

בחרנו להציג פקטות שקשורות לשליחת השאילתה (פקודה) הבאה מהלקוח:

is_prime: 13

No.	Time	Source	Destination	Protocol	Length	Info
50	347.769972	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=35 Ack=56 Win=2619648 Len=4
51	347.769992	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=39 Win=2619648 Len=0
52	347.770008	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=39 Ack=56 Win=2619648 Len=4
53	347.770014	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=43 Win=2619648 Len=0
54	347.770022	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=43 Ack=56 Win=2619648 Len=4
55	347.770028	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=47 Win=2619648 Len=0
56	347.770036	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=47 Ack=56 Win=2619648 Len=4
57	347.770041	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=51 Win=2619648 Len=0
58	347.770140	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=56 Ack=51 Win=2619648 Len=4
59	347.770153	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=60 Win=2619648 Len=0
60	347.770172	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=60 Ack=51 Win=2619648 Len=4
61	347.770178	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=64 Win=2619648 Len=0
62	347.770191	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=64 Ack=51 Win=2619648 Len=4
63	347.770199	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=68 Win=2619648 Len=0
64	347.770211	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=68 Ack=51 Win=2619648 Len=4
65	347.770217	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=72 Win=2619648 Len=0
66	347.770230	127.0.0.1	127.0.0.1	TCP	46	1337 → 15677 [PSH, ACK] Seq=72 Ack=51 Win=2619648 Len=2
67	347.770235	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=74 Win=2619648 Len=0

Frame 50: 48 bytes on wire (384 bits), 48 bytes captured (384 bits) on interface \Device\NPF_{...} 0000 02 00 00 00 45 00 00 2c 27 45 40 00 80 06 00 00 ... E... 'E@...
Null/Loopback 0010 7f 00 00 01 7f 00 00 01 3d 3d 05 39 a3 15 35 d1 ... *... == 9 5
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1 0020 fd ec 3e 4a 50 18 27 f9 32 2d 00 00 00 00 0c ... <P>... 2-...
Transmission Control Protocol, Src Port: 15677, Dst Port: 1337, Seq: 35, Ack: 56, Len: 4
Data (4 bytes)

בתמונה הראשונה רואים איך שהלקוח שולח בפקטה לשרת את גודל הפקודה, כפי שנדרש בפרוטוקול שהגדרנו. הגודל הינו INT, שמויצג ע"י 4 בתים, במקרה הזה בעל ערך 12 - כאורך תווים בפקודה.

No.	Time	Source	Destination	Protocol	Length	Info
50	347.769972	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=35 Ack=56 Win=2619648 Len=4
51	347.769992	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=39 Win=2619648 Len=0
52	347.770008	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=39 Ack=56 Win=2619648 Len=4
53	347.770014	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=43 Win=2619648 Len=0
54	347.770022	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=43 Ack=56 Win=2619648 Len=4
55	347.770028	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=47 Win=2619648 Len=0
56	347.770036	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=47 Ack=56 Win=2619648 Len=4
57	347.770041	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=51 Win=2619648 Len=0
58	347.770140	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=56 Ack=51 Win=2619648 Len=4
59	347.770153	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=60 Win=2619648 Len=0
60	347.770172	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=60 Ack=51 Win=2619648 Len=4
61	347.770178	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=64 Win=2619648 Len=0
62	347.770191	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=64 Ack=51 Win=2619648 Len=4
63	347.770199	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=68 Win=2619648 Len=0
64	347.770211	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=68 Ack=51 Win=2619648 Len=4
65	347.770217	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=72 Win=2619648 Len=0
66	347.770230	127.0.0.1	127.0.0.1	TCP	46	1337 → 15677 [PSH, ACK] Seq=72 Ack=51 Win=2619648 Len=2
67	347.770235	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=74 Win=2619648 Len=0

