MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

DEPARTMENT OF ICT

Lab Report No : 02

Course Code : ICT-3208

Course Title : Network Planning and Designing Lab

Lab Report Name : Wireshark Lab

Submitted by	***Submitted to***
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Objective : 1. Wireshark basic and it's features.
2.How to work with wireshark?
3. Protocol Analysis with wireshark

1. What is Wireshark? Why we use wireshark ?

Ans: Wireshark :

- Wireshark is a network protocol analyzer.
  - Captures network packets
  - displays packet data in details
- First released in 1998 by Geralds Combs as Ethereal - many contributors around the world.
- Open source and free software.
- Graphical alternative to tcpdump.

Why use wireshark : We use wireshark because -
Wireshark is a powerful tool for -
i. Troubleshooting network problems
ii. examining security problems
iii. debugging protocol implementations iv.
learning network protocols internals.

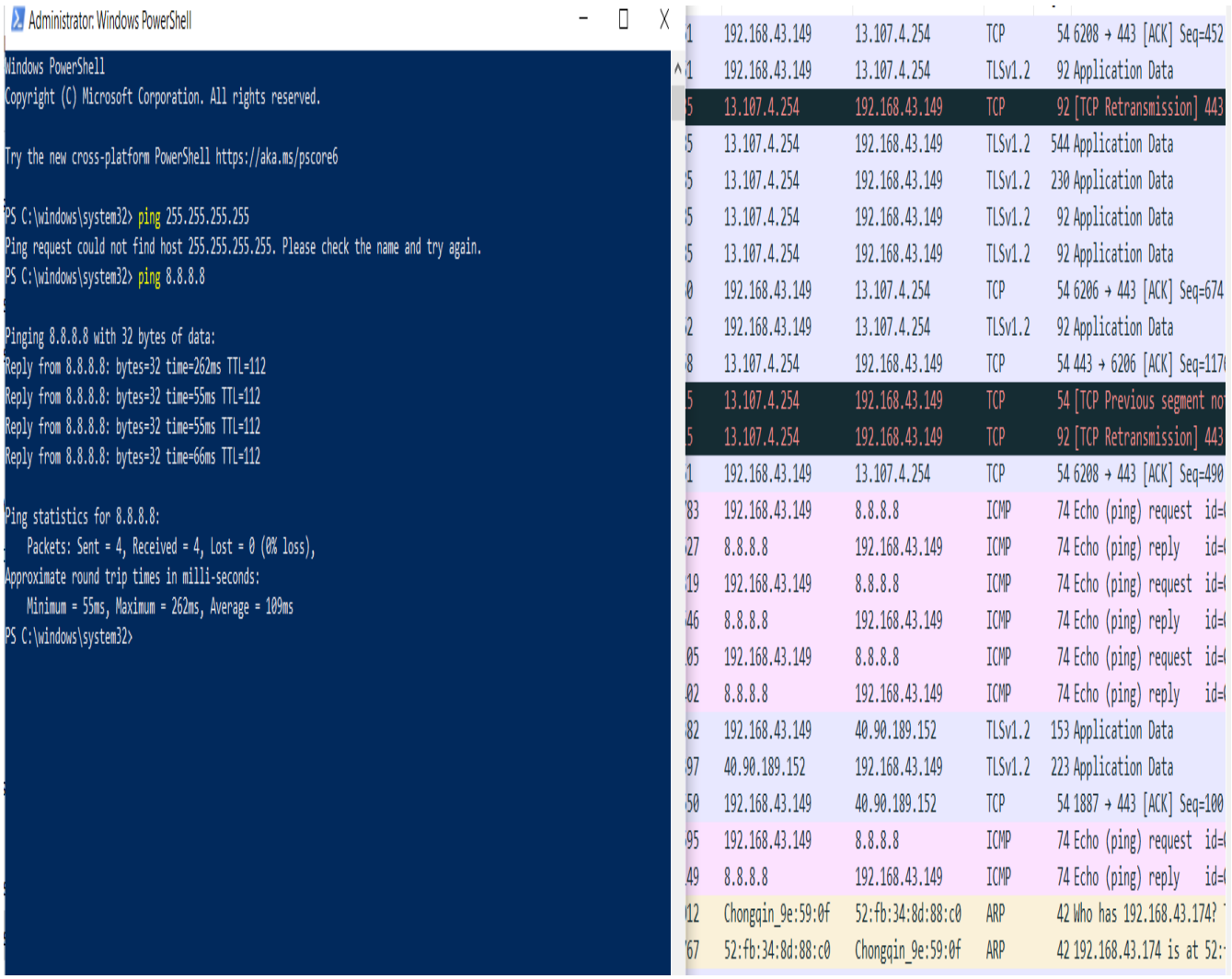
2. What are the main features of wireshark ?

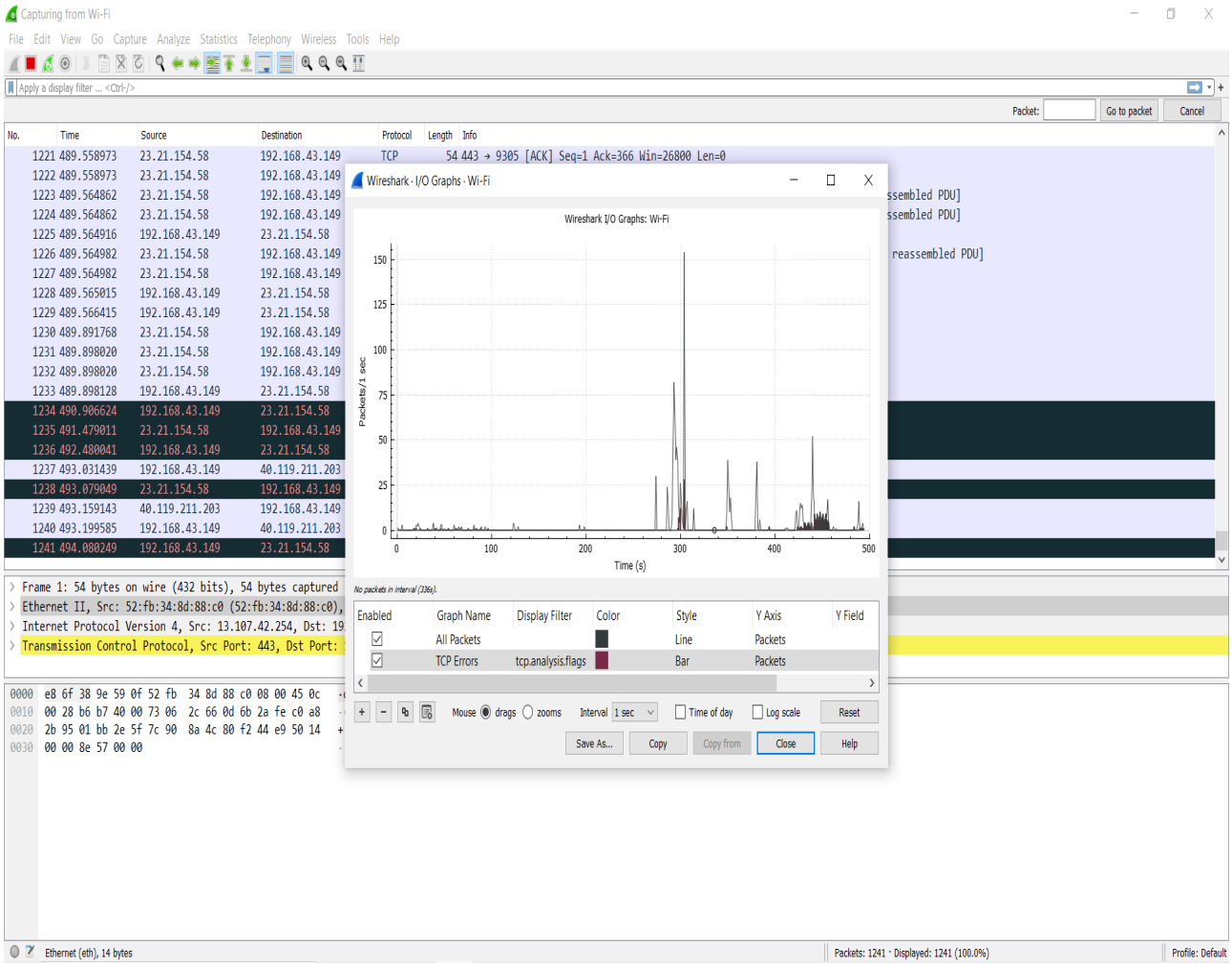
Ans : The main features of wireshark is :

