

Wireshark #1

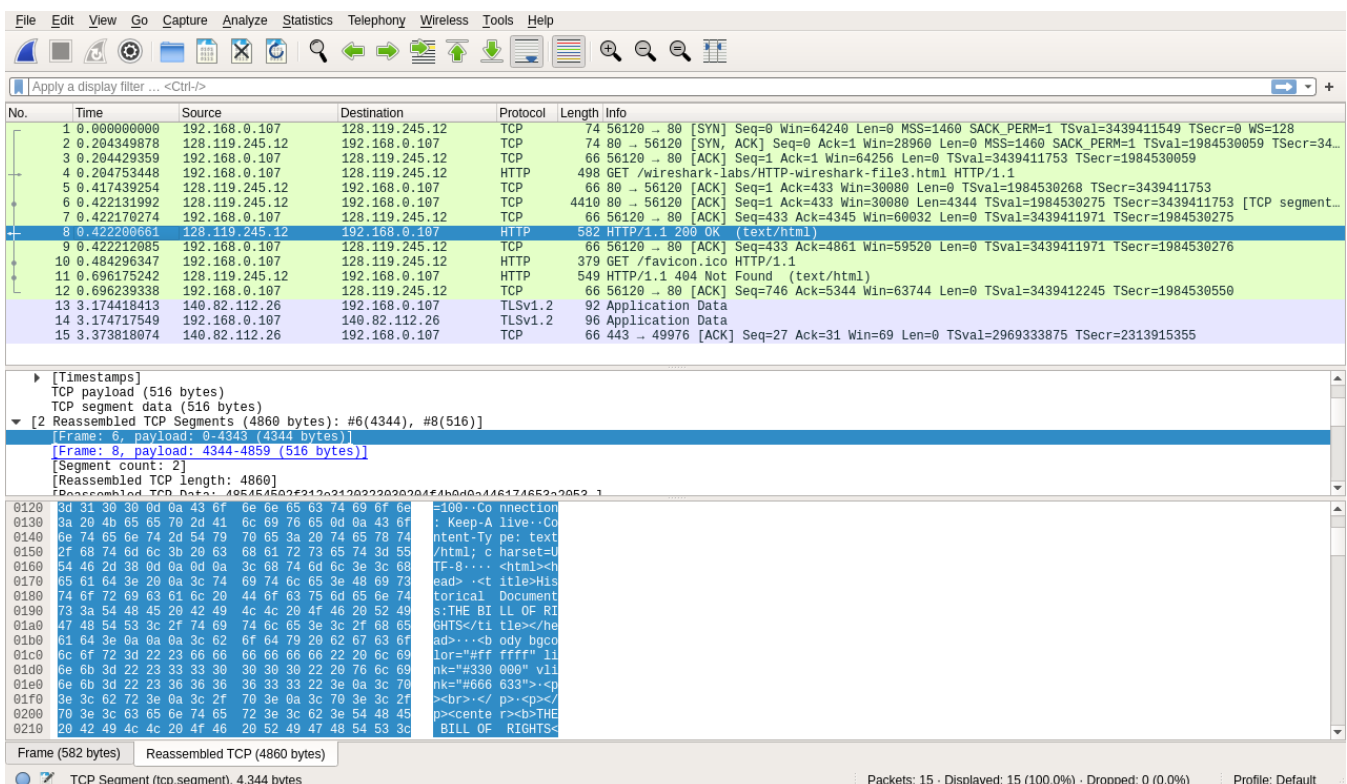


Figure 1: Sniffed packets while visiting `http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file3.html`

- (1) How many HTTP GET request messages were sent by your browser?
[Answer] There were 2 HTTP GET requests sent by the browser: one for requesting `HTTP-wireshark-file3.html`, and the other for requesting `favicon.ico`.
- (2) How many data-containing TCP segments were needed to carry the single HTTP response?

[Answer] There were 2 TCP segments containing data for the html file, namely #6 and #8.

- (3) What is the status code and phrase associated with the response to the HTTP GET request?

[Answer] Req #4, resp #8: the status code was 200, and the status text was OK.

Req #10, resp #11: the status code was 404, and the status text was Not found.

- (4) Which packet number in the trace contains the GET message for the Bill of Rights?

