CSE 307 Lab 2

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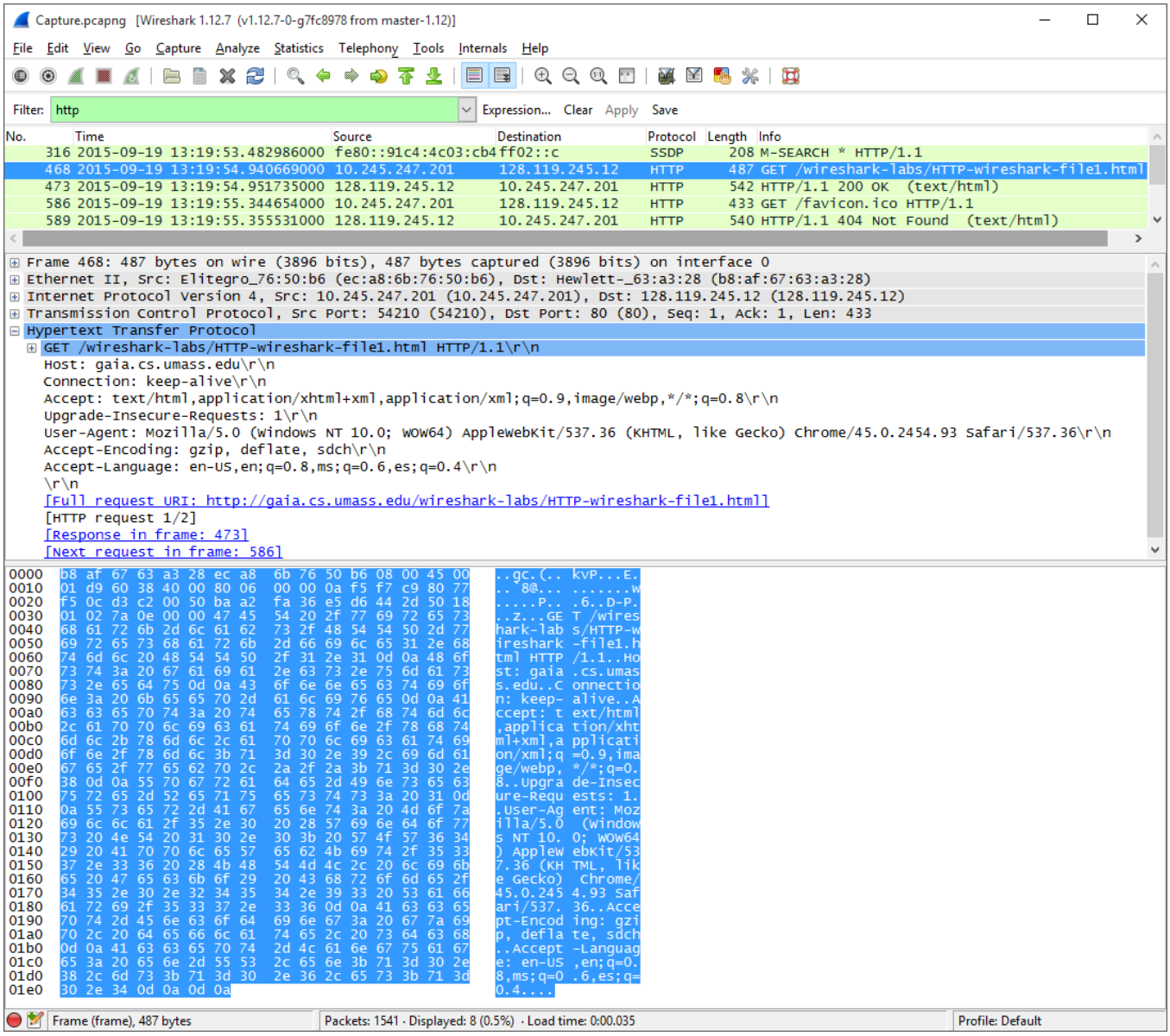
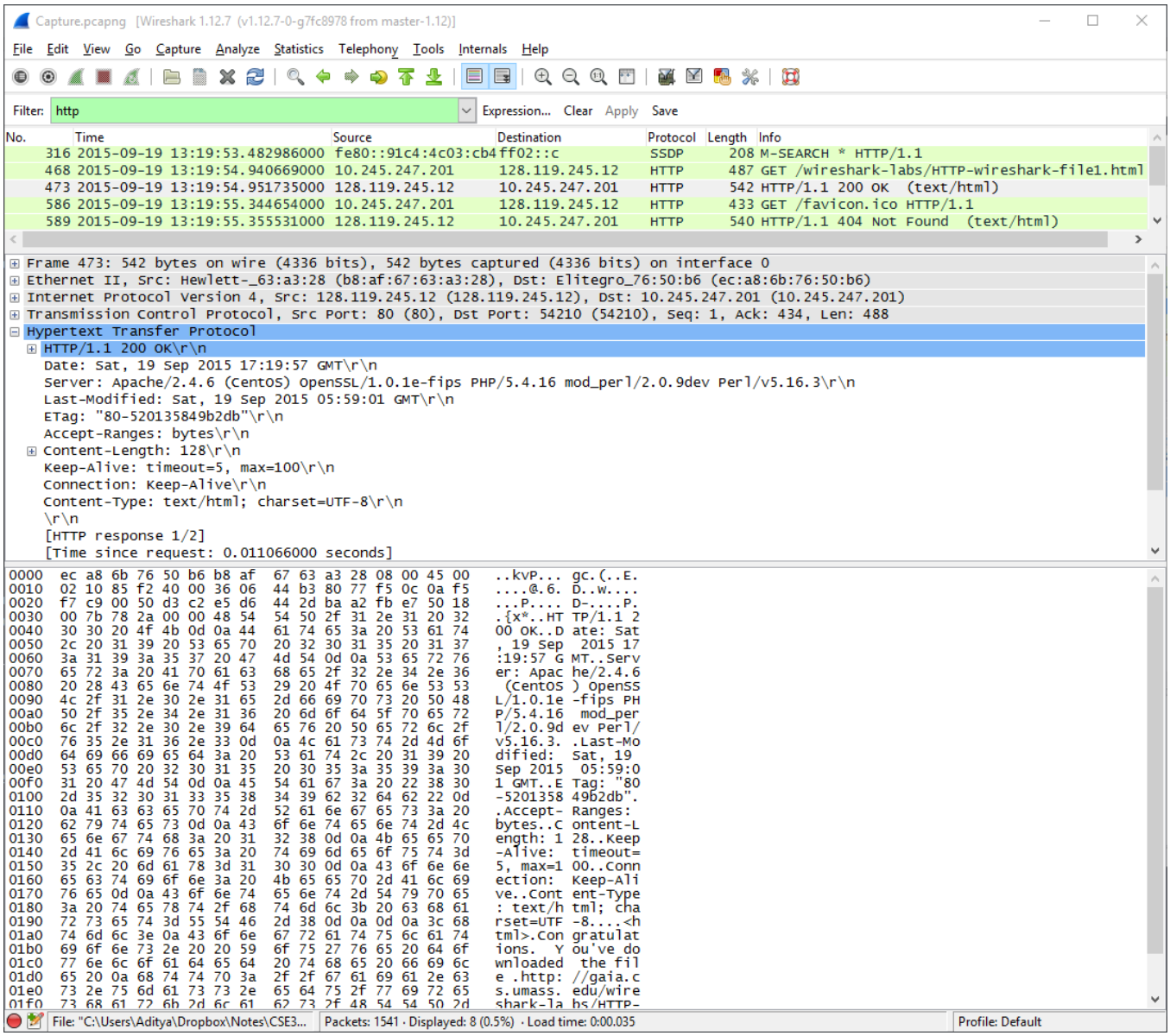
I. WireShark HTTP Lab