i. Capture live traffic
-data can be captured on wired or wireless medium.
-numerous protocols can be captured and analyzed.

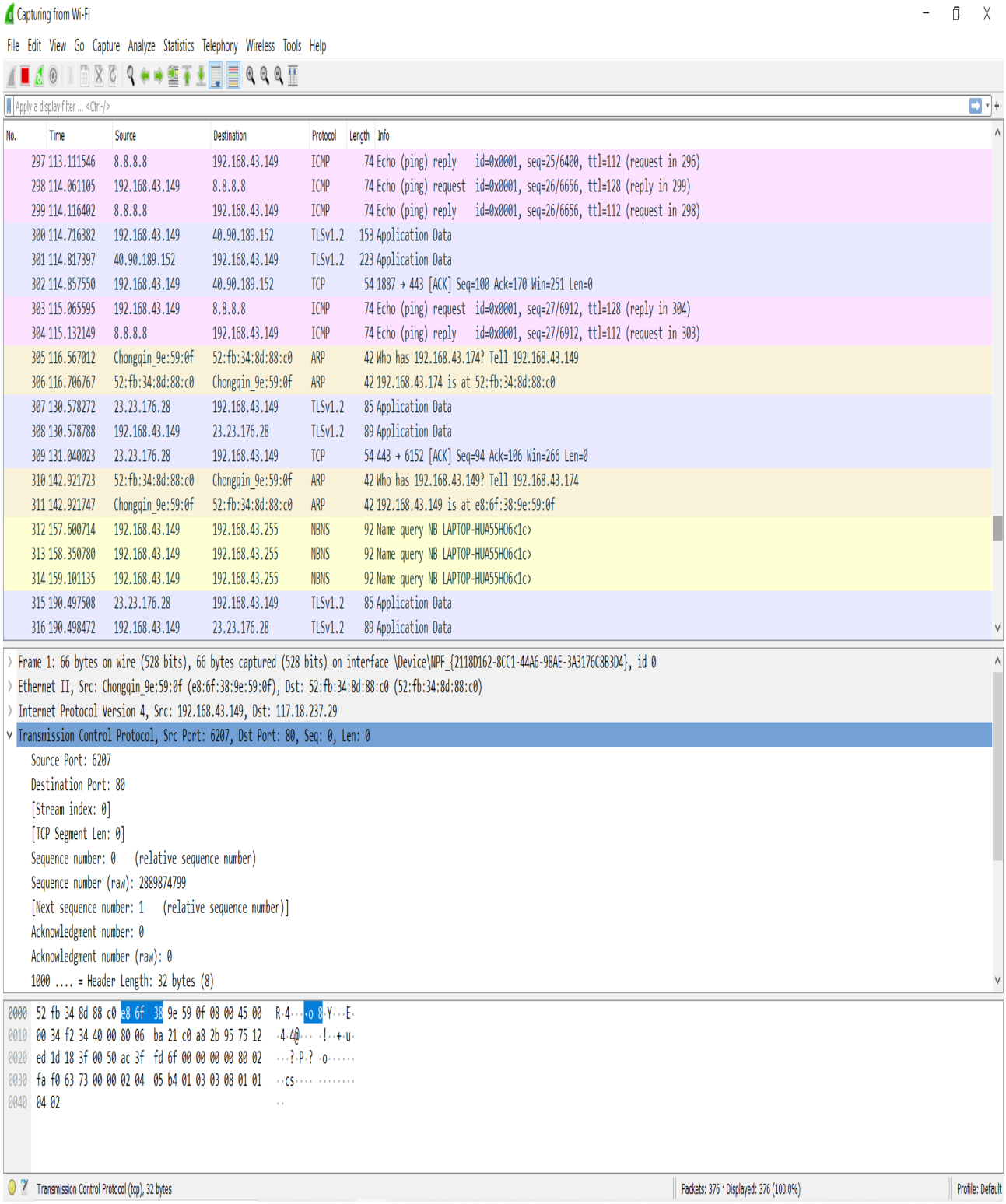
ii. Display packet in details iii. Open files containing packet data captured. -from other programs(tcpdump/winDump). iv. Filtering is essential when dealing with lots of packets.
-filters can be applied on protocols,fields,values etc. -filtering while capturing packets is possible.

