



Oh, And One More Thing... (OK, Two Things)



measurement and architecture for a middleboxed internet

PLUS Update



- Performance improvements in plus-go since last meeting
- No measurable overhead with guic w/PLUS vs. w/o PLUS
- $< 7\%$ overhead when using raw data transfer
- Interop testing with fd.io implementation underway
- Experiment planning with fd.io soon



Anzeigefilter anwenden ... <Ctrl-/>

Ausdruck...

No.	Time	Source	Src Port	Destination	Dst Port	Protocol	Length	Info
1	0.000000000	127.0.0.1	10000	127.0.0.1	9999	PLUS	66	CAT: 11396144077444291911, PSN: 840861141, PSE: 0
2	0.000223732	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247575, PSE: 840861141
3	0.000846894	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861142, PSE: 596247575
4	0.000926983	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247576, PSE: 840861142
5	0.001438818	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861143, PSE: 596247576
6	0.001483236	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247577, PSE: 840861143
7	0.001955320	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861144, PSE: 596247577
8	0.002030874	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247578, PSE: 840861144
9	0.002544896	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861145, PSE: 596247578
10	0.002587682	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247579, PSE: 840861145

▸ Frame 1: 66 bytes on wire (528 bits), 66 bytes captured (528 bits) on interface 0

▸ Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)

▸ Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1

▸ User Datagram Protocol, Src Port: 10000, Dst Port: 9999

▸ Path Layer UDP Substrate

1101 1000 0000 0000 0111 1111 1111 = Magic ID: 0xd8007ff

▸ 0000 = Flags: 0x0

0... = LoLa Flag: False

.0.. = RoI Flag: False

..0. = Stop Flag: False

...0 = Extended Header Flag: False

CAT: 11396144077444291911

PSN: 840861141

PSE: 0

Data: 5e5d5c53

0000 00 00 00 00 00 00 00 00 00 00 00 08 00 45 00E.

0010 00 34 23 65 40 00 40 11 19 52 7f 00 00 01 7f 00 .4#e@.@. .R.....

0020 00 01 27 10 27 0f 00 20 fe 33 d8 00 7f f0 9e 27 ..'.'.. .3.....'

0030 3c a8 b9 3d 1d 47 32 1e 85 d5 00 00 00 00 5e 5d <..=.G2.^]

0040 5c 53 \S

Ethernet (eth), 14 Bytes

Pakete: 10 · Angezeigt: 10 (100.0%)

Profil:Default





plus										Ausdruck...	
No.	Time	Source	Src Port	Destination	Dst Port	Protocol	Length	Info			
10.000000000	127.0.0.1	10000	127.0.0.1	9999	PLUS	66	CAT: 11396144077444291911, PSN: 840861141, PSE: 0				
20.000223732	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247575, PSE: 840861141				
30.000846894	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861142, PSE: 596247575				
40.000926983	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247576, PSE: 840861142				
50.001438818	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861143, PSE: 596247576				
60.001483236	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247577, PSE: 840861143				
70.001955320	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861144, PSE: 596247577				
80.002030874	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247578, PSE: 840861144				
90.002544896	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 11396144077444291911, PSN: 840861145, PSE: 596247578				
100.002587682	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 11396144077444291911, PSN: 596247579, PSE: 840861145				
Frame 3: 72 bytes on wire (576 bits), 72 bytes captured (576 bits) on interface 0											
Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)											
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1											
User Datagram Protocol, Src Port: 10000, Dst Port: 9999											
Path Layer UDP Substrate											
1101 1000 0000 0000 0111 1111 1111 = Magic ID: 0xd8007ff											
.... 0001 = Flags: 0x1											
0... = LoLa Flag: False											
.0.. = RoI Flag: False											
..0. = Stop Flag: False											
...1 = Extended Header Flag: True											
CAT: 11396144077444291911											
PSN: 840861142											
PSE: 596247575											
PCF Type: 1											
0001 00.. = PCF Length: 4											
.... ..00 = PCF Integrity Indication: PCF value not integrity protected (0x0)											
PCF Value: cafebabe											
Data: 5e5d5c53											
0000	00 00 00 00 00 00 00 00	00 00 00 00 08 00 45 00E.								
0010	00 3a 23 67 40 00 40 11	19 4a 7f 00 00 01 7f 00	.:#g@.@. .J.....								
0020	00 01 27 10 27 0f 00 26	fe 39 d8 00 7f f1 9e 27	..'.& .9.....								
0030	3c a8 b9 3d 1d 47 32 1e	85 d6 23 8a 04 17 01 10	<..=.G2. ..#.....								
0040	ca fe ba be 5e 5d 5c 53	^]\S								
Path Layer UDP Substrate (plus), 30 Bytes											
Pakete: 26 · Angezeigt: 10 (38.5%) · Verworfen: 0 (0.0%) · Profil:Default											



