

Rețele de Calculatoare

Nivelurile unei Rețele si codurile canal

1. Folosiți Wireshark pentru a obține o trasă de minim 5000 linii (puteți folosi orice site doriți).

The image shows a Wireshark network traffic capture on interface en0. The packet list on the left shows a series of packets, including QUIC, DNS, TCP, and TLSv1. The packet details pane on the right shows the structure of a selected packet, including Ethernet II, Internet Protocol Version 6, User Datagram Protocol, and Data. The packet bytes pane on the right shows the raw data in hexadecimal and ASCII.

No.	Time	Source	Destination	Protocol	Length	Info
5097	7.870533	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	QUIC	93	Protected Payload (KP0), DCID=e97d4c8ada56bcd4
5098	7.875439	fe80::ce5:b06f:ac0...	fe80::101	DNS	107	Standard query 0x9d9c HTTPS ep2.adtrafficquality.google
5099	7.875703	fe80::ce5:b06f:ac0...	fe80::101	DNS	107	Standard query 0x6913 AAAA ep2.adtrafficquality.google
5100	7.875866	fe80::ce5:b06f:ac0...	fe80::101	DNS	107	Standard query 0xb669 A ep2.adtrafficquality.google
5101	7.891680	fe80::101	fe80::ce5:b06f:ac0...	DNS	167	Standard query response 0x9d9c HTTPS ep2.adtrafficquality.google SOA...
5102	7.897896	fe80::101	fe80::ce5:b06f:ac0...	DNS	135	Standard query response 0x6913 AAAA ep2.adtrafficquality.google AAAA...
5103	7.899369	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	98	56893 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1432 WS=64 TSval=6271410...
5104	7.901026	fe80::101	fe80::ce5:b06f:ac0...	DNS	123	Standard query response 0xb669 A ep2.adtrafficquality.google A 142.2...
5105	7.912157	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TCP	94	443 → 56893 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1392 SACK_PER...
5106	7.912516	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56893 → 443 [ACK] Seq=1 Ack=1 Win=131072 Len=0 TSval=62714120 TSecr=...
5107	7.912517	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TLSv1...	603	Client Hello (SNI=ep2.adtrafficquality.google)
5108	7.914882	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	QUIC	89	Protected Payload (KP0)
5109	7.925240	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TCP	86	443 → 56893 [ACK] Seq=1 Ack=518 Win=269568 Len=0 TSval=3683039138 TS...
5110	7.947388	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TLSv1...	1294	Server Hello, Change Cipher Spec
5111	7.947705	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56893 → 443 [ACK] Seq=518 Ack=1209 Win=129856 Len=0 TSval=62714155 T...
5112	7.947984	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TCP	1294	443 → 56893 [PSH, ACK] Seq=1209 Ack=518 Win=269568 Len=1208 TSval=36...
5113	7.948059	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56893 → 443 [ACK] Seq=518 Ack=2417 Win=129856 Len=0 TSval=62714155 T...
5114	7.948305	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TCP	1294	443 → 56893 [ACK] Seq=2417 Ack=518 Win=269568 Len=1208 TSval=3683039...
5115	7.948305	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TLSv1...	605	Application Data
5116	7.948620	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56893 → 443 [ACK] Seq=518 Ack=4144 Win=129344 Len=0 TSval=62714155 T...
5117	7.952541	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TLSv1...	150	Change Cipher Spec, Application Data
5118	7.953831	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TLSv1...	467	Application Data
5119	7.956743	2a09:bac0:1008:100...	2a02:2f09:9714:e50...	UDP	1289	443 → 57822 Len=1227
5120	7.957116	2a02:2f09:9714:e50...	2a09:bac0:1008:100...	UDP	141	57822 → 443 Len=79
5121	7.957314	2a02:2f09:9714:e50...	2a09:bac0:1008:100...	UDP	134	57822 → 443 Len=72
5122	7.958293	2a09:bac0:1008:100...	2a02:2f09:9714:e50...	UDP	1293	443 → 57822 Len=1231