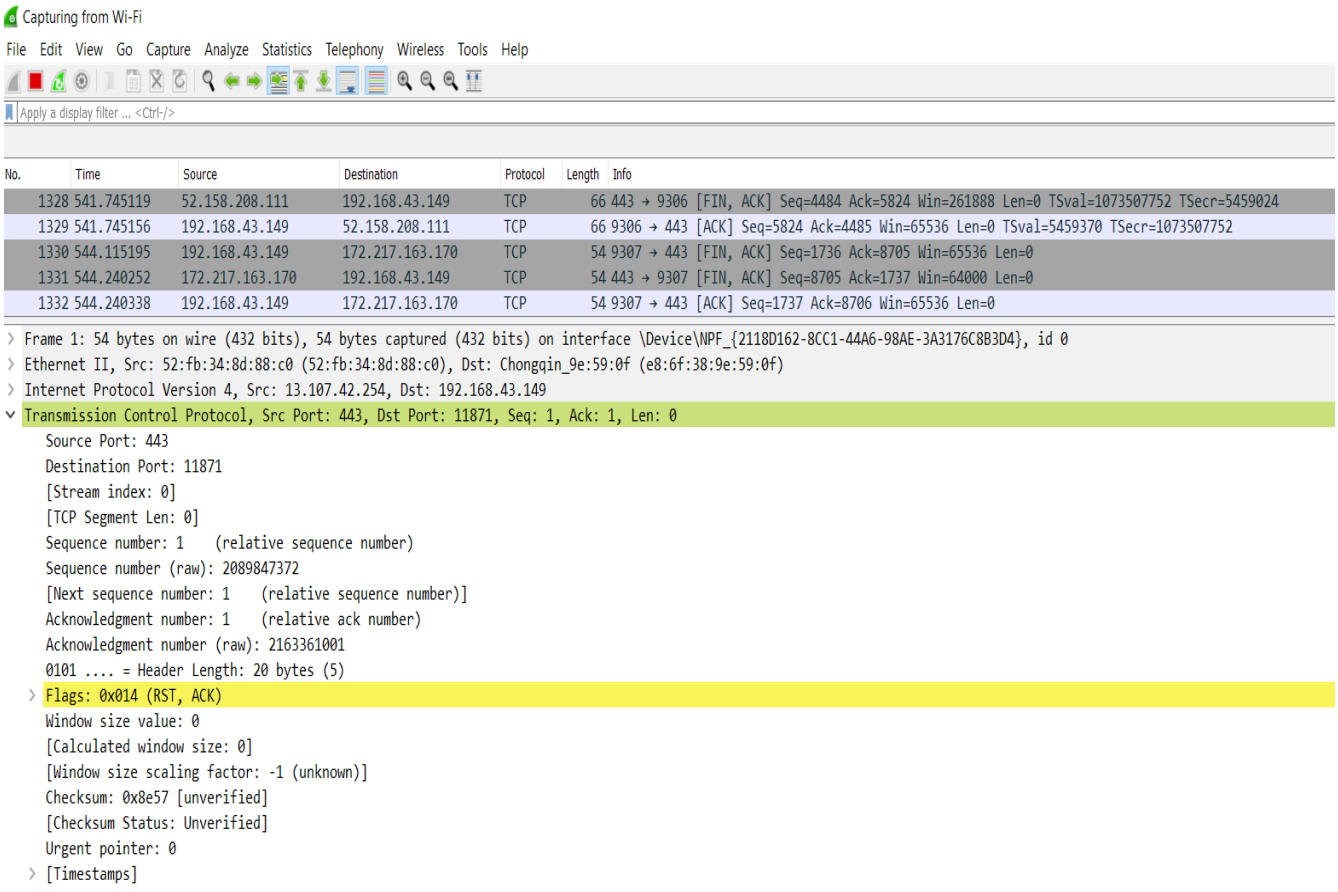
3. Ping information & captured packet: ping 8.8.8.8 in powershell


Administrator: Windows PowerShell
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Try the new cross-platform PowerShell https://aka.ms/pscore6
PS C:\windows\system32> ping 255.255.255.255
Ping request could not find host 255.255.255.255. Please check the name and try again.
PS C:\windows\system32> ping 8.8.8.8
Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=262ms TTL=112
Reply from 8.8.8.8: bytes=32 time=55ms TTL=112
Reply from 8.8.8.8: bytes=32 time=55ms TTL=112
Reply from 8.8.8.8: bytes=32 time=66ms TTL=112
Ping statistics for 8.8.8.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 55ms, Maximum = 262ms, Average = 109ms
PS C:\windows\system32>
192.168.43.149 13.107.4.254 TCP 54 6208 → 443 [ACK] Seq=452
192.168.43.149 13.107.4.254 TLSv1.2 92 Application Data
13.107.4.254 192.168.43.149 TCP 92 [TCP Retransmission] 443
13.107.4.254 192.168.43.149 TLSv1.2 544 Application Data
13.107.4.254 192.168.43.149 TLSv1.2 230 Application Data
13.107.4.254 192.168.43.149 TLSv1.2 92 Application Data
13.107.4.254 192.168.43.149 TLSv1.2 92 Application Data
192.168.43.149 13.107.4.254 TCP 54 6206 → 443 [ACK] Seq=674
192.168.43.149 13.107.4.254 TLSv1.2 92 Application Data
13.107.4.254 192.168.43.149 TCP 54 443 → 6206 [ACK] Seq=117
13.107.4.254 192.168.43.149 TCP 54 [TCP Previous segment not
13.107.4.254 192.168.43.149 TCP 92 [TCP Retransmission] 443
192.168.43.149 13.107.4.254 TCP 54 6208 → 443 [ACK] Seq=490
192.168.43.149 8.8.8.8 ICMP 74 Echo (ping) request id=
8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=
192.168.43.149 8.8.8.8 ICMP 74 Echo (ping) request id=
8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=
192.168.43.149 8.8.8.8 ICMP 74 Echo (ping) request id=
8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=
192.168.43.149 40.90.189.152 TLSv1.2 153 Application Data
40.90.189.152 192.168.43.149 TLSv1.2 223 Application Data
192.168.43.149 40.90.189.152 TCP 54 1887 → 443 [ACK] Seq=100
192.168.43.149 8.8.8.8 ICMP 74 Echo (ping) request id=
8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=
Chongqin_9e:59:0f 52:fb:34:8d:88:c0 ARP 42 Who has 192.168.43.174?
52:fb:34:8d:88:c0 Chongqin_9e:59:0f ARP 42 192.168.43.174 is at 52:

