32 |
| 51 | 1.017012225 | 172.31.39.43 | 192.168.50.1 | UDP | 74 41202 → 33453 Len=32 |
| 52 | 1.017031843 | 172.31.39.43 | 192.168.50.1 | UDP | 74 45011 → 33454 Len=32 |
| 53 | 1.017061819 | 172.31.39.43 | 192.168.50.1 | UDP | 74 43613 → 33455 Len=32 |
| 55 | 1.019397473 | 103.120.29.90 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 57 | 1.020561547 | 172.31.39.43 | 192.168.50.1 | UDP | 74 48997 → 33456 Len=32 |
| 58 | 1.020582156 | 172.31.39.43 | 192.168.50.1 | UDP | 74 51764 → 33457 Len=32 |
| 59 | 1.020599980 | 172.31.39.43 | 192.168.50.1 | UDP | 74 49261 → 33458 Len=32 |
| 60 | 1.020617473 | 172.31.39.43 | 192.168.50.1 | UDP | 74 45249 → 33459 Len=32 |
| 61 | 1.020671245 | 172.31.39.43 | 192.168.50.1 | UDP | 74 58433 → 33460 Len=32 |
| 62 | 1.021349279 | 103.120.29.90 | 172.31.39.43 | ICMP | 70 Time-to-live exceeded ( |
| 63 | 1.021386760 | 172.31.39.43 | 192.168.50.1 | UDP | 74 50882 → 33461 Len=32 |
| 68 | 1.274101878 | 172.31.39.43 | 192.168.50.1 | UDP | 74 57769 → 33462 Len=32 |
| 69 | 1.274149207 | 172.31.39.43 | 192.168.50.1 | UDP | 74 52545 → 33463 Len=32 |
| 70 | 1.274181108 | 172.31.39.43 | 192.168.50.1 | UDP | 74 54790 → 33464 Len=32 |
| 114 | 5.988516673 | 172.31.39.43 | 192.168.50.1 | UDP | 74 37017 → 33465 Len=32 |
| 119 | 6.017680515 | 172.31.39.43 | 192.168.50.1 | UDP | 74 53045 → 33466 Len=32 |
| 120 | 6.017700393 | 172.31.39.43 | 192.168.50.1 | UDP | 74 54308 → 33467 Len=32 |
| 121 | 6.017716163 | 172.31.39.43 | 192.168.50.1 | UDP | 74 57193 → 33468 Len=32 |
| 122 | 6.017731431 | 172.31.39.43 | 192.168.50.1 | UDP | 74 35480 → 33469 Len=32 |
| 123 | 6.017745839 | 172.31.39.43 | 192.168.50.1 | UDP | 74 46646 → 33470 Len=32 |
| 124 | 6.017761178 | 172.31.39.43 | 192.168.50.1 | UDP | 74 55599 → 33471 Len=32 |
| 125 | 6.020934357 | 172.31.39.43 | 192.168.50.1 | UDP | 74 60957 → 33472 Len=32 |
| 126 | 6.020960927 | 172.31.39.43 | 192.168.50.1 | UDP | 74 50496 → 33473 Len=32 |

Thus wireshark helps in troubleshooting at which port it is giving error and not able to move forward and from above it is port 103.120.39.90 after which no icmp protocol is followed to our src port

ICMP stands for Internet Control Message Protocol. It's a network layer protocol in the Internet Protocol (IP) suite, primarily used for diagnostic and control purposes. ICMP is used by network devices, such as routers and hosts, to communicate error messages, status updates, and other control information to one another.

Packet Inspection: Wireshark allows for the capture and analysis of network packets in real-time or from stored capture files. By inspecting packet payloads, headers, and metadata, security analysts can identify anomalies or patterns indicative of security threats.

Protocol Analysis: Wireshark supports the decoding and analysis of various network protocols, including TCP, UDP, ICMP, DNS, HTTP, and more. Analyzing protocol interactions can reveal abnormalities or unauthorized behaviors that may indicate security breaches or malicious activities.

Signature Detection: Wireshark can be used to apply signature-based detection techniques to identify known patterns associated with malware infections, suspicious activities, or common attack vectors. This involves comparing captured packets against predefined signatures or rulesets to flag potential threats.

Behavioral Analysis: Wireshark enables security analysts to conduct behavioral analysis by monitoring network traffic over time and identifying deviations from normal patterns. Sudden spikes in traffic, unusual communication patterns, or unexpected protocol usage may indicate security incidents or unauthorized access attempts.

Anomaly Detection: Wireshark supports anomaly detection techniques to identify irregularities in network traffic that may signify security threats. This includes detecting unusual packet sizes, high rates of packet loss, unexpected port usage, or abnormal communication flows.

DNS Resolution: Wireshark can capture and analyze DNS traffic, allowing analysts to detect DNS-based attacks such as DNS spoofing, DNS hijacking, or domain generation algorithms (DGAs) used by malware for command and control.

Encryption Inspection: While Wireshark cannot decrypt encrypted traffic without access to encryption keys, it can still analyze encrypted protocols and metadata. Analysts can look for signs of encrypted communication that may be indicative of data exfiltration or unauthorized access.

Traffic Profiling: Wireshark facilitates traffic profiling by categorizing network traffic based on protocols, source/destination IP addresses, port numbers, and other attributes. This helps identify abnormal traffic patterns or unexpected network behaviors that may indicate security threats.

Forensic Analysis: Wireshark can be used for forensic analysis of network traffic to reconstruct events, trace the origins of security incidents, and gather evidence for incident response or legal purposes.

Actions that I will take to tackle malware threats:

Analyze captured packets in Wireshark to identify patterns associated with known malware infections or suspicious activities.

Implement firewall rules or intrusion prevention systems (IPS) to block traffic originating from malicious IP addresses or exhibiting malicious behavior.

Analyze network traffic in Wireshark to identify plaintext transmission of sensitive data, such as login credentials or confidential information.

Implement encryption protocols (e.g., TLS/SSL) to encrypt sensitive data in transit and protect against eavesdropping or data interception.