<Name>: <Title>



plus

No.	Time	Source	Src Port	Destination	Dst Port	Protocol	Length	Info
78.294272911	127.0.0.1	10000	127.0.0.1	9999	PLUS	66	CAT: 2053721869143190625, PSN: 1673425991, PSE: 0	
88.314526363	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 2053721869143190625, PSN: 4197785269, PSE: 1673425991	
98.314632458	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 2053721869143190625, PSN: 1673425992, PSE: 4197785269	
108.315100736	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 2053721869143190625, PSN: 4197785270, PSE: 1673425992	
118.315169843	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 2053721869143190625, PSN: 1673425993, PSE: 4197785270	
128.315862691	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 2053721869143190625, PSN: 4197785271, PSE: 1673425993	
138.315997843	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 2053721869143190625, PSN: 1673425994, PSE: 4197785271	
148.317102529	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 2053721869143190625, PSN: 4197785272, PSE: 1673425994	
158.317176426	127.0.0.1	10000	127.0.0.1	9999	PLUS	72	CAT: 2053721869143190625, PSN: 1673425995, PSE: 4197785272	
168.317855189	127.0.0.1	9999	127.0.0.1	10000	PLUS	66	CAT: 2053721869143190625, PSN: 4197785273, PSE: 1673425995	

• Frame 9: 72 bytes on wire (576 bits), 72 bytes captured (576 bits) on interface 0

• Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)

• Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1

• User Datagram Protocol, Src Port: 10000, Dst Port: 9999

• Path Layer UDP Substrate

1101 1000 0000 0000 0111 1111 1111 = Magic ID: 0xd8007ff

• 0001 = Flags: 0x1

0.. = LoLa Flag: False

.0.. = RoI Flag: False

..0. = Stop Flag: False

...1 = Extended Header Flag: True

CAT: 2053721869143190625

PSN: 1673425992

PSE: 4197785269

PCF Type: 1

0001 00.. = PCF Length: 4

.... ..10 = PCF Integrity Indication: PCF value first half integrity protected (0x2)

PCF Value: cafebabe

Data: 5e5d5c53

0000	00 00 00 00 00 00 00 00	00 00 00 00 08 00 45 00E.
0010	00 3a a8 04 40 00 40 11	94 ac 7f 00 00 01 7f 00	...@.@.
0020	00 01 27 10 27 0f 00 26	fe 39 d8 00 7f f1 1c 80	...'..& .9.....
0030	49 28 ad bb 2c 61 63 be	74 48 fa 35 1e b5 01 12	I(..,ac, tH.5....
0040	ca fe ba be 5e 5d 5c 53	^]\S

Path Layer UDP Substrate (plus), 30 Bytes

Pakete: 16 - Angezeigt: 10 (62.5%)

Profil:Default



Some Statistics



- 123 lines of LUA code
- ...of which 47 are comments
- ...and 18 are blank lines
- ...leaving 58 lines of code
- Doesn't do "protocol handover" to other dissectors
- Port 9999 hardcoded, but can use "Analyze > Decode as..."
- No error handling
- But it's a start!

About that work...



- Clone `git@github.com:sten13/plus-dissector.git`
- (would push to mami-project, but can't create repos)
- Copy `plus.lua` to Wireshark plugin folder
 - Preferably personal plugin folder, see Help > About > Folders
- My student is working on a fuzzer for shim-layer protocols
- ...and PLUS in particular
- Works with Roman and (soon) with Tobias as well
- Could write blog post...?