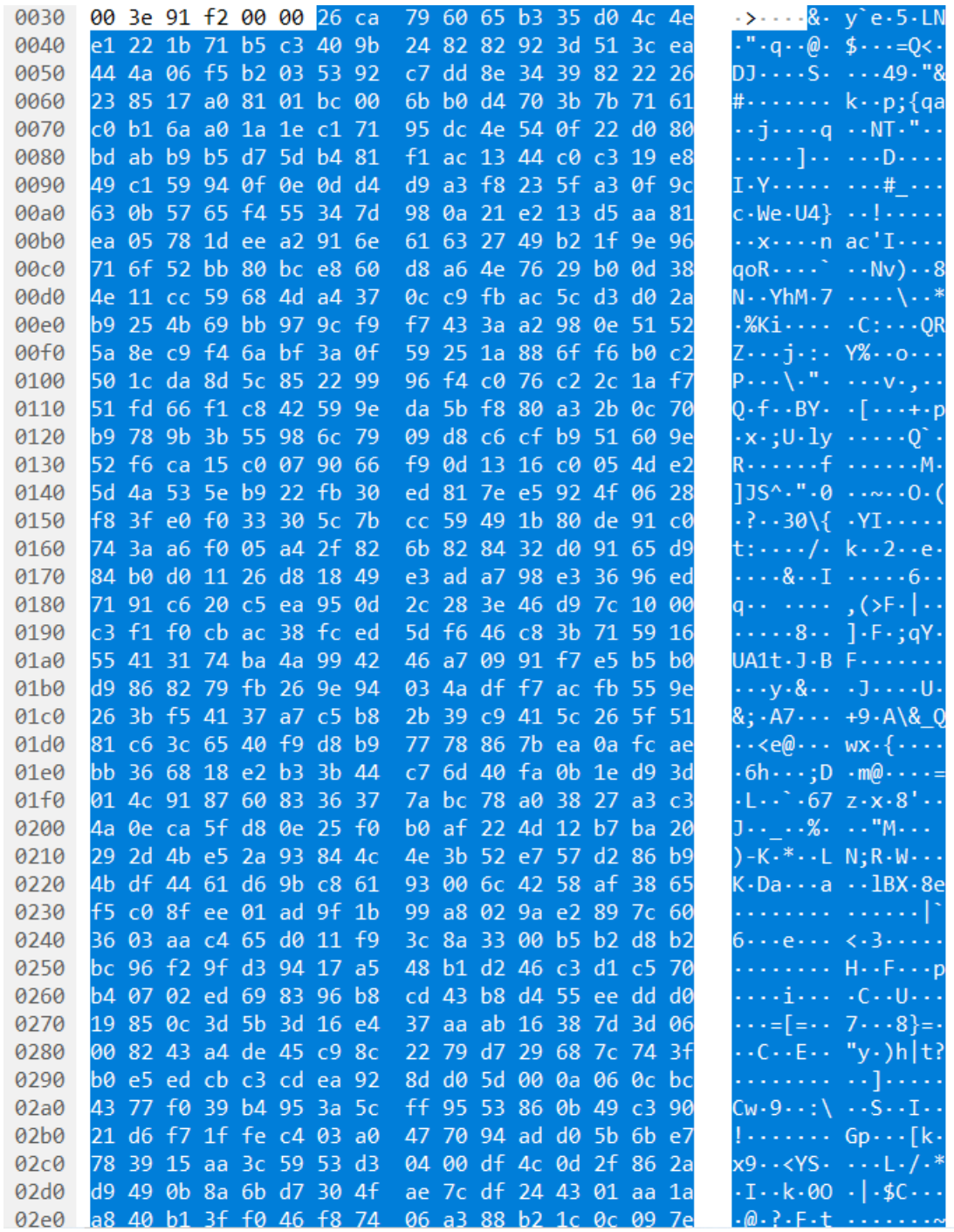


4. The protocol information :


Capturing from Wi-Fi
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
297 113.111546 8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=0x0001, seq=25/6400, ttl=112 (request in 296)
298 114.061105 192.168.43.149 8.8.8.8 ICMP 74 Echo (ping) request id=0x0001, seq=26/6656, ttl=128 (reply in 299)
299 114.116402 8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=0x0001, seq=26/6656, ttl=112 (request in 298)
300 114.716382 192.168.43.149 40.90.189.152 TLSv1.2 153 Application Data
301 114.817397 40.90.189.152 192.168.43.149 TLSv1.2 223 Application Data
302 114.857550 192.168.43.149 40.90.189.152 TCP 54 1887 → 443 [ACK] Seq=100 Ack=170 Win=251 Len=0
303 115.065595 192.168.43.149 8.8.8.8 ICMP 74 Echo (ping) request id=0x0001, seq=27/6912, ttl=128 (reply in 304)
304 115.132149 8.8.8.8 192.168.43.149 ICMP 74 Echo (ping) reply id=0x0001, seq=27/6912, ttl=112 (request in 303)
305 116.567012 Chongqin_9e:59:0f 52:fb:34:8d:88:c0 ARP 42 Who has 192.168.43.174? Tell 192.168.43.149
306 116.706767 52:fb:34:8d:88:c0 Chongqin_9e:59:0f ARP 42 192.168.43.174 is at 52:fb:34:8d:88:c0
307 130.578272 23.23.176.28 192.168.43.149 TLSv1.2 85 Application Data
308 130.578788 192.168.43.149 23.23.176.28 TLSv1.2 89 Application Data
309 131.040023 23.23.176.28 192.168.43.149 TCP 54 443 → 6152 [ACK] Seq=94 Ack=106 Win=266 Len=0
310 142.921723 52:fb:34:8d:88:c0 Chongqin_9e:59:0f ARP 42 Who has 192.168.43.149? Tell 192.168.43.174
311 142.921747 Chongqin_9e:59:0f 52:fb:34:8d:88:c0 ARP 42 192.168.43.149 is at e8:6f:38:9e:59:0f
312 157.600714 192.168.43.149 192.168.43.255 NBNS 92 Name query NB LAPTOP-HUA55HO6<1c>
313 158.350780 192.168.43.149 192.168.43.255 NBNS 92 Name query NB LAPTOP-HUA55HO6<1c>
314 159.101135 192.168.43.149 192.168.43.255 NBNS 92 Name query NB LAPTOP-HUA55HO6<1c>
315 190.497508 23.23.176.28 192.168.43.149 TLSv1.2 85 Application Data
316 190.498472 192.168.43.149 23.23.176.28 TLSv1.2 89 Application Data
Frame 1: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface \Device\NPF_{2118D162-8CC1-44A6-98AE-3A3176C8B3D4}, id 0
Ethernet II, Src: Chongqin_9e:59:0f (e8:6f:38:9e:59:0f), Dst: 52:fb:34:8d:88:c0 (52:fb:34:8d:88:c0)
Internet Protocol Version 4, Src: 192.168.43.149, Dst: 117.18.237.29
Transmission Control Protocol, Src Port: 6207, Dst Port: 80, Seq: 0, Len: 0
Source Port: 6207
Destination Port: 80
[Stream index: 0]
[TCP Segment Len: 0]
Sequence number: 0 (relative sequence number)
Sequence number (raw): 2889874799
[Next sequence number: 1 (relative sequence number)]
Acknowledgment number: 0
Acknowledgment number (raw): 0
1000 .... = Header Length: 32 bytes (8)
0000 52 fb 34 8d 88 c0 e8 6f 38 9e 59 0f 08 00 45 00
0010 00 34 f2 34 40 00 80 06 ba 21 c0 a8 2b 95 75 12
0020 ed 1d 18 3f 00 50 ac 3f fd 6f 00 00 00 00 80 02
0030 fa f0 63 73 00 00 02 04 05 b4 01 03 03 08 01 01
0040 04 02
Transmission Control Protocol (tcp), 32 bytes
Packets: 376 · Displayed: 376 (100.0%)
Profile: Default