[Answer] #4

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	192.168.0.107	128.119.245.12	TCP	74	58132 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK PERM=1 Tsv=
2	0.010038556	192.168.0.107	128.119.245.12	TCP	74	58134 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK PERM=1 Tsv=
3	0.207032964	128.119.245.12	192.168.0.107	TCP	74	80 → 58132 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK
4	0.207095876	192.168.0.107	128.119.245.12	TCP	66	58134 → 80 [ACK] Seq=1 Ack=1 Win=64256 Len=0 Tsv=3388262051 Tsv=
5	0.220756404	128.119.245.12	192.168.0.107	TCP	74	80 → 58134 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK
6	0.220814640	192.168.0.107	128.119.245.12	TCP	66	58134 → 80 [ACK] Seq=1 Ack=1 Win=64256 Len=0 Tsv=3388262065 Tsv=
7	0.221209050	192.168.0.107	128.119.245.12	HTTP	463	GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
8	0.440719557	128.119.245.12	192.168.0.107	HTTP	1138	HTTP/1.1 200 OK (text/html)
9	0.440773744	192.168.0.107	128.119.245.12	HTTP	394	GET /kurose/cover/5th.ed.jpg HTTP/1.1
10	0.443290607	128.119.245.12	192.168.0.107	TCP	66	80 → 58134 [ACK] Seq=1 Ack=398 Win=30080 Len=0 Tsv=3388262622
11	0.443321672	192.168.0.107	128.119.245.12	TCP	66	[TCP Window Update] 58134 → 80 [ACK] Seq=398 Ack=1073 Win=64128
12	0.487201275	192.168.0.107	128.119.245.12	HTTP	420	GET /pearson.png HTTP/1.1
13	0.487997742	192.168.0.107	1.214.68.2	DNS	78	Standard query 0x50a9 A manic.cs.umass.edu
14	0.488119924	192.168.0.107	1.214.68.2	DNS	78	Standard query response 0x50a9 A manic.cs.umass.edu CNAME gaia...
15	0.700248469	1.214.68.2	192.168.0.107	DNS	113	Standard query response 0x50a9 A manic.cs.umass.edu CNAME gaia...
16	0.703672411	128.119.245.12	192.168.0.107	HTTP	2962	HTTP/1.1 200 OK (PNG)[Unreassembly Packet]
17	0.703936632	192.168.0.107	128.119.245.12	TCP	66	58134 → 80 [ACK] Seq=752 Ack=3969 Win=61312 Len=0 Tsv=3388262622
18	0.704051075	128.119.245.12	192.168.0.107	HTTP	788	Continuation
19	0.704083067	192.168.0.107	128.119.245.12	TCP	66	58134 → 80 [ACK] Seq=752 Ack=4683 Win=60672 Len=0 Tsv=3388262622
20	0.934418684	192.168.0.107	216.58.197.100	TCP	66	53644 → 80 [ACK] Seq=1 Ack=1 Win=501 Len=0 Tsv=2041270907 Tsv=
21	0.934438688	216.58.197.100	192.168.0.107	TCP	66	[TCP ACKed unseen segment] 80 → 53644 [ACK] Seq=1 Ack=2 Win=201
22	1.003021563	192.168.0.107	128.119.245.12	DNS	150	Standard query response 0x5108 AAAA manic.cs.umass.edu CNAME gaia...
23	1.009391766	192.168.0.107	128.119.245.12	TCP	74	58136 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK PERM=1 Tsv=
24	1.230619413	128.119.245.12	192.168.0.107	TCP	74	80 → 58136 [SYN, ACK] Seq=0 Ack=1 Win=28960 Len=0 MSS=1460 SACK
25	1.230697983	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=1 Ack=1 Win=64256 Len=0 Tsv=3388263083 Tsv=
26	1.230708074	192.168.0.107	128.119.245.12	HTTP	394	GET /kurose/cover/5th.ed.jpg HTTP/1.1
27	1.473148086	128.119.245.12	192.168.0.107	HTTP	5858	HTTP/1.1 200 OK (JPEG JFIF image)[Unreassembly Packet]
28	1.473210256	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=5793 Win=58496 Len=0 Tsv=3388263083
29	1.473303464	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
30	1.473323992	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=7241 Win=57088 Len=0 Tsv=3388263083
31	1.474129355	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
32	1.474160392	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=11585 Win=59008 Len=0 Tsv=3388263083
33	1.474200540	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
34	1.474211370	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=13033 Win=57600 Len=0 Tsv=3388263083
35	1.474295482	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
36	1.474312911	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=14481 Win=63104 Len=0 Tsv=3388263083
37	1.474325150	128.119.245.12	192.168.0.107	TCP	66	80 → 58136 [ACK] Seq=1 Ack=329 Win=30080 Len=0 Tsv=1850604045
38	1.474333766	192.168.0.107	128.119.245.12	TCP	66	[TCP Dup ACK 3661] 58136 → 80 [ACK] Seq=329 Ack=14481 Win=63104
39	1.703747288	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
40	1.703794574	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=17377 Win=61056 Len=0 Tsv=3388263083
41	1.704060292	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
42	1.704083163	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=20273 Win=61056 Len=0 Tsv=3388263083
43	1.704060935	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
44	1.704073531	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=21721 Win=63104 Len=0 Tsv=3388263083
45	1.704304503	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
46	1.704323337	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=24617 Win=61056 Len=0 Tsv=3388263083
47	1.704798185	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
48	1.704823411	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=28961 Win=59008 Len=0 Tsv=3388263083
49	1.704891726	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
50	1.705010947	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=31857 Win=61056 Len=0 Tsv=3388263083
51	1.705281989	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
52	1.705305511	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=34753 Win=61056 Len=0 Tsv=3388263083
53	1.705571316	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
54	1.705587050	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=37649 Win=61056 Len=0 Tsv=3388263083
55	1.705953835	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
56	1.705990632	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=41993 Win=72832 Len=0 Tsv=3388263083
57	1.706101590	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
58	1.706125202	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=43441 Win=75776 Len=0 Tsv=3388263083
59	1.935323217	128.119.245.12	192.168.0.107	HTTP	5858	Continuation
60	1.935313393	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=49233 Win=87296 Len=0 Tsv=3388263083
61	1.935634506	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
62	1.935651240	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=53577 Win=96000 Len=0 Tsv=3388263083
63	1.935900893	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
64	1.935917727	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=56473 Win=101760 Len=0 Tsv=3388263083
65	1.936184706	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
66	1.936204889	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=59369 Win=107648 Len=0 Tsv=3388263083
67	1.936461008	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
68	1.936483977	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=62265 Win=113408 Len=0 Tsv=3388263083
69	1.936724329	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
70	1.936748392	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=65161 Win=119168 Len=0 Tsv=3388263083
71	1.936987056	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
72	1.937005408	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=66609 Win=122112 Len=0 Tsv=3388263083
73	1.937032921	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
74	1.937046224	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=68057 Win=124928 Len=0 Tsv=3388263083
75	1.937457008	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
76	1.937477311	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=72401 Win=133632 Len=0 Tsv=3388263083