Part 1

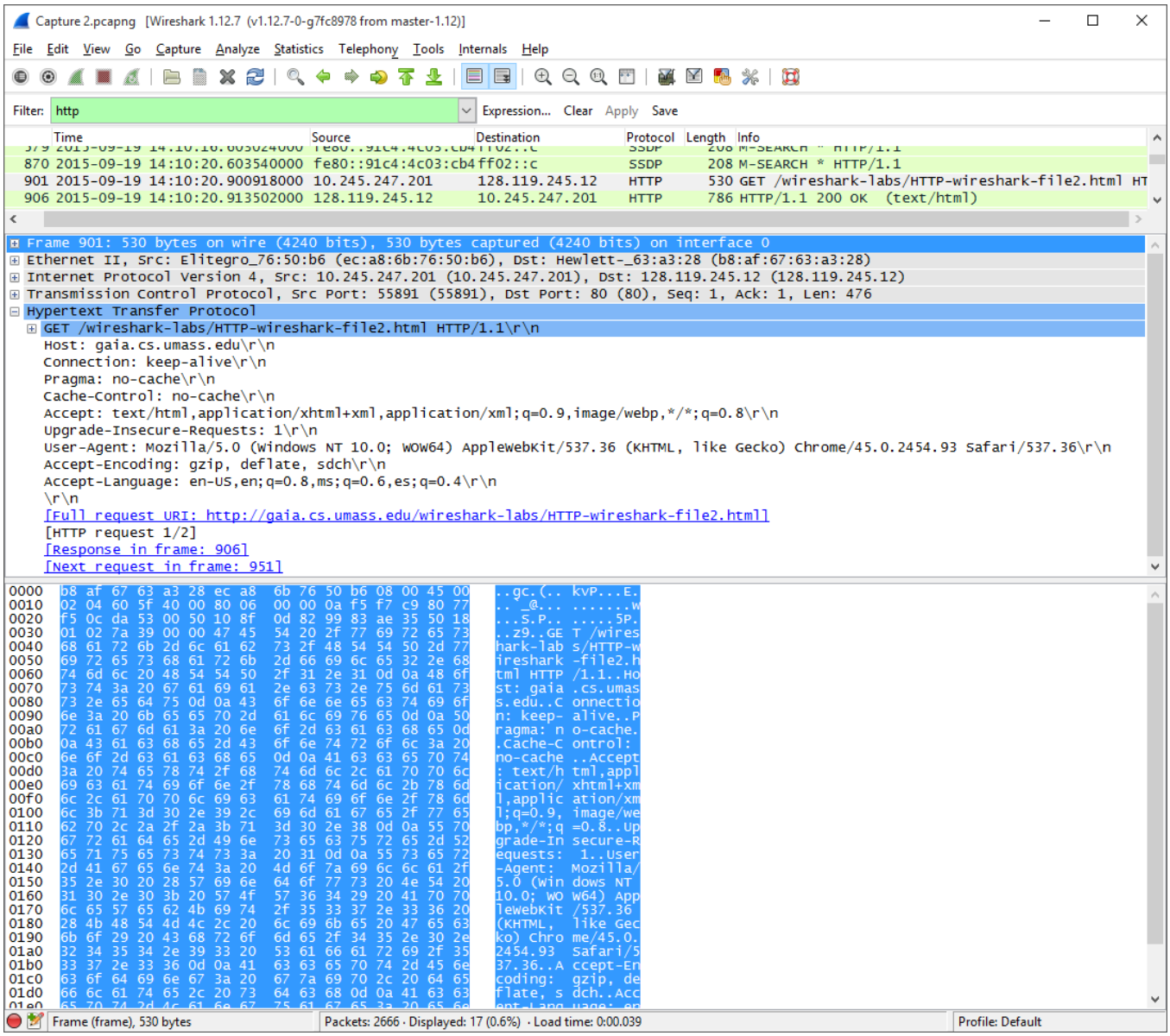
1. HTTP 1.1
2. The browser accepts English (US) as mentioned in `Accept-Language: en-US,en;`