5. Port Security Hashing Algorithm:



```
0030  00 3e 91 f2 00 00 26 ca  79 60 65 b3 35 d0 4c 4e   ·>····&· y`e·5·LN
0040  e1 22 1b 71 b5 c3 40 9b  24 82 82 92 3d 51 3c ea   ·"·q··@· $···=Q<·
0050  44 4a 06 f5 b2 03 53 92  c7 dd 8e 34 39 82 22 26   DJ····S· ···49·"&
0060  23 85 17 a0 81 01 bc 00  6b b0 d4 70 3b 7b 71 61   #····· k··p;{qa
0070  c0 b1 6a a0 1a 1e c1 71  95 dc 4e 54 0f 22 d0 80   ··j····q ··NT·"··
0080  bd ab b9 b5 d7 5d b4 81  f1 ac 13 44 c0 c3 19 e8   ·····]·· ···D····
0090  49 c1 59 94 0f 0e 0d d4  d9 a3 f8 23 5f a3 0f 9c   I·Y····· ···#_···
00a0  63 0b 57 65 f4 55 34 7d  98 0a 21 e2 13 d5 aa 81   c·We·U4} ··!·····
00b0  ea 05 78 1d ee a2 91 6e  61 63 27 49 b2 1f 9e 96   ··x····n ac'I····
00c0  71 6f 52 bb 80 bc e8 60  d8 a6 4e 76 29 b0 0d 38   qoR····` ··Nv)··8
00d0  4e 11 cc 59 68 4d a4 37  0c c9 fb ac 5c d3 d0 2a   N··YhM·7 ····\··*
00e0  b9 25 4b 69 bb 97 9c f9  f7 43 3a a2 98 0e 51 52   ·%Ki···· ·C:···QR
00f0  5a 8e c9 f4 6a bf 3a 0f  59 25 1a 88 6f f6 b0 c2   Z···j·:· Y%··o···
0100  50 1c da 8d 5c 85 22 99  96 f4 c0 76 c2 2c 1a f7   P···\·"· ···v·,··
0110  51 fd 66 f1 c8 42 59 9e  da 5b f8 80 a3 2b 0c 70   Q·f··BY· ·[···+·p
0120  b9 78 9b 3b 55 98 6c 79  09 d8 c6 cf b9 51 60 9e   ·x·;U·ly ·····Q`·
0130  52 f6 ca 15 c0 07 90 66  f9 0d 13 16 c0 05 4d e2   R·····f ·····M·
0140  5d 4a 53 5e b9 22 fb 30  ed 81 7e e5 92 4f 06 28   ]JS^·"·0 ··~··O·(
0150  f8 3f e0 f0 33 30 5c 7b  cc 59 49 1b 80 de 91 c0   ·?··30\{ ·YI·····
0160  74 3a a6 f0 05 a4 2f 82  6b 82 84 32 d0 91 65 d9   t:····/· k··2··e·
0170  84 b0 d0 11 26 d8 18 49  e3 ad a7 98 e3 36 96 ed   ····&··I ·····6··
0180  71 91 c6 20 c5 ea 95 0d  2c 28 3e 46 d9 7c 10 00   q·· ···· ,(>F·|··
0190  c3 f1 f0 cb ac 38 fc ed  5d f6 46 c8 3b 71 59 16   ·····8·· ]·F·;qY·
01a0  55 41 31 74 ba 4a 99 42  46 a7 09 91 f7 e5 b5 b0   UA1t·J·B F·······
01b0  d9 86 82 79 fb 26 9e 94  03 4a df f7 ac fb 55 9e   ···y·&·· ·J····U·
01c0  26 3b f5 41 37 a7 c5 b8  2b 39 c9 41 5c 26 5f 51   &;·A7··· +9·A\&_Q
01d0  81 c6 3c 65 40 f9 d8 b9  77 78 86 7b ea 0a fc ae   ··<e@··· wx·{····
01e0  bb 36 68 18 e2 b3 3b 44  c7 6d 40 fa 0b 1e d9 3d   ·6h···;D ·m@····=
01f0  01 4c 91 87 60 83 36 37  7a bc 78 a0 38 27 a3 c3   ·L··`·67 z·x·8'··
0200  4a 0e ca 5f d8 0e 25 f0  b0 af 22 4d 12 b7 ba 20   J··_··%· ··"M···
0210  29 2d 4b e5 2a 93 84 4c  4e 3b 52 e7 57 d2 86 b9   )-K·*··L N;R·W···
0220  4b df 44 61 d6 9b c8 61  93 00 6c 42 58 af 38 65   K·Da···a ··lBX·8e
0230  f5 c0 8f ee 01 ad 9f 1b  99 a8 02 9a e2 89 7c 60   ········ ······|`
0240  36 03 aa c4 65 d0 11 f9  3c 8a 33 00 b5 b2 d8 b2   6···e··· <·3·····
0250  bc 96 f2 9f d3 94 17 a5  48 b1 d2 46 c3 d1 c5 70   ········ H··F···p
0260  b4 07 02 ed 69 83 96 b8  cd 43 b8 d4 55 ee dd d0   ····i··· ·C··U···
0270  19 85 0c 3d 5b 3d 16 e4  37 aa ab 16 38 7d 3d 06   ···=[=·· 7···8}=·
0280  00 82 43 a4 de 45 c9 8c  22 79 d7 29 68 7c 74 3f   ··C··E·· "y·)h|t?
0290  b0 e5 ed cb c3 cd ea 92  8d d0 5d 00 0a 06 0c bc   ········ ··]·····
02a0  43 77 f0 39 b4 95 3a 5c  ff 95 53 86 0b 49 c3 90   Cw·9··:\ ··S··I··
02b0  21 d6 f7 1f fe c4 03 a0  47 70 94 ad d0 5b 6b e7   !····· Gp···[k·
02c0  78 39 15 aa 3c 59 53 d3  04 00 df 4c 0d 2f 86 2a   x9··<YS· ···L·/·*
02d0  d9 49 0b 8a 6b d7 30 4f  ae 7c df 24 43 01 aa 1a   ·I··k·0O ·|·$C···
02e0  a8 40 b1 3f f0 46 f8 74  06 a3 88 b2 1c 0c 09 7e   ·@·?·F·t ·····~
```

6. Different Statistics:
Wi_Fi file capture

Wireshark · Capture File Properties · Wi-Fi

Details

File

Name:	C:\Users\USER\AppData\Local\Temp\wireshark_Wi-Fi_20200804211509_a01608.pcapng
Length:	24 kB
Hash (SHA256):	4a3e04fe356cd42feec021b0783dfd5fe39b096c76f1d7ead62b2fcea15c3b89
Hash (RIPEMD160):	c09df01ea64e532c2fed5079cee65dd1a640a9cb
Hash (SHA1):	e231768d84970f9830ff8449ad51c083aa64de6e
Format:	Wireshark/... - pcapng
Encapsulation:	Ethernet