> Frame 1: 103 bytes on wire (824 bits), 103 bytes captured (824 bits) on interface en0, id 0
> Ethernet II, Src: 0a:3b:1a:f0:f2:84 (0a:3b:1a:f0:f2:84), Dst: HuaweiTechno_81:8e:03 (f0:9b:b8:81:8e:03)
> Internet Protocol Version 6, Src: 2a02:2f09:9714:e500:a875:1dca:4b32:da59, Dst: 2a02:26f7:2e:4:ace0:c206::
> User Datagram Protocol, Src Port: 50061, Dst Port: 443
> Data (41 bytes)

0000 f0 9b b8 81 8e 03 0a 3b 1a f0 f2 84 8
0010 eb 70 00 31 11 40 2a 02 2f 09 97 14 e
0020 1d ca 4b 32 da 59 2a 02 26 f7 00 2a 0
0030 c2 06 00 00 00 00 c3 8d 01 bb 00 31 d
0040 59 f7 90 7b 21 d8 cb 19 dd de c2 c8 0
0050 36 5e 7d 3c 71 8c e3 89 16 98 dc 28 2
0060 0a cb f9 b5 61 57 4f

2. Identificați minim 5 protocoale transmise în trasa voastră.

The image shows a Wireshark network traffic capture on interface en0. The packet list on the left shows a series of packets, including TCP, TLSv1, and HTTP. The packet details pane on the right shows the structure of a selected packet, including Ethernet II, Internet Protocol Version 6, User Datagram Protocol, and Data. The packet bytes pane on the right shows the raw data in hexadecimal and ASCII.

No.	Time	Source	Destination	Protocol	Length	Info
1450	5.787951	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56889 → 443 [ACK] Seq=518 Ack=3625 Win=131072 Len=0 TSval=2744073396 TSecr=...
1451	5.788047	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56889 → 443 [ACK] Seq=518 Ack=6041 Win=128640 Len=0 TSval=2744073396 TSecr=...
1452	5.788085	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TLSv1...	629	Application Data
1453	5.788393	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56889 → 443 [ACK] Seq=518 Ack=6584 Win=130496 Len=0 TSval=2744073396 TSecr=...
1454	5.792351	192.124.249.41	192.168.100.137	TCP	74	80 → 50954 [SYN, ACK] Seq=0 Ack=1 Win=21720 Len=0 MSS=1412 SACK_PERM TSva...
1455	5.792712	192.168.100.137	192.124.249.41	TCP	66	50954 → 80 [ACK] Seq=1 Ack=1 Win=131584 Len=0 TSval=568295787 TSecr=31157...
1456	5.793004	192.168.100.137	192.124.249.41	HTTP	403	GET /MEAwPjA8M0owODAHBgUrdgMCgQUHsvjgZLlx%2Fd36EVI%2BGu5QK%2BKXsEFdqah...
1457	5.793154	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TLSv1...	150	Change Cipher Spec, Application Data
1458	5.795661	192.124.249.41	192.168.100.137	TCP	74	80 → 50953 [SYN, ACK] Seq=0 Ack=1 Win=21720 Len=0 MSS=1412 SACK_PERM TSva...
1459	5.795910	192.168.100.137	192.124.249.41	TCP	66	50953 → 80 [ACK] Seq=1 Ack=1 Win=131584 Len=0 TSval=3334318079 TSecr=3115...
1460	5.796103	192.168.100.137	192.124.249.41	HTTP	413	GET /MEgWjRjBEMeIwQDAHBgUrdgMCgQUHsvjgZLlx%2Fd36EVI%2BGu5QK%2BKXsEFdqah...
1461	5.801990	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TLSv1...	557	Application Data
1462	5.804402	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TLSv1...	700	Application Data, Application Data
1463	5.804566	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56889 → 443 [ACK] Seq=1053 Ack=7198 Win=130432 Len=0 TSval=2744073413 TSecr=...
1464	5.804614	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TLSv1...	117	Application Data
1465	5.813055	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TLSv1...	117	Application Data
1466	5.813156	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	TCP	86	56889 → 443 [ACK] Seq=1084 Ack=7229 Win=131008 Len=0 TSval=2744073421 TSecr=...
1467	5.815488	192.124.249.41	192.168.100.137	TCP	66	80 → 50954 [ACK] Seq=1 Ack=338 Win=21504 Len=0 TSval=3115736239 TSecr=568...
1468	5.815687	192.124.249.41	192.168.100.137	TCP	1466	80 → 50954 [ACK] Seq=1 Ack=338 Win=21504 Len=0 TSval=3115736239 TSecr=568...
1469	5.815688	192.124.249.41	192.168.100.137	OCSP	1257	Response
1470	5.815823	192.168.100.137	192.124.249.41	TCP	66	50954 → 80 [ACK] Seq=338 Ack=2592 Win=128960 Len=0 TSval=568295780 TSecr=...
1471	5.819842	2a00:1450:400d:80e...	2a02:2f09:9714:e50...	TCP	86	443 → 56889 [ACK] Seq=7229 Ack=1084 Win=269312 Len=0 TSval=1730936232 TSecr=...
1472	5.820477	192.124.249.41	192.168.100.137	TCP	66	80 → 50953 [ACK] Seq=1 Ack=348 Win=21504 Len=0 TSval=3115736242 TSecr=333...
1473	5.820566	192.124.249.41	192.168.100.137	TCP	1466	80 → 50953 [ACK] Seq=1 Ack=348 Win=21504 Len=1400 TSval=3115736242 TSecr=568...
1474	5.820644	192.168.100.137	192.124.249.41	TCP	66	50953 → 80 [ACK] Seq=348 Ack=1401 Win=130176 Len=0 TSval=3334318104 TSecr=...
1475	5.821096	192.124.249.41	192.168.100.137	OCSP	1385	Response
1476	5.821178	192.168.100.137	192.124.249.41	TCP	66	50953 → 80 [ACK] Seq=348 Ack=2640 Win=129792 Len=0 TSval=3334318104 TSecr=...

No.	Time	Source	Destination	Protocol	Length	Info
1584	6.033275	192.168.100.137	81.196.8.182	TCP	66	50952 → 443 [ACK] Seq=2442 Ack=61937 Win=131072 Len=0 TSval=2517423017 TS...
1585	6.033431	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=63337 Ack=2442 Win=64128 Len=1400 TSval=1949470264 ...
1586	6.033431	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [PSH, ACK] Seq=64737 Ack=2442 Win=64128 Len=1400 TSval=194947...
1587	6.033500	192.168.100.137	81.196.8.182	TCP	66	50952 → 443 [ACK] Seq=2442 Ack=66137 Win=131072 Len=0 TSval=2517423017 TS...
1588	6.033542	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=66137 Ack=2442 Win=64128 Len=1400 TSval=1949470264 ...
1589	6.033543	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=67537 Ack=2442 Win=64128 Len=1400 TSval=1949470264 ...
1590	6.033604	192.168.100.137	81.196.8.182	TCP	66	50952 → 443 [ACK] Seq=2442 Ack=68937 Win=131072 Len=0 TSval=2517423017 TS...
1591	6.034547	81.196.8.182	192.168.100.137	TLSv1...	1289	Application Data
1592	6.034548	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=70160 Ack=2442 Win=64128 Len=1400 TSval=1949470264 ...
1593	6.034549	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=71560 Ack=2442 Win=64128 Len=1400 TSval=1949470264 ...
1594	6.034682	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [PSH, ACK] Seq=72960 Ack=2442 Win=64128 Len=1400 TSval=194947...
1595	6.034683	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=74360 Ack=2442 Win=64128 Len=1400 TSval=1949470264 ...
1596	6.034683	fe80::ce5:b06f:ac0...	fe80::ce5:b06f:ac0...	DNS	165	Standard query response 0x9025 HTTPS www.googletagservices.com SOA ns1.go...
1597	6.034997	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	QUIC	618	Protected Payload (KP0), DCID=e42c85d06921304e
1598	6.035205	192.168.100.137	81.196.8.182	TCP	66	50952 → 443 [ACK] Seq=2442 Ack=75760 Win=131072 Len=0 TSval=2517423019 TS...
1599	6.038463	fe80::ce5:b06f:ac0...	fe80::ce5:b06f:ac0...	DNS	133	Standard query response 0x6673 AAAA www.googletagservices.com AAAA 2a00:1...
1600	6.040895	2a02:2f09:9714:e50...	2a09:bac0:1008:100...	UDP	661	57822 → 443 Len=599
1601	6.042385	192.168.100.137	81.196.8.182	TLSv1...	217	Application Data
1602	6.044115	192.168.100.137	81.196.8.182	TLSv1...	203	Application Data
1603	6.045514	192.168.100.137	81.196.8.182	TLSv1...	198	Application Data
1604	6.047237	2a02:2f09:9714:e50...	2a00:1450:400d:80e...	QUIC	532	Protected Payload (KP0), DCID=e42c85d06921304e
1605	6.050246	fe80::ce5:b06f:ac0...	fe80::ce5:b06f:ac0...	DNS	179	Standard query response 0x9960 HTTPS cookie-cdn.cookiepro.com SOA bob.ns...
1606	6.050247	fe80::ce5:b06f:ac0...	fe80::ce5:b06f:ac0...	DNS	121	Standard query response 0xc687 A www.googletagservices.com A 142.250.201...
1607	6.050247	192.168.100.137	81.196.8.182	TCP	1466	443 → 50952 [ACK] Seq=75760 Ack=2442 Win=64128 Len=1400 TSval=1949470287 ...
1608	6.050340	192.168.100.137	81.196.8.182	TCP	66	50952 → 443 [ACK] Seq=2862 Ack=77160 Win=146432 Len=0 TSval=2517423035 TS...
1609	6.050517	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [ACK] Seq=77160 Ack=2442 Win=64128 Len=1400 TSval=1949470287 ...
1610	6.050517	81.196.8.182	192.168.100.137	TCP	1466	443 → 50952 [PSH, ACK] Seq=78560 Ack=2442 Win=64128 Len=1400 TSval=194947...