77	1.937717297	128.119.245.12	192.168.0.107	HTTP	2962	Continuation
78	1.937737449	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=75297 Win=139392 Len=0 Tsv=3388263083
79	1.938087297	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
80	1.938105722	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=79641 Win=148096 Len=0 Tsv=3388263083
81	1.939131118	128.119.245.12	192.168.0.107	HTTP	8754	Continuation
82	1.939171251	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=88329 Win=160512 Len=0 Tsv=3388263083
83	1.939261944	128.119.245.12	192.168.0.107	HTTP	1514	Continuation
84	1.939281095	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=89777 Win=159104 Len=0 Tsv=3388263083
85	1.939505204	128.119.245.12	192.168.0.107	HTTP	4410	Continuation
86	1.939618149	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=94121 Win=166656 Len=0 Tsv=3388263083
87	1.940078759	128.119.245.12	192.168.0.107	HTTP	5858	Continuation
88	1.940324774	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=99913 Win=166656 Len=0 Tsv=3388263083
89	1.940438132	128.119.245.12	192.168.0.107	HTTP	1471	Continuation
90	1.940471648	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [ACK] Seq=329 Ack=101319 Win=169472 Len=0 Tsv=3388263083
91	2.630979902	192.168.0.107	128.119.245.12	TSV1.2	92	Application Data
92	2.640291222	192.168.0.107	128.119.245.12	TSV1.2	92	Application Data
93	2.855540976	128.119.245.12	192.168.0.107	TCP	66	58132 → 80 [FIN, ACK] Seq=27 Ack=31 Win=69 Len=0 Tsv=2273669383 Tsv=
94	5.522639326	192.168.0.107	34.215.78.214	TCP	66	58132 → 80 [FIN, ACK] Seq=1 Ack=1 Win=64256 Len=0 Tsv=3388263083
95	5.522639376	192.168.0.107	34.215.78.214	TCP	66	50108 → 443 [ACK] Seq=1 Ack=1 Win=501 Len=0 Tsv=645023224 Tsv=
96	5.650799276	128.119.245.12	192.168.0.107	TCP	66	80 → 58132 [FIN, ACK] Seq=1 Ack=1 Win=29056 Len=0 Tsv=185095045
97	5.650800655	128.119.245.12	192.168.0.107	TCP	66	58132 → 80 [ACK] Seq=1 Ack=1 Win=64256 Len=0 Tsv=185095045
98	5.701806972	34.215.78.214	192.168.0.107	TCP	66	[TCP ACKed unseen segment] 443 → 50108 [ACK] Seq=1 Ack=2 Win=19
99	5.711387849	128.119.245.12	192.168.0.107	TCP	66	80 → 58134 [FIN, ACK] Seq=4683 Ack=752 Win=31104 Len=0 Tsv=185095045
100	5.711682411	192.168.0.107	128.119.245.12	TCP	66	58134 → 80 [FIN, ACK] Seq=752 Ack=4684 Win=64128 Len=0 Tsv=185095045
101	5.927348370	128.119.245.12	192.168.0.107	TCP	66	80 → 58134 [ACK] Seq=4684 Ack=753 Win=31104 Len=0 Tsv=185095045
102	17.490575782	128.119.245.12	192.168.0.107	TCP	66	58134 → 80 [FIN, ACK] Seq=101319 Ack=329 Win=30080 Len=0 Tsv=3388263083
103	6.479302021	192.168.0.107	128.119.245.12	TCP	66	58136 → 80 [FIN, ACK] Seq=329 Ack=101319 Win=169472 Len=0 Tsv=3388263083
104	6.710257390	128.119.245.12	192.168.0.107	TCP	66	80 → 58136 [ACK] Seq=101319 Ack=330 Win=30080 Len=0 Tsv=185095045
105	11.74379171	192.168.0.107	216.58.197.100	TCP	66	[TCP Dup ACK 9861] 53644 → 80 [ACK] Seq=1 Ack=1 Win=501 Len=0 Tsv=
106	12.245307099	216.58.197.100	192.168.0.107	TCP	66	[TCP Dup ACK 2141] [TCP ACKed unseen segment] 80 → 53644 [ACK]
107	15.782205459	192.168.0.107	34.215.78.214	TCP	66	[TCP Dup ACK 9861] 50108 → 443 [ACK] Seq=1 Ack=1 Win=501 Len=0 Tsv=
108	15.942420321	34.215.78.214	192.168.0.107	TCP	66	[TCP Dup ACK 9861] [TCP ACKed unseen segment] 443 → 50108 [ACK]
Source: 192.168.0.107 Destination: 128.119.245.12 Transmission Control Protocol, Src Port: 58132, Dst Port: 80, Seq: 0, Len: 0 Source Port: 58132 Destination Port: 80 (Stream index 0) (TCP Segment Len: 81) 0000 30 3c 81 69 40 00 00 6f 3f 63 4d b0 06 08 00 45 00 50108 → 443 [ACK] Seq=1 Ack=1 Win=501 Len=0 Tsv=3388263083 0010 50 3c 81 69 40 00 00 00 82 b6 c0 a8 00 60 80 77 <10> 0k-w 0020 05 0c 01 14 50 21 54 47 a1 00 00 00 00 80 8						