Time

First packet:	2020-08-04 21:15:18
Last packet:	2020-08-04 21:15:44
Elapsed:	00:00:26

Capture

Hardware:	Intel(R) Core(TM) i3-10110U CPU @ 2.10GHz (with SSE4.2)
OS:	64-bit Windows 10 (1909), build 18363
Application:	Dumpcap (Wireshark) 3.2.5 (v3.2.5-0-ged20ddea8138)

Interfaces

Interface	Dropped packets	Capture filter	Link type	Packet size limit
Wi-Fi	Unknown	none	Ethernet	262144 bytes

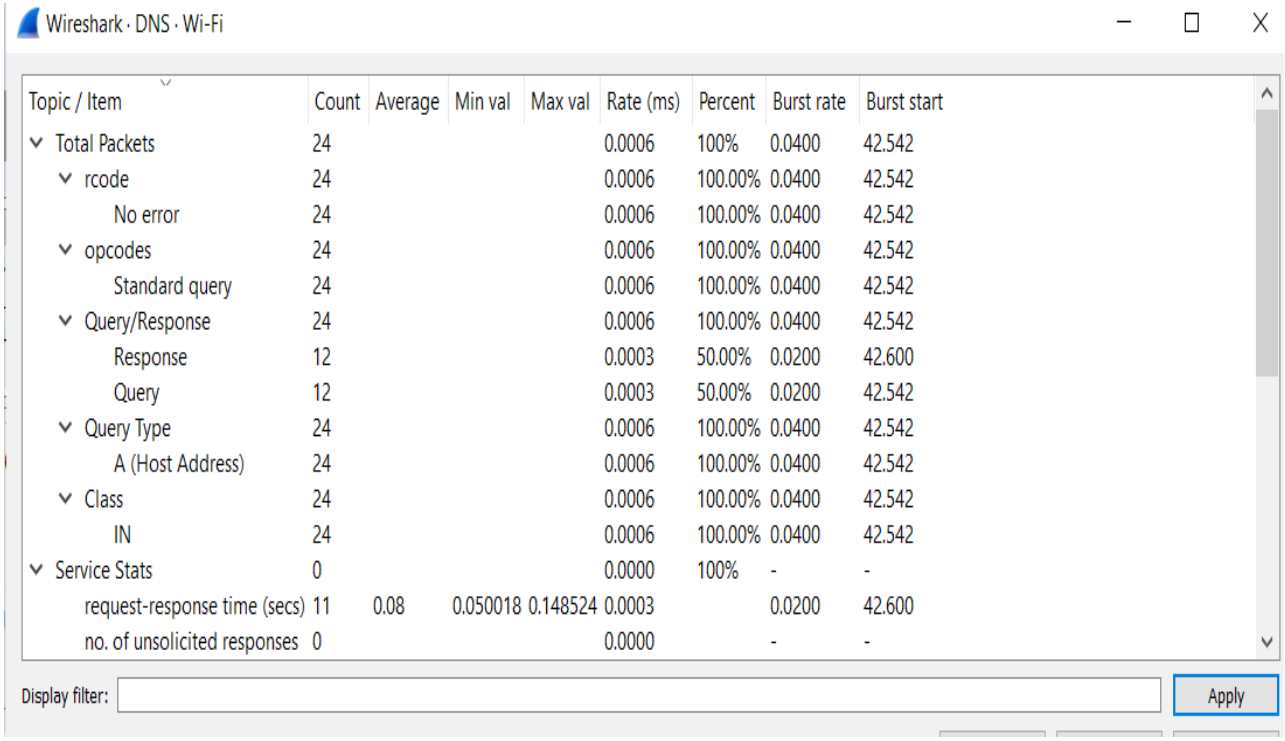
Statistics

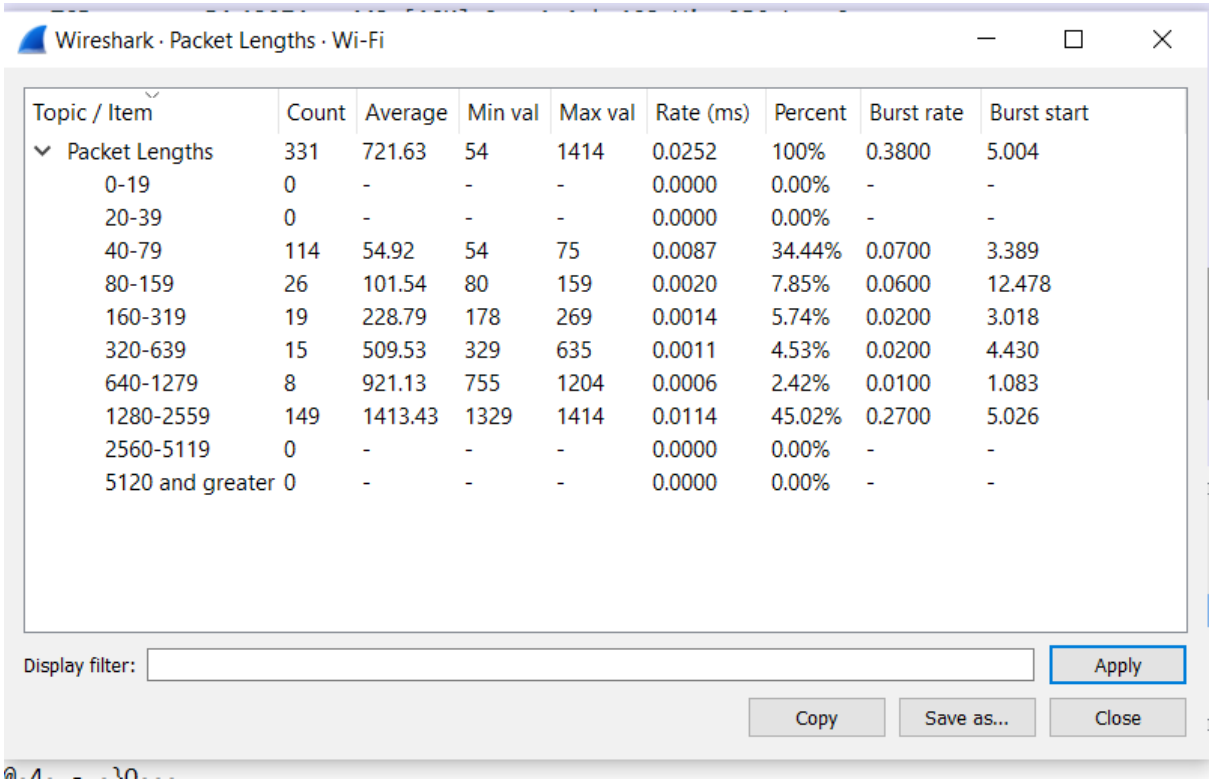
Measurement	Captured	Displayed	Marked
Packets	106	106 (100.0%)	—
Time span, s	26.030	26.030	—
Average pps	4.1	4.1	—
Average packet size, B	190	190	—
Bytes	20135	20135 (100.0%)	0
Average bytes/s	773	773	—
Average bits/s	6188	6188	—