Frame 52: 48 bytes on wire (384 bits), 48 bytes captured (384 bits) on interface \Device\NPF_{...} 0000 02 00 00 00 45 00 00 2c 27 47 40 00 80 06 00 00 ... E... 'G@...
Null/Loopback 0010 7f 00 00 01 7f 00 00 01 3d 3d 05 39 a3 15 35 d5 == 9 5
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1 0020 fd ec 3e 4a 50 18 27 f9 69 51 00 00 69 73 5f 70 ... <P>... iQ 5p
Transmission Control Protocol, Src Port: 15677, Dst Port: 1337, Seq: 39, Ack: 56, Len: 4
Data (4 bytes)

No.	Time	Source	Destination	Protocol	Length	Info
52	347.770008	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=39 Ack=56 Win=2619648 Len=4
53	347.770014	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=43 Win=2619648 Len=0
54	347.770022	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=43 Ack=56 Win=2619648 Len=4
55	347.770028	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=47 Win=2619648 Len=0
56	347.770036	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=47 Ack=56 Win=2619648 Len=4
57	347.770041	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=56 Ack=51 Win=2619648 Len=0
58	347.770140	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=56 Ack=51 Win=2619648 Len=4
59	347.770153	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=60 Win=2619648 Len=0
60	347.770172	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=60 Ack=51 Win=2619648 Len=4
61	347.770178	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=64 Win=2619648 Len=0
62	347.770191	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=64 Ack=51 Win=2619648 Len=4
63	347.770199	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=68 Win=2619648 Len=0
64	347.770211	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=68 Ack=51 Win=2619648 Len=4
65	347.770217	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=72 Win=2619648 Len=0
66	347.770230	127.0.0.1	127.0.0.1	TCP	46	1337 → 15677 [PSH, ACK] Seq=72 Ack=51 Win=2619648 Len=2
67	347.770235	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=51 Ack=74 Win=2619648 Len=0
68	699.121241	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=51 Ack=74 Win=2619648 Len=4
69	699.121260	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=74 Ack=55 Win=2619648 Len=0
70	699.121277	127.0.0.1	127.0.0.1	TCP	48	15677 → 1337 [PSH, ACK] Seq=55 Ack=74 Win=2619648 Len=4
71	699.121282	127.0.0.1	127.0.0.1	TCP	44	1337 → 15677 [ACK] Seq=74 Ack=59 Win=2619648 Len=0
72	699.121367	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=74 Ack=59 Win=2619648 Len=4
73	699.121379	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=59 Ack=78 Win=2619648 Len=0
74	699.121399	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=78 Ack=59 Win=2619648 Len=4
75	699.121405	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=59 Ack=82 Win=2619648 Len=0
76	699.121419	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=82 Ack=59 Win=2619648 Len=4
77	699.121426	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=59 Ack=86 Win=2619648 Len=0
78	699.121439	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=86 Ack=59 Win=2619648 Len=4
79	699.121445	127.0.0.1	127.0.0.1	TCP	44	15677 → 1337 [ACK] Seq=59 Ack=90 Win=2619648 Len=0
80	699.121458	127.0.0.1	127.0.0.1	TCP	48	1337 → 15677 [PSH, ACK] Seq=90 Ack=59 Win=2619648 Len=4

Frame 56: 48 bytes on wire (384 bits), 48 bytes captured (384 bits) on interface \Device\NPF_{...} 0000 02 00 00 00 45 00 00 2c 27 4b 40 00 80 06 00 00 ... E... 'K@...
Null/Loopback 0010 7f 00 00 01 7f 00 00 01 3d 3d 05 39 a3 15 35 dd == 9 5
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1 0020 fd ec 3e 4a 50 18 27 f9 c6 d9 00 00 3a 20 31 33 ... <P>... : 13
Transmission Control Protocol, Src Port: 15677, Dst Port: 1337, Seq: 47, Ack: 56, Len: 4
Data (4 bytes)

אחרי שהפקטה ACK מתקבלת מהשרת כי קיבל את אורך ההודעה בהצלחה, רואים איך שהלקוח שולח את הפקודה. השליחה מתבצעת בכמה פקטות - 52, 54, 56, והמידע בכל אחת הוא בגודל 4 בתים. עבור כל אחת מהן בנפרד, מכיוון שפרוטוקול TCP, אנחנו מקבלים מהשרת פקטה ACK כדי להבטיח תקשורת מוצלחת ועקבית.