

1. Utilizând utilitarul Protocol Hierarchy din cadrul wireshark stabiliți ce protocol este folosit mai mult. Dați răspunsul în valori procentuale.

Wireshark - Protocol Hierarchy Statistics - WiFi

Protocol	Percent Packets	Packets	Percent Bytes	Bytes	Bits/s	End Packets	End Bytes	End Bits/s	PDU's
▼ Frame	100.0	277	100.0	116933	85 k	0	0	0	277
▼ Ethernet	100.0	277	3.4	3969	2900	0	0	0	277
▼ Internet Protocol Version 6	1.4	4	0.1	160	116	0	0	0	4
User Datagram Protocol	1.4	4	0.0	32	23	0	0	0	4
Multicast Domain Name System	1.1	3	0.1	120	87	3	120	87	3
eXtensible Markup Language	0.4	1	0.6	656	479	1	656	479	1
▼ Internet Protocol Version 4	98.6	273	4.7	5460	3990	0	0	0	273
User Datagram Protocol	10.5	29	0.2	232	169	0	0	0	29
QUIC IETF	0.4	1	1.1	1250	913	1	1250	913	1
Multicast Domain Name System	4.3	12	1.2	1418	1036	12	1418	1036	12
Domain Name System	5.8	16	1.3	1480	1081	16	1480	1081	16
▼ Transmission Control Protocol	88.1	244	4.6	5324	3891	157	3584	2619	244
Transport Layer Security	31.4	87	86.4	101057	73 k	81	76189	55 k	91
Malformed Packet	2.2	6	0.0	0	0	6	0	0	6

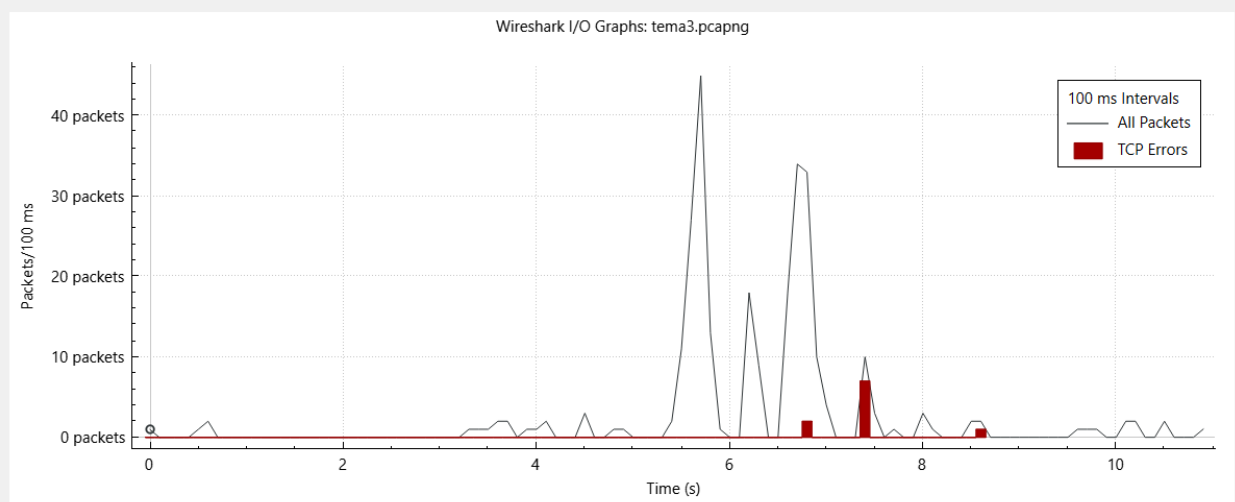
IPv6: 1.4% din pachete

IPv4: 98.6% din pachete

TCP: 88.1% din pachete

Astfel, protocolul IPv4 a fost utilizat mai mult în această trasă.

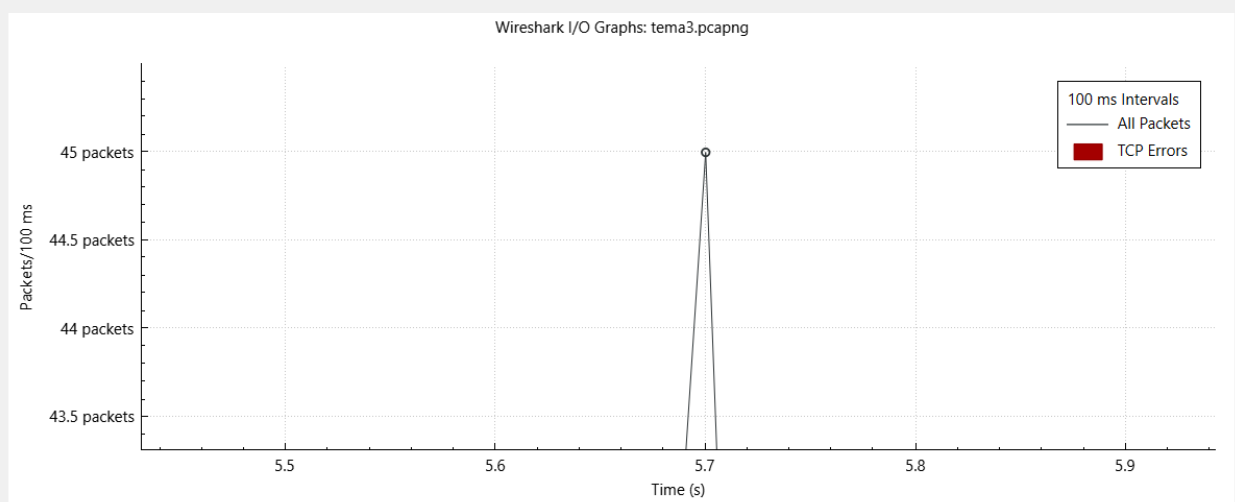
2. Utilizând utilitarul I/O Graph schimbați baza de timp la 1/10 dintr-o secundă și răspundeți la următoarele întrebări:
 - a. Care este volumul maxim de pachete/s și când îl găsiți?



Click to select packet 1 (0.0s = 1).

Enabled	Graph Name	Display Filter	Color	Style	Y Axis	Y Field	SMA Period	Y Axis Factor
<input checked="" type="checkbox"/>	All Packets			Line	Packets		None	1
<input checked="" type="checkbox"/>	TCP Errors	tcp.analysis.flags		Bar	Packets		None	1

Mouse ☒ drags ☐ zooms
 Interval 100 ms
☐ Time of day
 ☐ Log scale
 ☒ Automatic update
 ☒ Enable legend



Click to select packet 105 (5.7s = 45).

Enabled	Graph Name	Display Filter	Color	Style	Y Axis	Y Field	SMA Period	Y Axis Factor
<input checked="" type="checkbox"/>	All Packets			Line	Packets		None	1
<input checked="" type="checkbox"/>	TCP Errors	tcp.analysis.flags		Bar	Packets		None	1

Mouse ☒ drags ☐ zooms
 Interval 100 ms
☐ Time of day
 ☐ Log scale
 ☒ Automatic update
 ☒ Enable legend

Volumul maxim de date este la secunda 5.7 și este de 45 pachete.

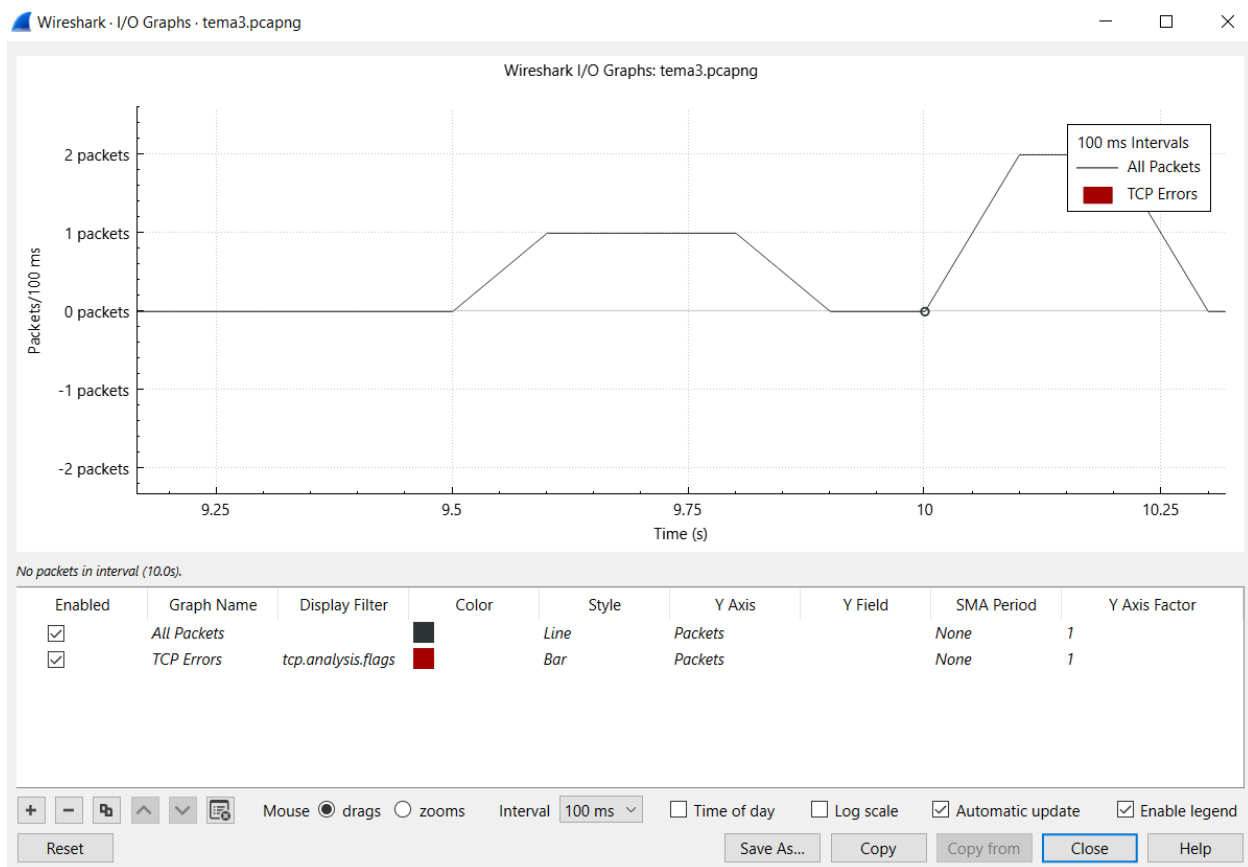
b. care este volumul de date la secundă=nr_litere_nume+nr_litere_prename

Număr litere nume (Plesa) = 5

Număr litere prename (Diana) = 5

Secunda = 5 + 5 = 10

Volumul de date la secunda 10 = 0 pachete



3. Utilizând o trasă de wireshark, care este dimensiunea antetului UDP, dacă luăm în considerare mai multe pachete.

No.	Time	Source	Destination	Protocol	Length	Info
16	4.501637	192.168.4.104	172.217.18.17	TCP		55 59545 → 44
17	4.572306	10.11.2.46	224.0.0.251	MDNS		100 Standard c
18	4.572827	172.217.18.17	192.168.4.104	TCP		68 443 → 5954
19	4.890174	192.168.4.104	142.250.185.238	TCP		55 59547 → 44
20	4.941910	142.250.185.238	192.168.4.104	TCP		68 443 → 5954
21	5.480757	192.168.4.104	192.168.4.1	DNS		94 Standard c
22	5.481072	192.168.4.104	192.168.4.1	DNS		94 Standard c
23	5.527171	192.168.4.1	192.168.4.104	DNS		138 Standard c
24	5.531906	192.168.4.1	192.168.4.104	DNS		177 Standard c
25	5.532617	192.168.4.104	52.236.29.249	TCP		66 59902 → 44
26	5.587792	192.168.4.104	192.168.4.1	DNS		128 Standard c

Wireshark · Packet 17 · tema3.pcapng

```

> Frame 17: 100 bytes on wire (800 bits), 100 bytes captured (800 bits) on interface
> Ethernet II, Src: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: IPv4mcast_fb (0
> Internet Protocol Version 4, Src: 10.11.2.46, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (query)

```

```

0000  01 00 5e 00 00 fb 14 cc 20 63 ce e8 08 00 45 00  ..^.... c....E.
0010  00 56 6b 50 00 00 ff 11 63 12 0a 0b 02 2e e0 00  .VkP.... c....
0020  00 fb 14 e9 14 e9 00 42 ba e2 00 00 00 00 00 02  .....B.....
0030  00 00 00 00 00 00 07 5f 72 64 6c 69 6e 6b 04 5f  .....rdlink._
0040  74 63 70 05 6c 6f 63 61 6c 00 00 0c 00 01 0f 5f  tcp·local.....
0050  63 6f 6d 70 61 6e 69 6f 6e 2d 6c 69 6e 6b c0 14  companio n-link..
0060  00 0c 00 01

```

User Datagram Protocol (udp), 8 bytes

```

> Frame 22: 94 bytes on wire (752 bits), 94 bytes captured (752 bits) on interface \Device\NPF{...}
> Ethernet II, Src: Intel_60:e1:7c (5c:80:b6:60:e1:7c), Dst: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8)
> Internet Protocol Version 4, Src: 192.168.4.104, Dst: 192.168.4.1
> User Datagram Protocol, Src Port: 57248, Dst Port: 53
> Domain Name System (query)

```

0000	14 cc 20 63 ce e8 5c 80 b6 60 e1 7c 08 00 45 00	.. c... \. E .
0010	00 50 ce eb 00 00 80 11 e1 f7 c0 a8 04 68 c0 a8	. P h . .
0020	04 01 df a0 00 35 00 3c 8c 9d ac 0e 01 00 00 01 5 <
0030	00 00 00 00 00 00 04 70 72 6f 64 0f 72 65 77 61 p rod .rewa
0040	72 64 73 70 6c 61 74 66 6f 72 6d 09 6d 69 63 72	rd splatf orm . micr
0050	6f 73 6f 66 74 03 63 6f 6d 00 00 41 00 01	osoft .co m . . A . .

User Datagram Protocol (udp), 8 bytes

```

> Frame 24: 177 bytes on wire (1416 bits), 177 bytes captured (1416 bits) on interface \Device\NPF{...}
> Ethernet II, Src: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: Intel_60:e1:7c (5c:80:b6:60:e1:7c)
> Internet Protocol Version 4, Src: 192.168.4.1, Dst: 192.168.4.104
> User Datagram Protocol, Src Port: 53, Dst Port: 58039
> Domain Name System (response)

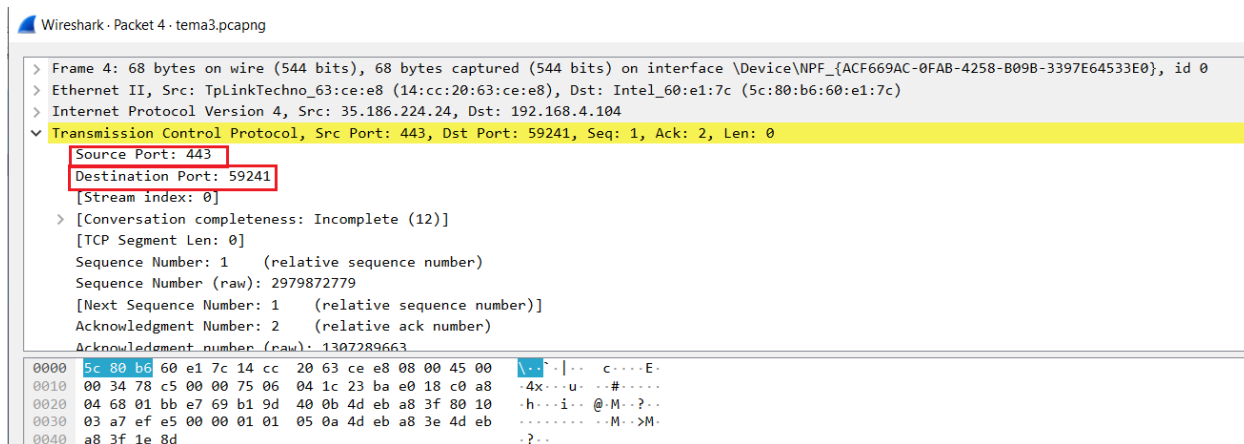
```