Wireshark · Protocol Hierarchy Statistics · Wi-Fi

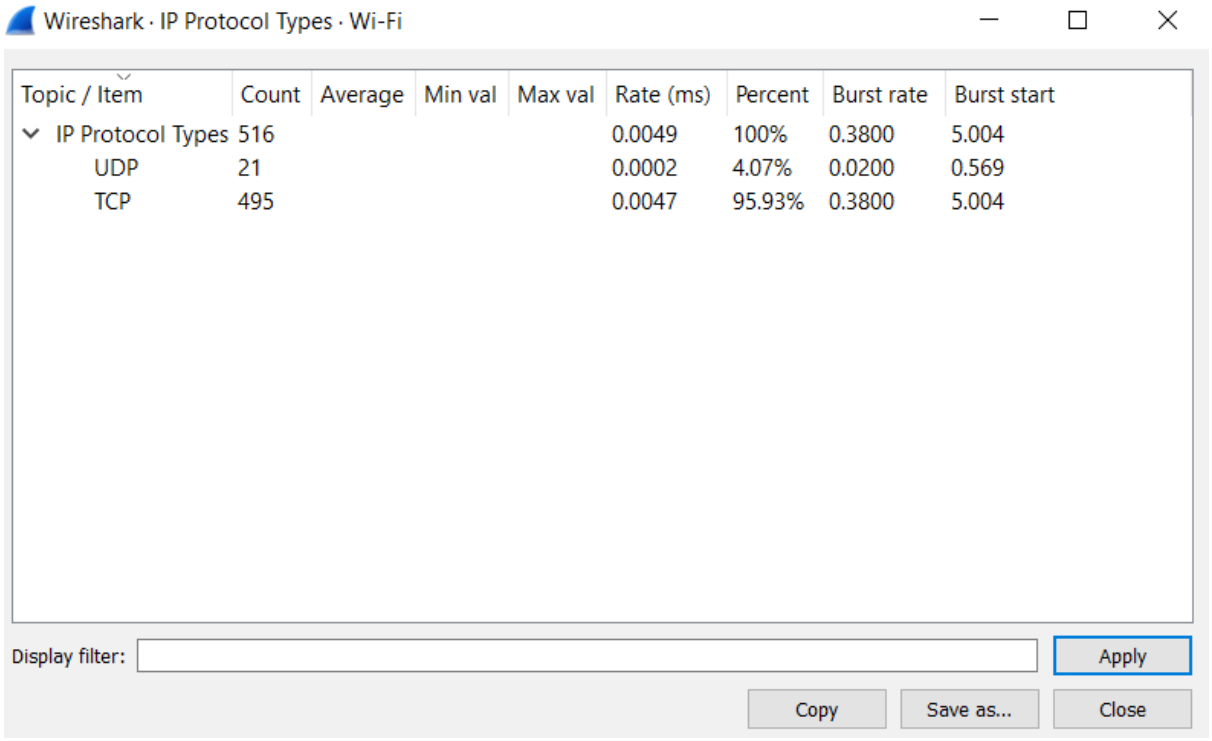
Protocol	Percent Packets	Packets	Percent Bytes	Bytes	Bits/s	End Packets	End Bytes	End Bits/s
Frame	100.0	739	100.0	330333	11 k	0	0	0
Ethernet	100.0	739	3.1	10346	345	0	0	0
Internet Protocol Version 4	99.2	733	4.4	14660	489	0	0	0
User Datagram Protocol	5.3	39	0.1	312	10	0	0	0
Simple Service Discovery Protocol	1.1	8	0.4	1392	46	8	1392	46
NetBIOS Name Service	2.0	15	0.2	750	25	15	750	25
Domain Name System	2.2	16	0.2	825	27	16	825	27
Transmission Control Protocol	93.9	694	91.4	301880	10 k	462	229342	7661
Transport Layer Security	30.7	227	86.0	284244	9496	222	231373	7729
Data	1.4	10	0.0	10	0	10	10	0
Address Resolution Protocol	0.8	6	0.1	168	5	6	168	5