3. My IP Address : 10.245.247.201
   gaia IP Address : 128.119.245.12
4. The server returns status code 200 which is HTTP OK
5. Last-Modified: Sat, 19 Sep 2015 05:59:01 GMT
6. 128 Bytes
7. No, all the headers are found in the raw data

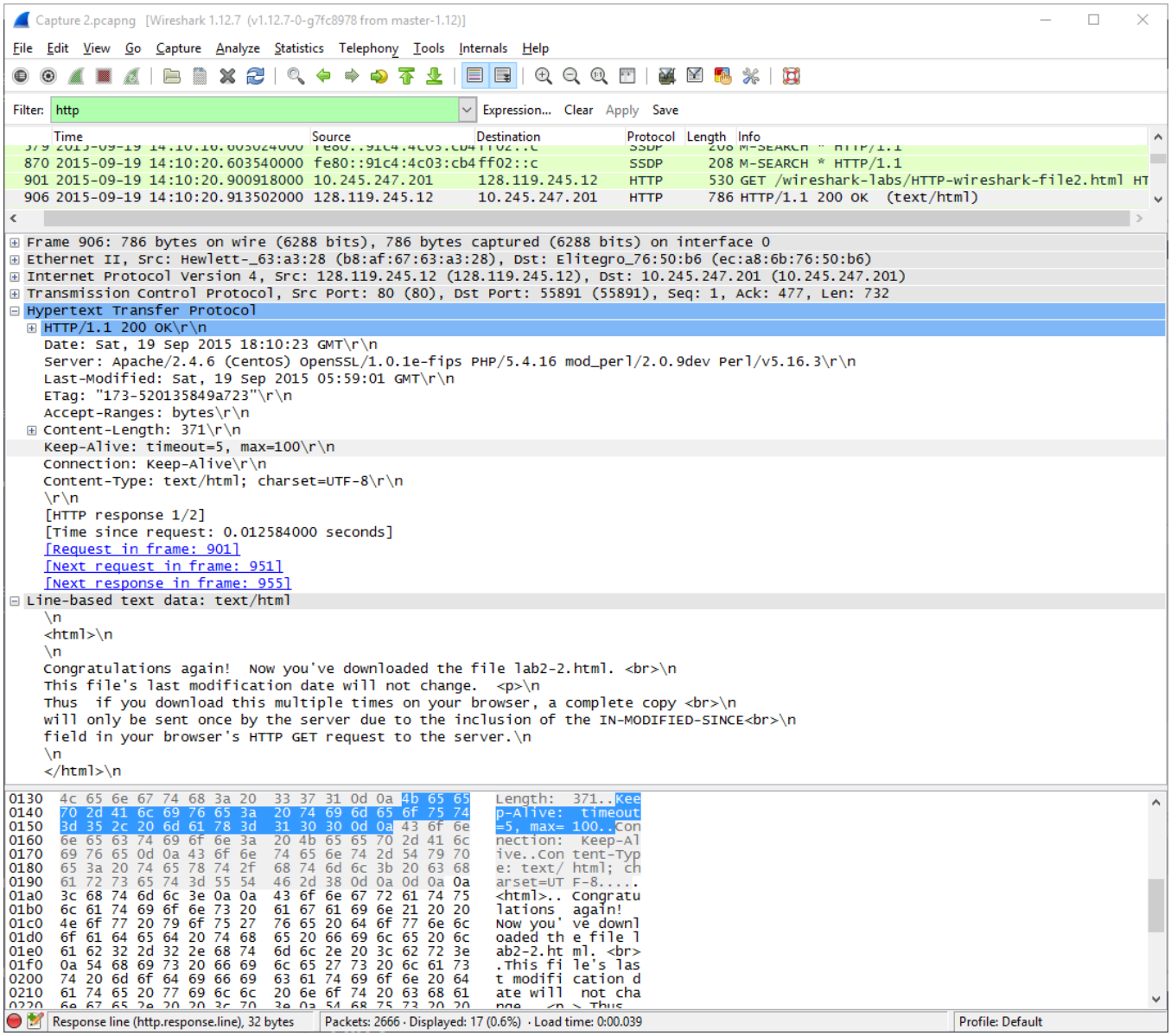


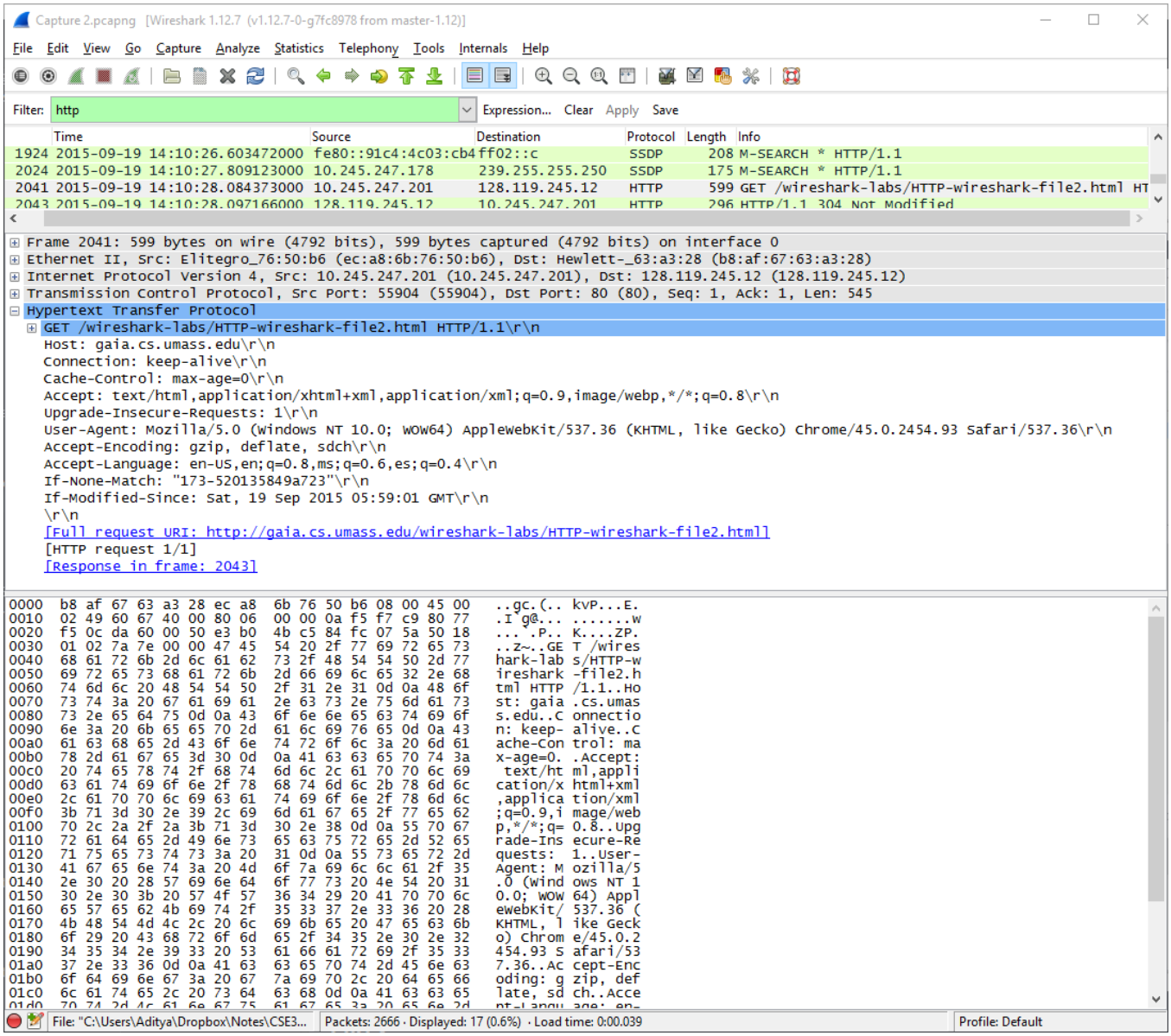


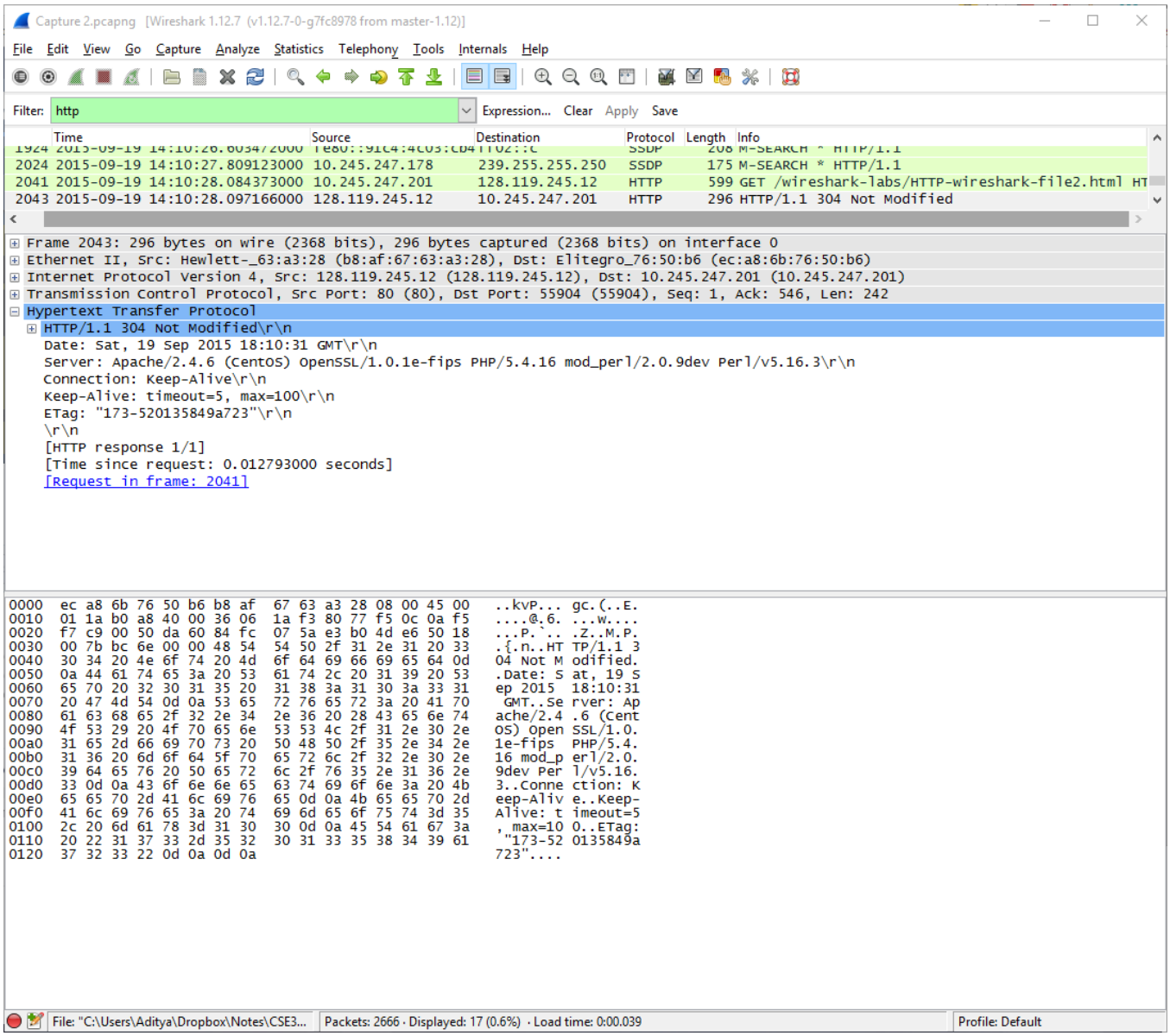
Part 2

1. No, the first one does not have IF-MODIFIED-SINCE
2. Yes the server explicitly returns the content of the file, since its there in the raw data
3. Yes, the second HTTP GET Request contains an IF-MODIFIED-SINCE header, and it contains the date and time of when the page was last modified