0000	5c 80 b6 60 e1 7c 14 cc 20 63 ce e8 08 00 45 00	\. c . . . E .
0010	00 a3 07 dd 00 00 3f 11 e9 b3 c0 a8 04 01 c0 a8 ?
0020	04 68 00 35 e2 b7 00 8f 07 f1 cc 9f 81 80 00 01	. h 5
0030	00 03 00 00 00 00 04 70 72 6f 64 0f 72 65 77 61 p rod .rewa
0040	72 64 73 70 6c 61 74 66 6f 72 6d 09 6d 69 63 72	rd splatf orm . micr
0050	6f 73 6f 66 74 03 63 6f 6d 00 00 01 00 01 c0 0c	osoft .co m
0060	00 05 00 01 00 00 00 3f 00 20 0b 72 65 77 61 72 ? . . .rewar
0070	64 73 70 72 6f 64 0e 74 72 61 66 66 69 63 6d 61	dsprod .t rafficma
0080	6e 61 67 65 72 03 6e 65 74 00 c0 40 00 05 00 01	nager .ne t . . @ . . .
0090	00 00 00 3c 00 0b 08 70 72 6f 64 2d 34 63 31 c0	. . . < . . p rod -4c1 .
00a0	11 c0 6c 00 01 00 01 00 00 00 b2 00 04 34 ec 1d	. . 1 4 . .
00b0	f9	.

User Datagram Protocol (udp), 8 bytes

Dimensiunea antetului UDP este de 8 bytes.

4. Utilizând al 4-lea cadru (frame), care este portul sursă și portul destinație al cadrului?



Port sursă: 443

Port destinație: 59241

5. Pentru cel de-al 3-lea cadru DNS, care este suma, în octeți, a tuturor anetelor cadrului?

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dns

No.	Time	Source	Destination	Protocol
21	5.480757	192.168.4.104	192.168.4.1	DNS
22	5.481072	192.168.4.104	192.168.4.1	DNS
23	5.527171	192.168.4.1	192.168.4.104	DNS
24	5.531906	192.168.4.1	192.168.4.104	DNS
26	5.587792	192.168.4.104	192.168.4.1	DNS
27	5.588145	192.168.4.104	192.168.4.1	DNS
36	5.601154	192.168.4.1	192.168.4.104	DNS
37	5.601154	192.168.4.1	192.168.4.104	DNS
157	6.672372	192.168.4.104	192.168.4.1	DNS
158	6.672638	192.168.4.104	192.168.4.1	DNS
161	6.683403	192.168.4.1	192.168.4.104	DNS
162	6.687709	192.168.4.1	192.168.4.104	DNS
170	6.712432	192.168.4.104	192.168.4.1	DNS
171	6.712752	192.168.4.104	192.168.4.1	DNS
176	6.732227	192.168.4.1	192.168.4.104	DNS
177	6.732227	192.168.4.1	192.168.4.104	DNS

```

> Frame 23: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on interface \Device\NPF_{ACF669AC-0FAB-4258-B09B-3397E64533E0}, id 0
> Ethernet II, Src: TpLinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: Intel_60:e1:7c (5c:80:b6:60:e1:7c)
> Internet Protocol Version 4, Src: 192.168.4.1, Dst: 192.168.4.104
> User Datagram Protocol, Src Port: 53, Dst Port: 57248
> Domain Name System (response)

```

```

0000  5c 80 b6 60 e1 7c 14 cc 20 63 ce e8 08 00 45 00  \...|...c...E-
0010  00 7c 07 d0 00 00 3f 11 e9 e7 c0 a8 04 01 c0 a8  -|....?.....
0020  04 68 00 35 df a0 00 68 4c 7b ac 0e 81 80 00 01  .h.5...hL{.....
0030  00 01 00 00 00 00 04 70 72 6f 64 0f 72 65 77 61  .....p rod.rewa
0040  72 64 73 70 6c 61 74 66 6f 72 6d 09 6d 69 63 72  rdsplatf orm-micr
0050  6f 73 6f 66 74 03 63 6f 6d 00 00 41 00 01 c0 0c  osoft.co m..A....
0060  00 05 00 01 00 00 00 3f 00 20 0b 72 65 77 61 72  .....? ..rewar
0070  64 73 70 72 6f 64 0e 74 72 61 66 66 69 63 6d 61  dsprod-t rafficma
0080  6e 61 67 65 72 03 6e 65 74 00                    nager-ne t-

```

Internet Protocol Version 4 (ip) 20 bytes

```

> Frame 23: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on interface \Device\NPF_{ACF669AC-0FAB-4258-B09B-3397E64533E0}, id 0
> Ethernet II, Src: TpLinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: Intel_60:e1:7c (5c:80:b6:60:e1:7c)
> Internet Protocol Version 4, Src: 192.168.4.1, Dst: 192.168.4.104
> User Datagram Protocol, Src Port: 53, Dst Port: 57248
> Domain Name System (response)

```

```

0000  5c 80 b6 60 e1 7c 14 cc 20 63 ce e8 08 00 45 00  \...|...c...E-
0010  00 7c 07 d0 00 00 3f 11 e9 e7 c0 a8 04 01 c0 a8  -|....?.....
0020  04 68 00 35 df a0 00 68 4c 7b ac 0e 81 80 00 01  .h.5...hL{.....
0030  00 01 00 00 00 00 04 70 72 6f 64 0f 72 65 77 61  .....p rod.rewa
0040  72 64 73 70 6c 61 74 66 6f 72 6d 09 6d 69 63 72  rdsplatf orm-micr
0050  6f 73 6f 66 74 03 63 6f 6d 00 00 41 00 01 c0 0c  osoft.co m..A....
0060  00 05 00 01 00 00 00 3f 00 20 0b 72 65 77 61 72  .....? ..rewar
0070  64 73 70 72 6f 64 0e 74 72 61 66 66 69 63 6d 61  dsprod-t rafficma
0080  6e 61 67 65 72 03 6e 65 74 00                    nager-ne t-

```

User Datagram Protocol (udp) 8 bytes

```
> Frame 23: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on in
> Ethernet II, Src: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: Intel_60:e1
> Internet Protocol Version 4, Src: 192.168.4.1, Dst: 192.168.4.104
> User Datagram Protocol, Src Port: 53, Dst Port: 57248
> Domain Name System (response)
```

0000	5c 80 b6 60 e1 7c 14 cc 20 63 ce e8 08 00 45 00	\..`. .. c....E.
0010	00 7c 07 d0 00 00 3f 11 e9 e7 c0 a8 04 01 c0 a8	·?·
0020	04 68 00 35 df a0 00 68 4c 7b ac 0e 81 80 00 01	·h·5...h L{.....
0030	00 01 00 00 00 00 04 70 72 6f 64 0f 72 65 77 61p rod·rewa
0040	72 64 73 70 6c 61 74 66 6f 72 6d 09 6d 69 63 72	rdspatf orm·micr
0050	6f 73 6f 66 74 03 63 6f 6d 00 00 41 00 01 c0 0c	rosoft·co m·A....
0060	00 05 00 01 00 00 00 3f 00 20 0b 72 65 77 61 72? · ·rewar
0070	64 73 70 72 6f 64 0e 74 72 61 66 66 69 63 6d 61	dsprod·t rafficma
0080	6e 61 67 65 72 03 6e 65 74 00	nager·ne t·

Ethernet (eth), 14 bytes

Antet IPv4 = 20 bytes

Antet UDP = 8 bytes

Antet Ethernet = 14 bytes

20 + 8 + 14 = 42 bytes

6. Care este socket-ul pentru sursă celui de-al 10-lea cadru TCP?

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tcp

No.	Time	Source	Destination	Protocol	Length	Info
2	0.576963	192.168.4.104	35.186.224.24	TCP	55	59241 → 443 [ACK] Seq=1 Ack=1 Win=511 Len=1
4	0.632876	35.186.224.24	192.168.4.104	TCP	68	443 → 59241 [ACK] Seq=1 Ack=2 Win=935 Len=0 SLE=1 SRE=2
5	3.370801	192.168.4.104	142.250.185.106	TCP	55	59534 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
6	3.425991	142.250.185.106	192.168.4.104	TCP	68	443 → 59534 [ACK] Seq=1 Ack=2 Win=1043 Len=0 SLE=1 SRE=2
7	3.597884	192.168.4.104	142.250.185.130	TCP	55	59532 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
8	3.650044	142.250.185.130	192.168.4.104	TCP	68	443 → 59532 [ACK] Seq=1 Ack=2 Win=1043 Len=0 SLE=1 SRE=2
9	3.674525	192.168.4.104	74.125.128.101	TCP	55	59536 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
11	3.737187	74.125.128.101	192.168.4.104	TCP	68	443 → 59536 [ACK] Seq=1 Ack=2 Win=1043 Len=0 SLE=1 SRE=2
12	3.992751	192.168.4.104	216.58.206.74	TCP	55	59541 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
13	4.054113	216.58.206.74	192.168.4.104	TCP	68	443 → 59541 [ACK] Seq=1 Ack=2 Win=1044 Len=0 SLE=1 SRE=2
14	4.136661	192.168.4.104	216.58.206.74	TCP	55	59542 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
15	4.195255	216.58.206.74	192.168.4.104	TCP	68	443 → 59542 [ACK] Seq=1 Ack=2 Win=1034 Len=0 SLE=1 SRE=2