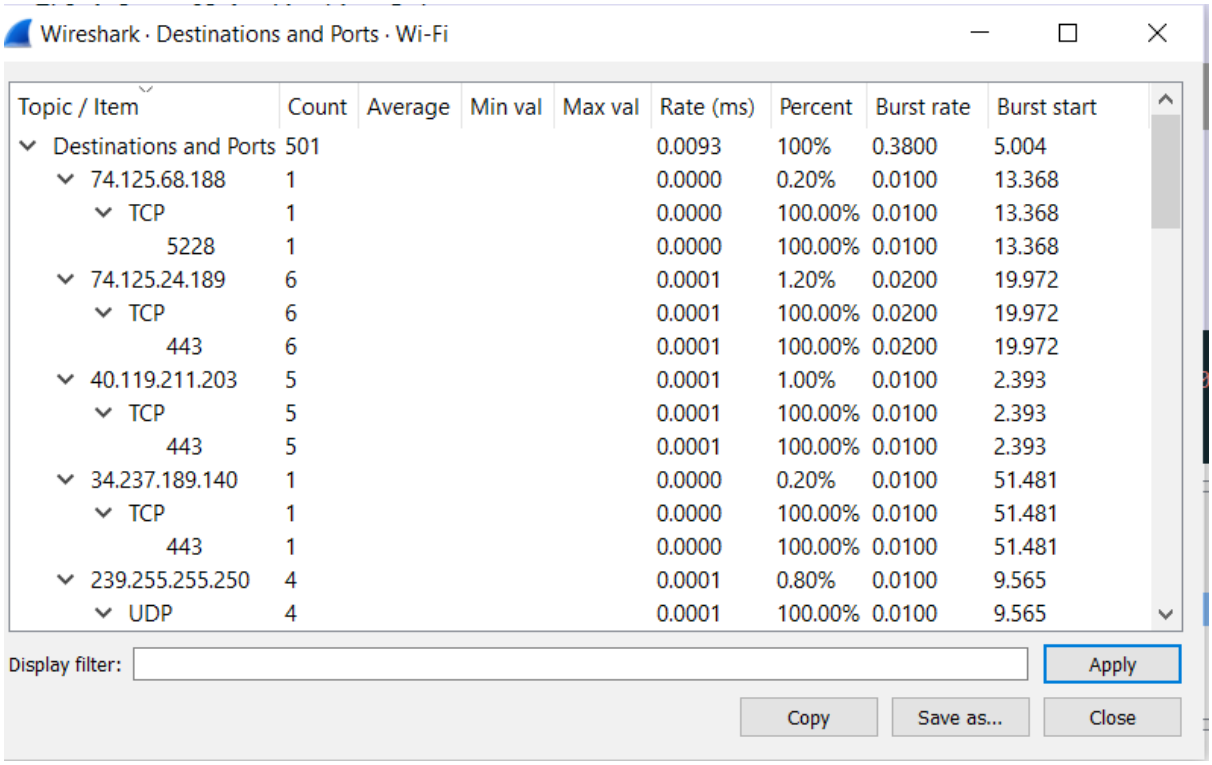
7. DNS


Wireshark · DNS · Wi-Fi
Topic / Item Count Average Min val Max val Rate (ms) Percent Burst rate Burst start
Total Packets 24 0.0006 100% 0.0400 42.542
rcode 24 0.0006 100.00% 0.0400 42.542
No error 24 0.0006 100.00% 0.0400 42.542
opcodes 24 0.0006 100.00% 0.0400 42.542
Standard query 24 0.0006 100.00% 0.0400 42.542
Query/Response 24 0.0006 100.00% 0.0400 42.542
Response 12 0.0003 50.00% 0.0200 42.600
Query 12 0.0003 50.00% 0.0200 42.542
Query Type 24 0.0006 100.00% 0.0400 42.542
A (Host Address) 24 0.0006 100.00% 0.0400 42.542
Class 24 0.0006 100.00% 0.0400 42.542
IN 24 0.0006 100.00% 0.0400 42.542
Service Stats 0 0.0000 100% - -
request-response time (secs) 11 0.08 0.050018 0.148524 0.0003 0.0200 42.600
no. of unsolicited responses 0 0.0000 - -
Display filter:
Apply

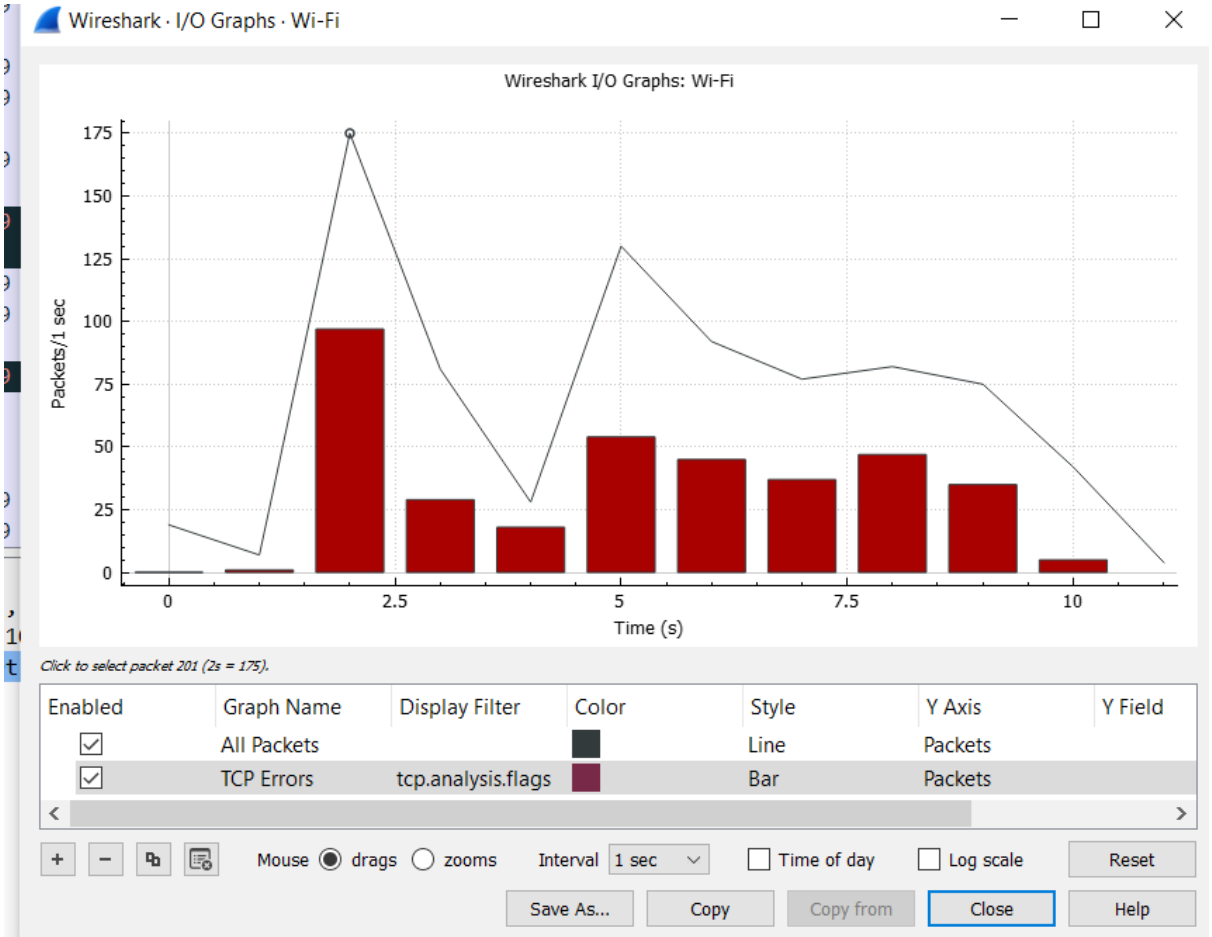

Wireshark · Packet Lengths · Wi-Fi
Topic / Item Count Average Min val Max val Rate (ms) Percent Burst rate Burst start
Packet Lengths 331 721.63 54 1414 0.0252 100% 0.3800 5.004
0-19 0 - - - 0.0000 0.00% - -
20-39 0 - - - 0.0000 0.00% - -
40-79 114 54.92 54 75 0.0087 34.44% 0.0700 3.389
80-159 26 101.54 80 159 0.0020 7.85% 0.0600 12.478
160-319 19 228.79 178 269 0.0014 5.74% 0.0200 3.018
320-639 15 509.53 329 635 0.0011 4.53% 0.0200 4.430
640-1279 8 921.13 755 1204 0.0006 2.42% 0.0100 1.083
1280-2559 149 1413.43 1329 1414 0.0114 45.02% 0.2700 5.026
2560-5119 0 - - - 0.0000 0.00% - -
5120 and greater 0 - - - 0.0000 0.00% - -
Display filter:
Apply
Copy
Save as...
Close

8. Protocl have been used:





9. Error & Success Rates:



10. Real time Response: