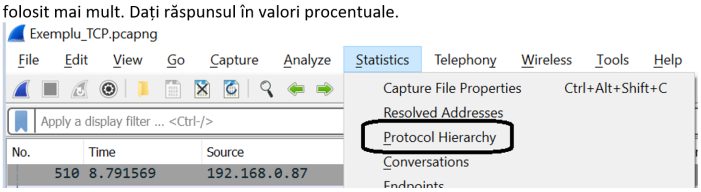
# Rețele de calculatoare

## Tema 3

**I. Statistici**

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



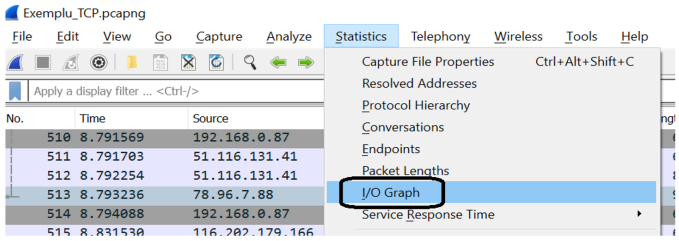

| Protocol | Percent Packets | Packets | Percent Bytes | Bytes | Bits/s | End Packets | End Bytes | End Bits/s | PDUs |
|---|---|---|---|---|---|---|---|---|---|
| Frame | 100.0 | 16914 | 100.0 | 16617050 | 3371 k | 0 | 0 | 0 | 16914 |
| Ethernet | 100.0 | 16914 | 1.4 | 236892 | 48 k | 0 | 0 | 0 | 16914 |
| Internet Protocol Version 6 | 0.1 | 14 | 0.0 | 560 | 113 | 0 | 0 | 0 | 14 |
| User Datagram Protocol | 0.1 | 14 | 0.0 | 112 | 22 | 0 | 0 | 0 | 14 |
| Internet Protocol Version 4 | 99.8 | 16875 | 2.0 | 337500 | 68 k | 0 | 0 | 0 | 16875 |
| User Datagram Protocol | 32.9 | 5569 | 0.3 | 44552 | 9039 | 0 | 0 | 0 | 5569 |
| Transmission Control Protocol | 66.8 | 11306 | 1.4 | 232336 | 47 k | 8874 | 183696 | 37 k | 11306 |
| Address Resolution Protocol | 0.1 | 25 | 0.0 | 700 | 142 | 25 | 700 | 142 | 25 |

TCP - este folosit mai mult → 66,8% (în IPV4)

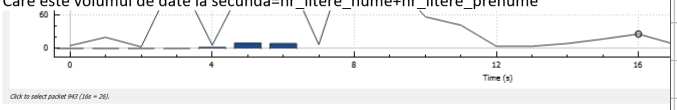
UDP → 0,1 + 32,9 ⟶ 33%

| Protocol | Percent Packets | Packets | Percent Bytes | Bytes | Bits/s | End Packets | End Bytes | End Bits/s | PDUs |
|---|---|---|---|---|---|---|---|---|---|
| Frame | 100.0 | 16914 | 100.0 | 16617050 | 3371 k | 0 | 0 | 0 | 16914 |
| Ethernet | 100.0 | 16914 | 1.4 | 236892 | 48 k | 0 | 0 | 0 | 16914 |
| Internet Protocol Version 6 | 0.1 | 14 | 0.0 | 560 | 113 | 0 | 0 | 0 | 14 |
| User Datagram Protocol | 0.1 | 14 | 0.0 | 112 | 22 | 0 | 0 | 0 | 14 |
| Simple Service Discovery Protocol | 0.1 | 12 | 0.0 | 5721 | 1160 | 12 | 5721 | 1160 | 12 |
| Multicast Domain Name System | 0.0 | 2 | 0.0 | 86 | 17 | 2 | 86 | 17 | 2 |
| Internet Protocol Version 4 | 99.8 | 16875 | 2.0 | 337500 | 68 k | 0 | 0 | 0 | 16875 |
| User Datagram Protocol | 32.9 | 5569 | 0.3 | 44552 | 9039 | 0 | 0 | 0 | 5569 |
| Simple Service Discovery Protocol | 0.2 | 30 | 0.1 | 13507 | 2740 | 30 | 13507 | 2740 | 30 |
| QUIC IETF | 31.8 | 5374 | 19.8 | 3287733 | 667 k | 5374 | 3268468 | 663 k | 5454 |
| Multicast Domain Name System | 0.1 | 14 | 0.0 | 614 | 124 | 14 | 614 | 124 | 14 |
| Domain Name System | 0.8 | 133 | 0.1 | 10047 | 2038 | 133 | 10047 | 2038 | 133 |
| Data | 0.1 | 18 | 0.0 | 3660 | 742 | 18 | 3660 | 742 | 18 |
| Transmission Control Protocol | 66.8 | 11306 | 1.4 | 232336 | 47 k | 8874 | 183696 | 37 k | 11306 |
| Transport Layer Security | 14.3 | 2413 | 74.6 | 12390121 | 2514 k | 2413 | 10457259 | 2121 k | 2573 |
| Hypertext Transfer Protocol | 0.0 | 8 | 0.0 | 3085 | 625 | 4 | 965 | 195 | 8 |
| Online Certificate Status Protocol | 0.0 | 4 | 0.0 | 3749 | 760 | 4 | 3749 | 760 | 4 |
| Data | 0.1 | 11 | 0.1 | 13402 | 2719 | 11 | 13402 | 2719 | 11 |
| Address Resolution Protocol | 0.1 | 25 | 0.0 | 700 | 142 | 25 | 700 | 142 | 25 |

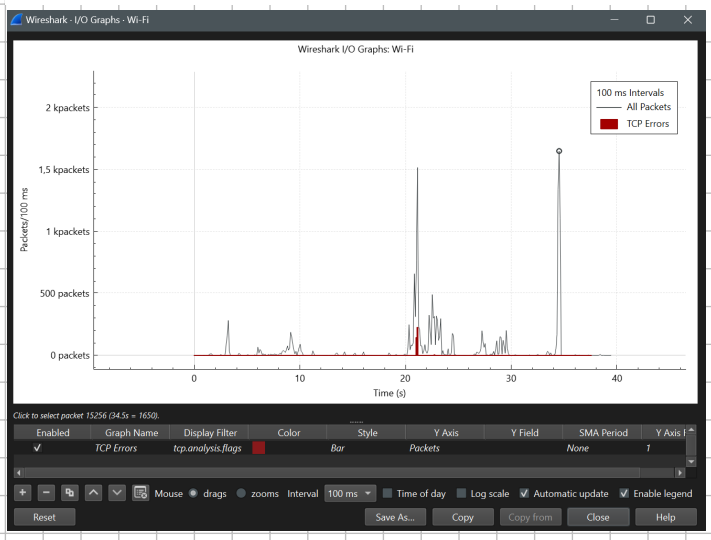
2. Utilizând utilitarul I/O Graph schimbați baza de timp la 1/10 dintr-o secundă și răspundeți la următoarele intrebări:




a. Care este volumul maxim de pachete/s și când îl găsiți?
b. Care este volumul de date la secundă=nr_litere_nume+nr_litere_prenume



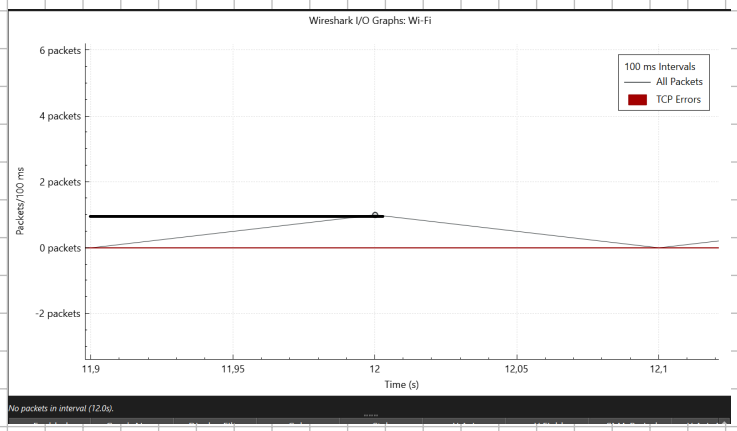



a) Volumul maxim de pachete se atinge la secunda 34,5 și anume 1650 pachete/s

b) CIOBANU BARIA

7 + 5 = 12

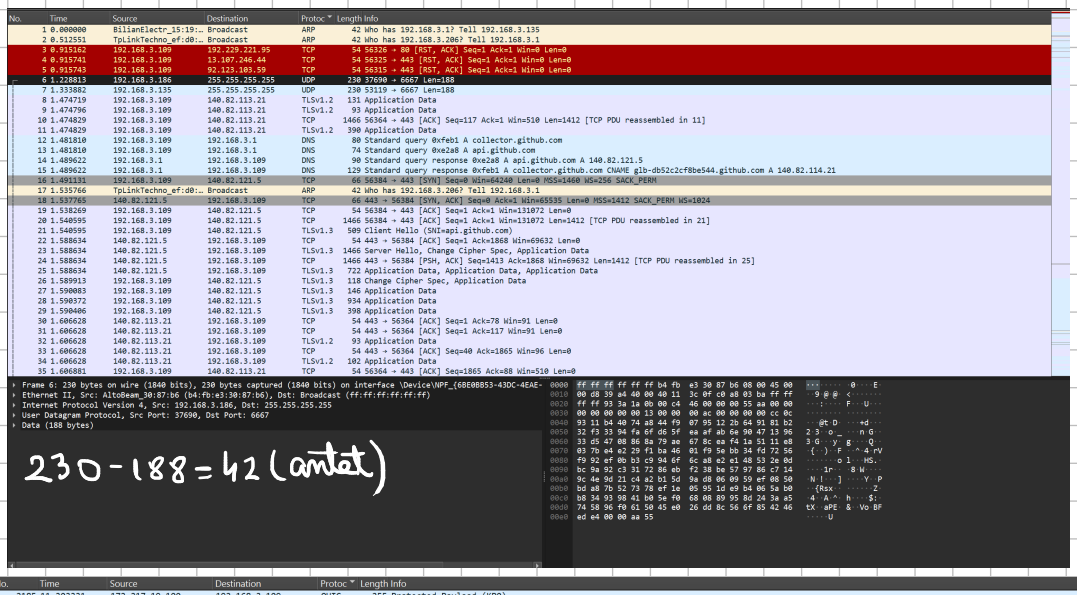


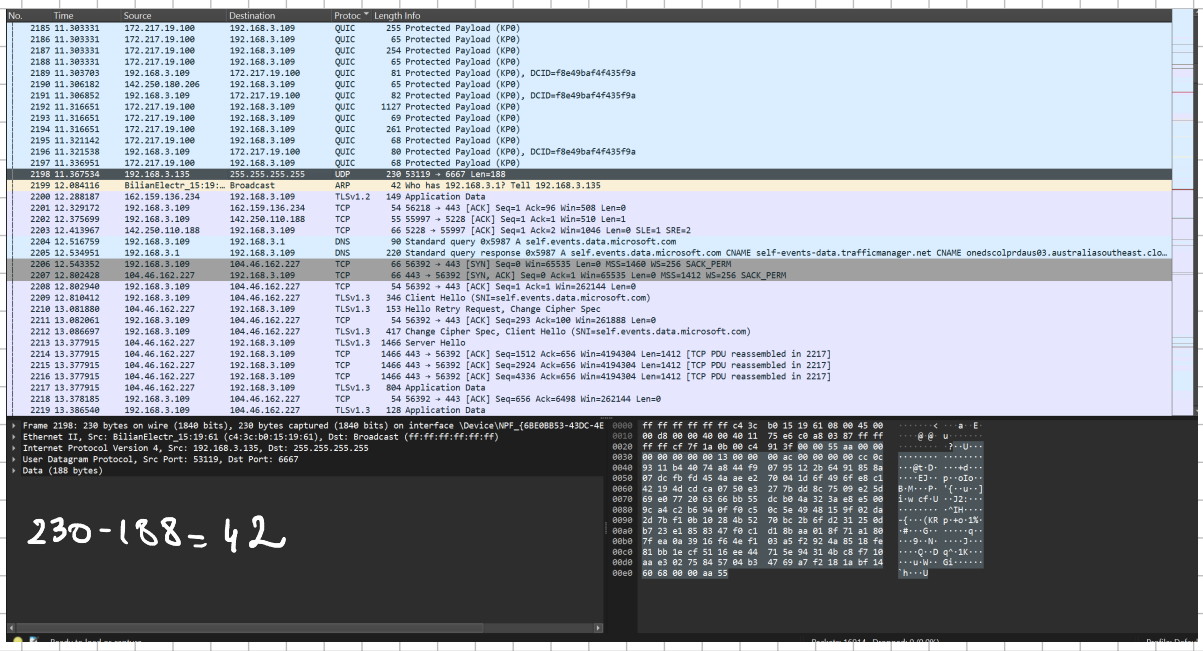

La secunda 12 -> aprox 1 pachet/s (din grafic)

## II. UDP

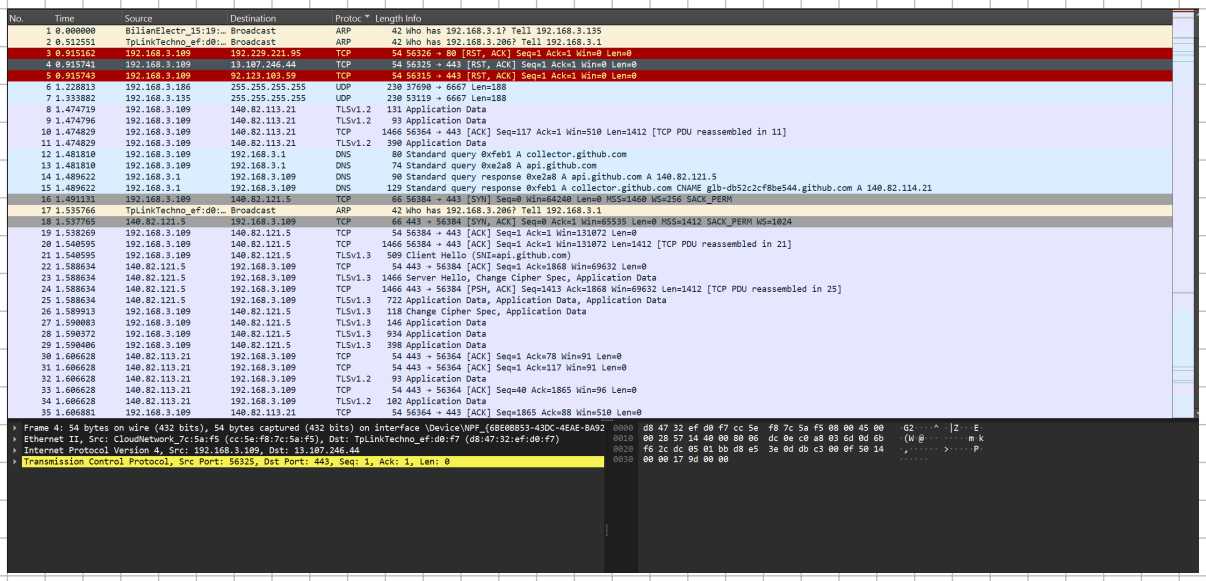
3. Utilizând o trasă de wireshark, care este dimensiunea antetului UDP, dacă luăm în considerare mai multe pachete.
4. Utilizând al 4-lea cadru (frame), care este portul sursă şi portul destinație al cadrului?
5. Pentru cel de-al 3-lea cadru DNS, care este suma, în octeți, a tuturor anetelor cadrului?

3.



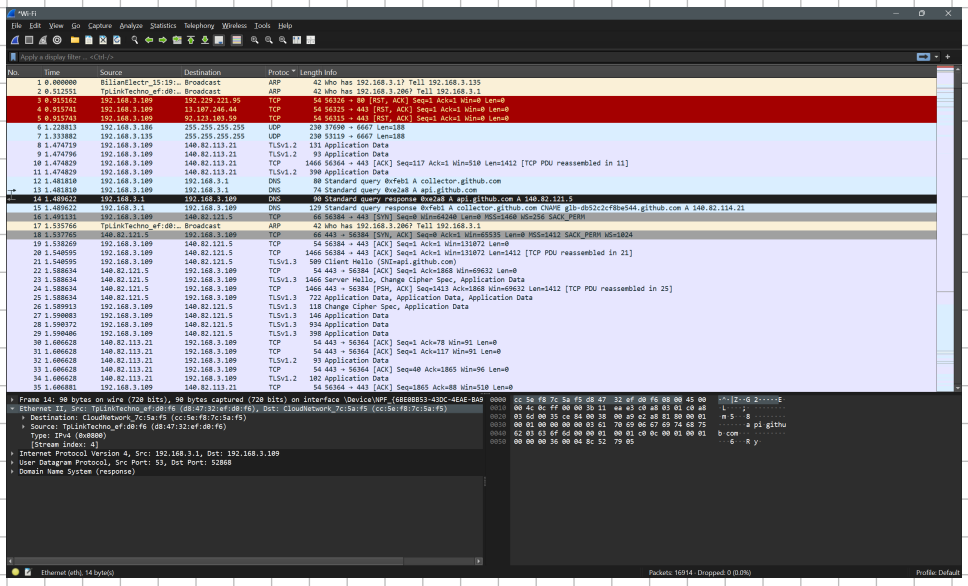
4)




port sursă : 56325

port destinație: 443

5.



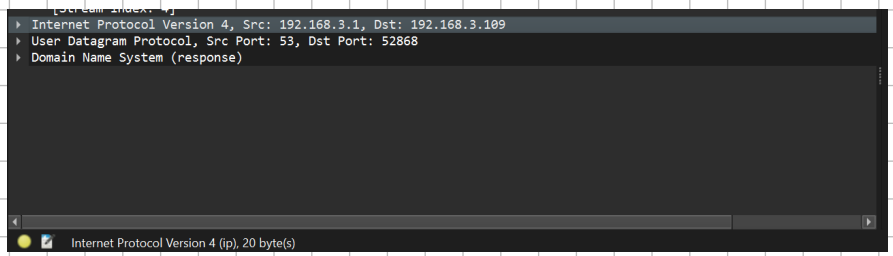

90 bytes on wire → date + antet

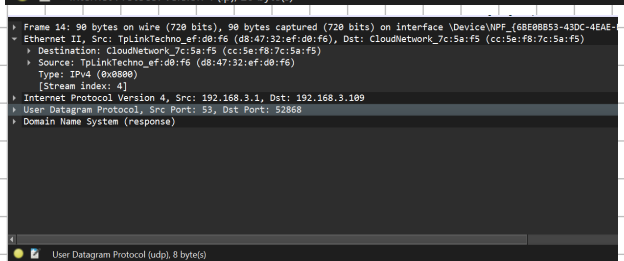
14 + 20 + 8 = 42

14 ↓ Ethernet bytes

20 → IPV4

8 → UDP



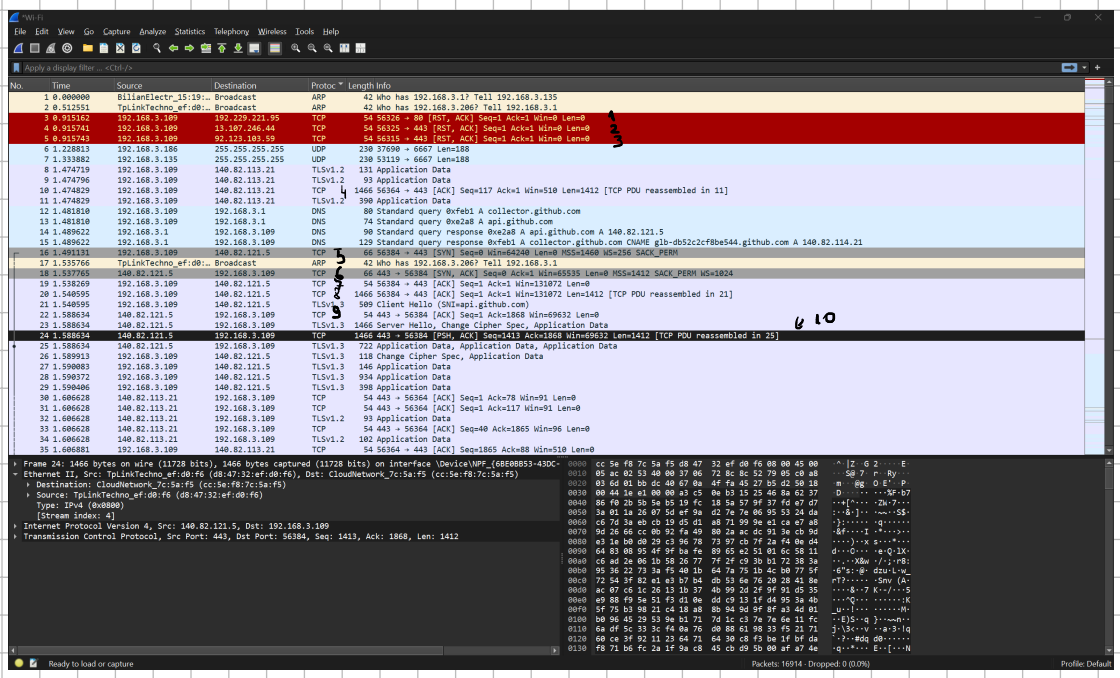

Verificare

90 − 20 − 14 − 8 = 48

## III. TCP

6. Care este socket-ul pentru sursă celui de-al 10-lea cadru TCP?
7. Care este diferența de timp între mesajele SYN și SYN-ACK ale unui singur transfer. Vă rugăm adresativă câmpului „Info” din fereastra wireshark pentru a identifica mesajele.
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).

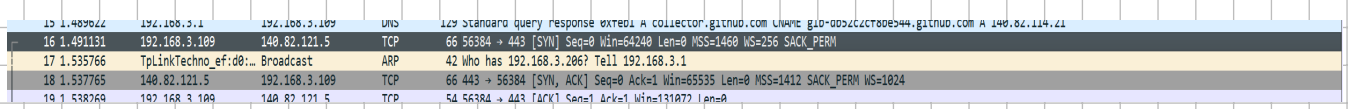
6.




Socket: IP + SRC PORT

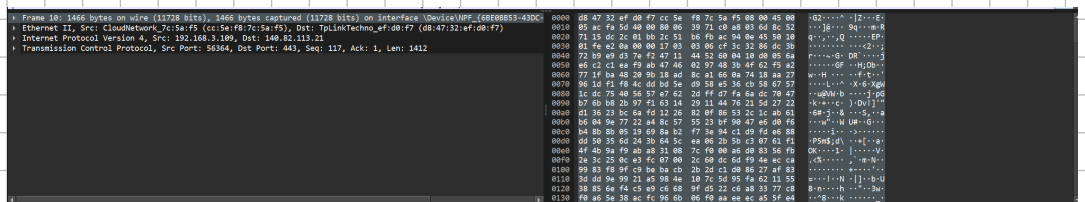
140.82.121.5 : 443

7.



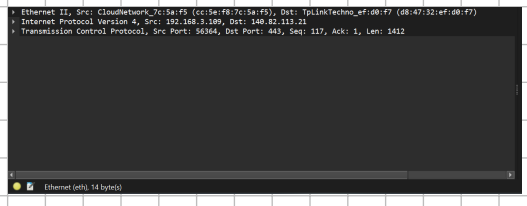

1.537765 - 1.491131 = 0,046634 secunde

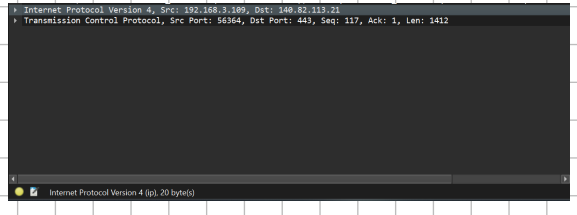
8.

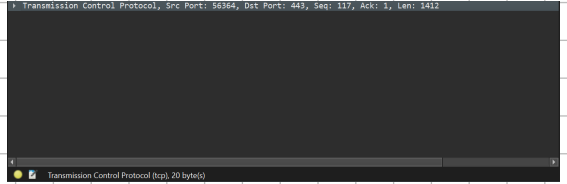


1. 1466 - 1412 = 54 bytes

2.







14+20+20 = 54 bytes