Wireshark · Packet 13 · tema3.pcapng

> Frame 13: 68 bytes on wire (544 bits), 68 bytes captured (544 bits) on interface \Device\NPF_{ACF669AC-0FAB-4258-B09B-3397E64533E0}, id 0

> Ethernet II, Src: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: Intel_60:e1:7c (5c:80:b6:60:e1:7c)

> Internet Protocol Version 4, Src: 216.58.206.74, Dst: 192.168.4.104

0100 = Version: 4
 0101 = Header Length: 20 bytes (5)

> Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
 Total Length: 52
 Identification: 0xfce3 (64739)

> 000. = Flags: 0x0
 ...0 0000 0000 0000 = Fragment Offset: 0
 Time to Live: 118
 Protocol: TCP (6)
 Header Checksum: 0xdc4a [validation disabled]
 [Header checksum status: Unverified]
Source Address: 216.58.206.74
 Destination Address: 192.168.4.104
 [Stream index: 6]

> Transmission Control Protocol, Src Port: 443, Dst Port: 59541, Seq: 1, Ack: 2, Len: 0

```

0000  5c 80 b6 60 e1 7c 14 cc 20 63 ce e8 08 00 45 00  \...|.. c...E.
0010  00 34 fc e3 00 00 76 06 dc 4a d8 3a ce 4a c0 a8  -4...v..J.:J..
0020  04 68 01 bb e8 95 65 8c c7 1c d3 cf cf ef 80 10  -h...e.....
0030  04 14 07 dc 00 00 01 01 05 0a d3 cf cf ee d3 cf  .....
0040  cf ef 1f 86                                     ....

```

Wireshark · Packet 13 · tema3.pcapng

> Frame 13: 68 bytes on wire (544 bits), 68 bytes captured (544 bits) on interface \Device\NPF_{ACF669AC-0FAB-4258-B09B-3397E64533E0}, id 0

> Ethernet II, Src: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8), Dst: Intel_60:e1:7c (5c:80:b6:60:e1:7c)

> Internet Protocol Version 4, Src: 216.58.206.74, Dst: 192.168.4.104

> Transmission Control Protocol, Src Port: 443, Dst Port: 59541, Seq: 1, Ack: 2, Len: 0

Source Port: 443
 Destination Port: 59541
 [Stream index: 4]

> [Conversation completeness: Incomplete (12)]
 [TCP Segment Len: 0]
 Sequence Number: 1 (relative sequence number)
 Sequence Number (raw): 1703724828
 [Next Sequence Number: 1 (relative sequence number)]
 Acknowledgment Number: 2 (relative ack number)
 Acknowledgment number (raw): 3553611759
 1000 = Header Length: 32 bytes (8)

> Flags: 0x010 (ACK)
 000. = Reserved: Not set
 ...0 = Accurate ECN: Not set

```

0000  5c 80 b6 60 e1 7c 14 cc 20 63 ce e8 08 00 45 00  \...|.. c...E.
0010  00 34 fc e3 00 00 76 06 dc 4a d8 3a ce 4a c0 a8  -4...v..J.:J..
0020  04 68 01 bb e8 95 65 8c c7 1c d3 cf cf ef 80 10  -h...e.....
0030  04 14 07 dc 00 00 01 01 05 0a d3 cf cf ee d3 cf  .....
0040  cf ef 1f 86                                     ....

```

Source IPv4 Address: 216.58.206.74

Source TCP Port: 443

Socket = IPv4 Source Address:TCP Source Port

Socket = 216.58.206.74:443

7. Care este diferența de timp între mesajele SYN și SYN-ACK ale unui singur transfer.
Vă rugăm adresați-vă câmpului „Info” din fereastra wireshark pentru a identifica mesajele.

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tcp

No.	Time	Source	Destination	Protocol	Length	Info
94	5.789157	52.236.29.249	192.168.4.104	TLSv1.3	133	Application Data
93	5.786599	52.236.29.249	192.168.4.104	TLSv1.3	133	Application Data
75	5.763832	192.168.4.104	20.250.77.142	TLSv1.3	161	Application Data
64	5.723663	192.168.4.104	52.236.29.249	TLSv1.3	1263	Application Data
63	5.723398	192.168.4.104	52.236.29.249	TLSv1.3	146	Application Data
57	5.666468	52.236.29.249	192.168.4.104	TLSv1.3	1230	Application Data
33	5.588458	192.168.4.104	20.190.147.5	TLSv1.2	1208	Application Data
28	5.588357	192.168.4.104	20.190.147.5	TLSv1.2	519	Application Data
178	6.732905	192.168.4.104	13.107.5.80	TCP	66	59911 → 443 [SYN] Seq=0 Win=64240 Len=0
245	7.072236	192.168.4.104	13.107.5.80	TCP	54	59911 → 443 [ACK] Seq=2990 Ack=10735 Win=0 Len=0
239	6.968844	192.168.4.104	13.107.5.80	TCP	54	59911 → 443 [ACK] Seq=2882 Ack=9977 Win=0 Len=0
236	6.965098	192.168.4.104	13.107.5.80	TCP	54	59911 → 443 [ACK] Seq=2882 Ack=9418 Win=0 Len=0
230	6.891464	192.168.4.104	13.107.5.80	TCP	54	59911 → 443 [ACK] Seq=2851 Ack=7927 Win=0 Len=0
217	6.858393	192.168.4.104	13.107.5.80	TCP	54	59911 → 443 [ACK] Seq=2299 Ack=7406 Win=0 Len=0
215	6.847744	192.168.4.104	13.107.5.80	TCP	54	59911 → 443 [ACK] Seq=2299 Ack=7400 Win=0 Len=0
214	6.847685	192.168.4.104	13.107.5.80	TCP	66	59911 → 443 [ACK] Seq=2299 Ack=4480 Win=0 Len=0

tcp

No.	Time	Source	Destination	Protocol	Length	Info
30	5.588458	192.168.4.104	20.190.147.5	TCP	1494	59704 → 443 [ACK] Seq=1906 Ack=1 Win=517 Len=1440 [TCP PDU reassembled in 33]
54	5.664056	192.168.4.104	142.250.185.99	TCP	55	59613 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
60	5.684163	192.168.4.104	142.250.185.78	TCP	55	59610 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
277	10.945478	192.168.4.104	172.217.18.99	TCP	55	59551 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
260	8.025048	192.168.4.104	142.250.185.206	TCP	55	59550 → 443 [ACK] Seq=1 Ack=1 Win=508 Len=1
19	4.890174	192.168.4.104	142.250.185.238	TCP	55	59547 → 443 [ACK] Seq=1 Ack=1 Win=511 Len=1
16	4.501637	192.168.4.104	172.217.18.17	TCP	55	59545 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
41	5.608688	192.168.4.104	142.250.145.84	TCP	55	59543 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
14	4.136661	192.168.4.104	216.58.206.74	TCP	55	59542 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
12	3.992751	192.168.4.104	216.58.206.74	TCP	55	59541 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
9	3.674525	192.168.4.104	74.125.128.101	TCP	55	59536 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
5	3.370801	192.168.4.104	142.250.185.106	TCP	55	59534 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
7	3.597884	192.168.4.104	142.250.185.130	TCP	55	59532 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
261	8.073517	192.168.4.104	172.217.16.129	TCP	55	59530 → 443 [ACK] Seq=1 Ack=1 Win=512 Len=1
272	10.188228	192.168.4.104	142.250.185.238	TCP	54	59501 → 443 [FIN, ACK] Seq=1 Ack=74 Win=512 Len=0
274	10.247147	192.168.4.104	142.250.185.238	TCP	54	59501 → 443 [ACK] Seq=2 Ack=75 Win=512 Len=0
2	0.576963	192.168.4.104	35.186.224.24	TCP	55	59241 → 443 [ACK] Seq=1 Ack=1 Win=511 Len=1
186	6.785682	13.107.5.80	192.168.4.104	TCP	68	443 → 59911 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1440 WS=256 SACK_PERM=1
242	7.024793	13.107.5.80	192.168.4.104	TCP	56	443 → 59911 [ACK] Seq=9977 Ack=2990 Win=4193280 Len=0
235	6.965047	13.107.5.80	192.168.4.104	TCP	1514	443 → 59911 [ACK] Seq=7958 Ack=2882 Win=4193280 Len=1460 [TCP PDU reassembled]

Timp SYN = 6.732905

Timp SYN-ACK = 6.785682

6.732905 – 6.785682 = -0.052777

8. Vă rugăm calculați suma tuturor antetelor unui cadru TCP, având date utile (payload). Pentru o parcurgere mai facilă utilizați filtre de display(Display filter).

tema3.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Current filter: tcp.len > 0

Packet list Display filter tcp.len > 0

Options: Narrow & Wide ☐ Case sensitive ☐ Backwards ☐ Multiple occurrences

No.	Time	Source	Destination	Protocol	Length	Info
188	6.786368	192.168.4.104	13.107.5.80	TCP	1494	59911 → 443 [ACK] Seq=1 Acl
174	6.730419	192.168.4.104	20.190.183.26	TCP	1494	59909 → 443 [ACK] Seq=1 Acl
167	6.701790	192.168.4.104	204.79.197.239	TCP	1494	59908 → 443 [ACK] Seq=2251
155	6.670466	192.168.4.104	204.79.197.239	TCP	1494	59908 → 443 [ACK] Seq=1 Acl
135	6.284495	192.168.4.104	204.79.197.239	TCP	1494	59906 → 443 [ACK] Seq=2018
123	6.252502	192.168.4.104	204.79.197.239	TCP	1494	59906 → 443 [ACK] Seq=1 Acl
74	5.763832	192.168.4.104	20.250.77.142	TCP	1494	59904 → 443 [ACK] Seq=3367
73	5.763832	192.168.4.104	20.250.77.142	TCP	1494	59904 → 443 [ACK] Seq=1927
49	5.656882	192.168.4.104	20.250.77.142	TCP	1494	59904 → 443 [ACK] Seq=1 Acl
38	5.601800	192.168.4.104	52.236.29.249	TCP	1494	59902 → 443 [ACK] Seq=1 Acl
32	5.588458	192.168.4.104	20.190.147.5	TCP	1494	59704 → 443 [ACK] Seq=4786
29	5.588458	192.168.4.104	20.190.147.5	TCP	1494	59704 → 443 [ACK] Seq=466
31	5.588458	192.168.4.104	20.190.147.5	TCP	1494	59704 → 443 [ACK] Seq=3346
30	5.588458	192.168.4.104	20.190.147.5	TCP	1494	59704 → 443 [ACK] Seq=1906

Wireshark · Packet 31 · tema3.pcapng

> Frame 31: 1494 bytes on wire (11952 bits), 1494 bytes captured (11952 bits) on interface \Device\NPF_{ACF669AC-0FAB-4258-B09B-3397E64533E0}, id 0

> Ethernet II, Src: Intel_60:e1:7c (5c:80:b6:60:e1:7c), Dst: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e8)

> Internet Protocol Version 4, Src: 192.168.4.104, Dst: 20.190.147.5

> Transmission Control Protocol, Src Port: 59704, Dst Port: 443, Seq: 3346, Ack: 1, Len: 1440

0000 14 cc 20 63 ce e8 5c 80 b6 60 e1 7c 08 00 45 00 .. c.. \. . . | .E.
0010 05 c8 7d 18 40 00 80 06 0b 44 c0 a8 04 68 14 be ..) .@... .D...h..
0020 93 05 e9 38 01 bb e1 6d 1d 7c cd ac 9a f8 50 10 ..8...m .|...P..
0030 02 05 f2 af 00 00 86 75 76 53 98 cf 68 05 c2 9eu vS...h...
0040 49 96 89 6a 0b 46 32 95 3c 15 6b 37 c7 e5 85 82 I...j.F2. <.k7....
0050 c5 da be a3 42 b8 0e d4 92 50 ce 0d e4 af 82 aaB... .P.....
0060 98 ad 16 32 4d 32 0c 06 08 a2 a8 af 39 15 f5 fa ...2M2... ..9...
0070 1b 1d 65 62 19 2c 9b 8f cc c3 34 a7 30 61 af 13 ..eb... ..4.0a..
0080 93 00 24 4f d2 ed f4 c3 0f 08 43 1a f5 72 a1 69 ..\$0.... .C...r.i
0090 5f 27 2c 51 64 f7 6c 40 df a7 d5 cc e6 86 53 a3 _',Qd.l@S..
00a0 91 c7 e7 f6 73 6e 6d 78 72 8a 77 c1 d3 4b 7a 20snmx r-w.Kz..
00b0 ab de 64 1d 1b 86 da c3 c7 ef 9f 5e 7c ab bb d3 ..d..... ^|...
00c0 4f 29 04 90 9b 1f 14 87 54 1c a6 f0 bc f5 19 94 0)..... T.....

Internet Protocol Version 4 (ip), 20 bytes

```

> Frame 31: 1494 bytes on wire (11952 bits), 1494 bytes captured (11952 bits) on interface \Device\N
> Ethernet II, Src: Intel_60:e1:7c (5c:80:b6:60:e1:7c), Dst: TplinkTechno_63:ce:e8 (14:cc:20:63:ce:e
> Internet Protocol Version 4, Src: 192.168.4.104, Dst: 20.190.147.5
> Transmission Control Protocol, Src Port: 59704, Dst Port: 443, Seq: 3346, Ack: 1, Len: 1440

```

0020	93 05 e9 38 01 bb e1 6d 1d 7c cd ac 9a f8 50 10	...8...m... ...P...
0030	02 05 f2 af 00 00 86 75 76 53 98 cf 68 05 c2 9eu vS..h...
0040	49 96 89 6a 0b 46 32 95 3c 15 6b 37 c7 e5 85 82	I..j..F2..<..k7....
0050	c5 da be a3 42 b8 0e d4 92 50 ce 0d e4 af 82 aa	...B....P.....
0060	98 ad 16 32 4d 32 0c 06 08 a2 a8 af 39 15 f5 fa	...2M2... ..9....
0070	1b 1d 65 62 19 2c 9b 8f cc c3 34 a7 30 61 af 13	..eb,... ..4..0a...
0080	93 00 24 4f d2 ed f4 c3 0f 08 43 1a f5 72 a1 69	..\$0.....C...p..i
0090	5f 27 2c 51 64 f7 6c 40 df a7 d5 cc e6 86 53 a3	_',Qd..l@
00a0	91 c7 e7 f6 73 6e 6d 78 72 8a 77 c1 d3 4b 7a 20snmx r..w...Kz
00b0	ab de 64 1d 1b 86 da c3 c7 ef 9f 5e 7c ab bb d3	..d.....^
00c0	4f 29 04 90 9b 1f 14 87 54 1c a6 f0 bc f5 19 94	0).....T.....
00d0	34 c2 31 8d 4d 1a 19 94 36 d8 cc 1d 1a e9 96 db	4..1..M... ..6.....
00e0	65 81 cd ea c7 ea 86 16 3b 4e cf d1 f1 4d bd db	e.....;N...M...

Transmission Control Protocol (tcp), 20 bytes

Antet ethernet + antet IPv4 + antet TCP = 14 + 20 + 20 = 54 bytes