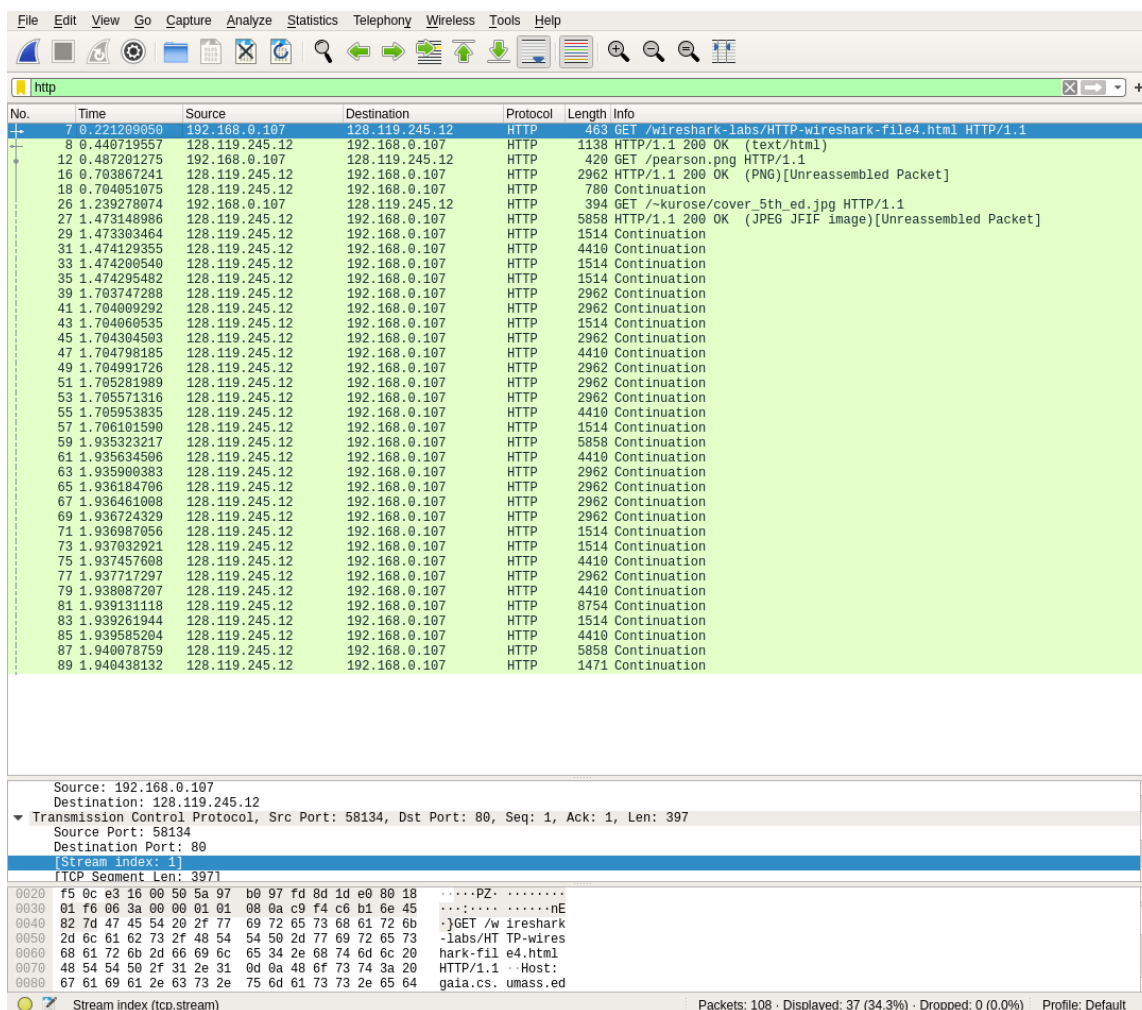


Figure 3: Sniffed packets while visiting <http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html>, filtering the http responses only

- (5) How many HTTP GET request messages were sent by your browser? To which Internet addresses were these GET requests sent?

[Answer] There are 3 HTTP GET request messages were sent by the browser: for requesting `HTTP-wireshark-file4.html`, `pearson.png`, and `cover_5th_ed.jpg`. All 3 requests are sent to the IP address `128.119.245.12`.

The reason why the browser did not try to download the favicon, which is a different behavior from the result of (1), is because of the cache feature of the browser.

- (6) Can you tell whether your browser downloaded the two images serially,

or whether they were downloaded from the two web sites in parallel? Explain.

[Answer] They were downloaded serially. We can identify which requests and continuations correspond to which file streams via seeing the stream index. The HTTP response #16 and Continuation #18 were indexed by the stream index 1, and the HTTP response #27 and the Continuations after #18, which are #29, #31, ..., #89, were indexed by the stream index 3. Thus, we notice that the browser started to download `cover_5th_ed.jpg` from `/~kurose/cover_5th_ed.jpg` after downloading `pearson.png` completely. Hence, the download of two files was done serially.