Protocoloalele identificate din cele doua poze atasate mai sus sunt: TCP, TLSv1.2, HTTP, OSCP, DNS, QUIC, UDP.

3. Care este timpul de achiziție pentru cadrul cu numărul
(numarul_de_litere_din_nume)*numarul_grupeii*numarul_subgrupeii*10.

Nume:Seres->5 litere

Grupa:3

Subgrupa:1

Numarului cadrului: $5 \cdot 3 \cdot 1 \cdot 10 = 150$

The image shows a Wireshark packet capture analysis of a network traffic. The packet list on the left shows a series of QUIC packets (139-165) with Protected Payload (KP0). The packet details for packet 150 are expanded, showing the QUIC IETF header and payload structure. The header includes the Source and Destination IP addresses (2a02:2f09:9714:e50... and 2a00:1450:400d:80e...) and the Source and Destination ports (52364 and 443). The payload is a Protected Payload (KP0) with a length of 93 bytes.

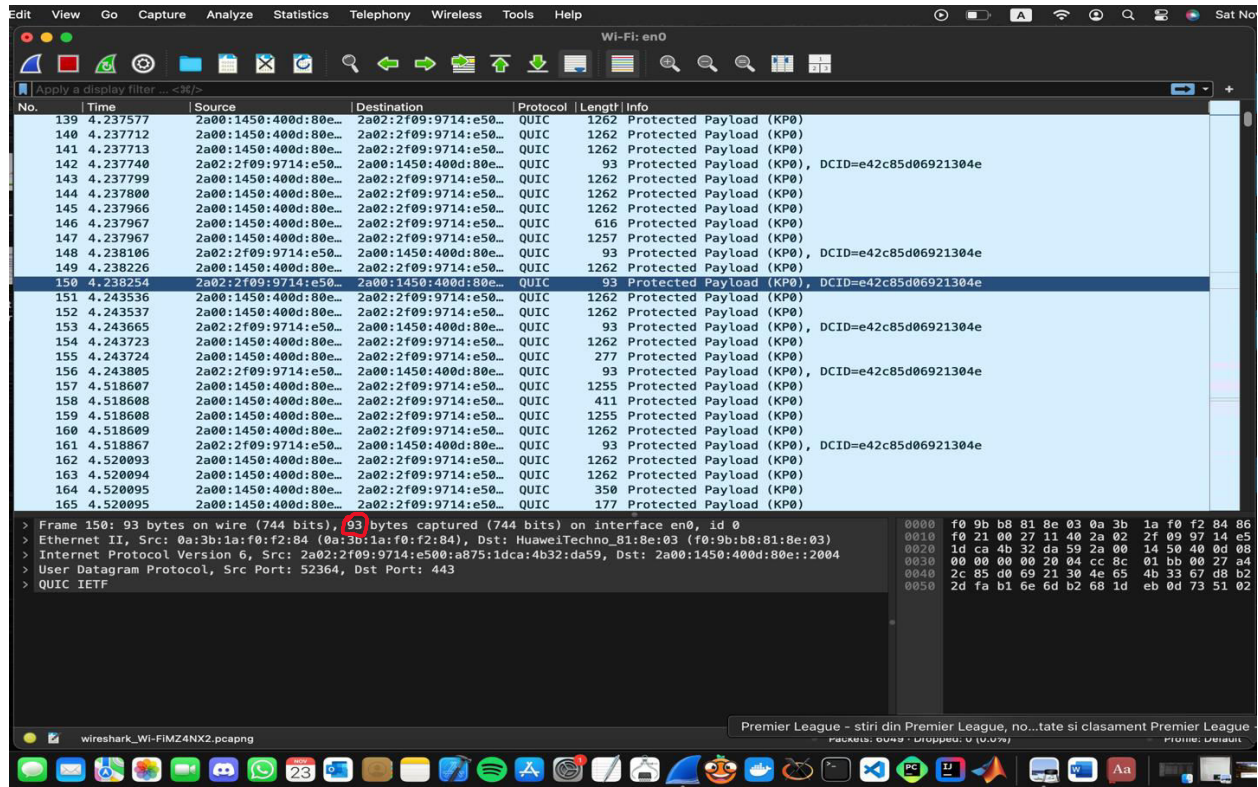
Timpul de achizitie este egal cu: 4.238254

4. Pentru cadrul cu numărul

(numarul_de_litere_din_prenume)*numarul_grupe_i*numarul_subgrupe_i*10

Spuneți care este volumul de date captat de wireshark.

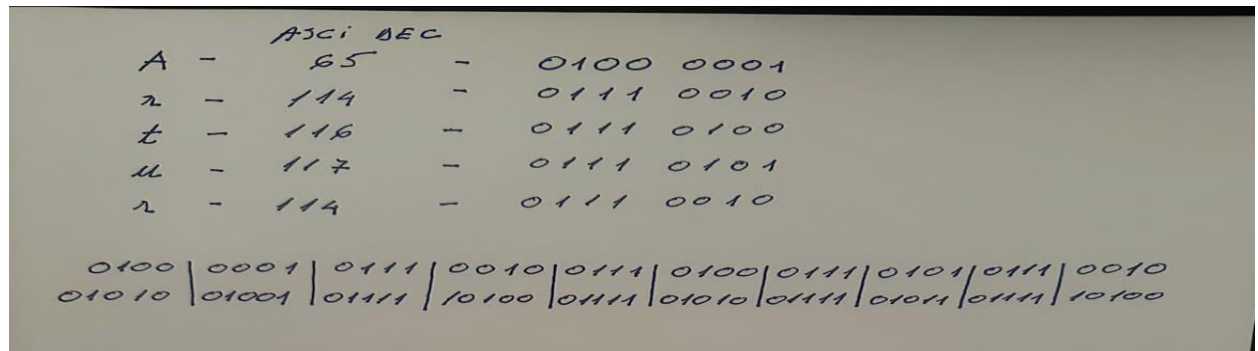
Numarul cadrului:150



Volumul de date capturat de wireshark pentru cadrul cu numarul 150 este: 93 bytes.

5. Converteți 4b/5b prenumele vostru (cel de-al 2-lea în caz că aveți mai multe) folosindu-vă de convertorul ASCII-to-Binary din laborator.

Prenume:Artur-01000001 01110010 01110100 01110101 01110010



Dupa convertire:Artur-0101001001 01111101000 0111101010 0111101011 0111110100

6. Desenați formele de undă pentru codurile RZ, NRZ-I (Inverted) și Manchester pentru primii 10 biți rezultați de la punctul 5.