4. The server return a 304 NOT MODIFIED, and it did not explicitly return the contents of the file.


Capture 2.pcapng [Wireshark 1.12.7 (v1.12.7-0-g7fc8978 from master-1.12)]
File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help
Filter: http
Expression... Clear Apply Save
Time Source Destination Protocol Length Info
870 2015-09-19 14:10:20.603540000 fe80::91c4:4c03:cb4 ff02::c SSDP 208 M-SEARCH * HTTP/1.1
901 2015-09-19 14:10:20.900918000 10.245.247.201 128.119.245.12 HTTP 530 GET /wireshark-labs/HTTP-wireshark-file2.html HT
906 2015-09-19 14:10:20.913502000 128.119.245.12 10.245.247.201 HTTP 786 HTTP/1.1 200 OK (text/html)
Frame 901: 530 bytes on wire (4240 bits), 530 bytes captured (4240 bits) on interface 0
Ethernet II, Src: Elitegro_76:50:b6 (ec:a8:6b:76:50:b6), Dst: Hewlett-_63:a3:28 (b8:af:67:63:a3:28)
Internet Protocol Version 4, Src: 10.245.247.201 (10.245.247.201), Dst: 128.119.245.12 (128.119.245.12)
Transmission Control Protocol, Src Port: 55891 (55891), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 476
Hypertext Transfer Protocol
GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
Pragma: no-cache\r\n
Cache-Control: no-cache\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
Upgrade-Insecure-Requests: 1\r\n
User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/45.0.2454.93 Safari/537.36\r\n
Accept-Encoding: gzip, deflate, sdch\r\n
Accept-Language: en-US,en;q=0.8,ms;q=0.6,es;q=0.4\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
[HTTP request 1/2]
[Response in frame: 906]
[Next request in frame: 951]
0000 b8 af 67 63 a3 28 ec a8 6b 76 50 b6 08 00 45 00 ..gc.(.. kvP...E.
0010 02 04 60 5f 40 00 80 06 00 00 0a f5 f7 c9 80 77 .. `_@... ....w
0020 f5 0c da 53 00 50 10 8f 0d 82 99 83 ae 35 50 18 ...S.P.. .....5P.
0030 01 02 7a 39 00 00 47 45 54 20 2f 77 69 72 65 73 ..z9..GE T /wires
0040 68 61 72 6b 2d 6c 61 62 73 2f 48 54 54 50 2d 77 hark-lab s/HTTP-w
0050 69 72 65 73 68 61 72 6b 2d 66 69 6c 65 32 2e 68 ireshark -file2.h
0060 74 6d 6c 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f tml HTTP /1.1..Ho
0070 73 74 3a 20 67 61 69 61 2e 63 73 2e 75 6d 61 73 st: gaia .cs.umas
0080 73 2e 65 64 75 0d 0a 43 6f 6e 6e 65 63 74 69 6f s.edu..C onnectio
0090 6e 3a 20 6b 65 65 70 2d 61 6c 69 76 65 0d 0a 50 n: keep- alive..P
00a0 72 61 67 6d 61 3a 20 6e 6f 2d 63 61 63 68 65 0d ragma: n o-cache.
00b0 0a 43 61 63 68 65 2d 43 6f 6e 74 72 6f 6c 3a 20 .Cache-C ontrol:
00c0 6e 6f 2d 63 61 63 68 65 0d 0a 41 63 63 65 70 74 no-cache ..Accept
00d0 3a 20 74 65 78 74 2f 68 74 6d 6c 2c 61 70 70 6c : text/h tml,appl
00e0 69 63 61 74 69 6f 6e 2f 78 68 74 6d 6c 2b 78 6d ication/ xhtml+xm
00f0 6c 2c 61 70 70 6c 69 63 61 74 69 6f 6e 2f 78 6d l,applic ation/xm
0100 6c 3b 71 3d 30 2e 39 2c 69 6d 61 67 65 2f 77 65 l;q=0.9, image/we
0110 62 70 2c 2a 2f 2a 3b 71 3d 30 2e 38 0d 0a 55 70 bp,*/*;q =0.8..Up
0120 67 72 61 64 65 2d 49 6e 73 65 63 75 72 65 2d 52 grade-In secure-R
0130 65 71 75 65 73 74 73 3a 20 31 0d 0a 55 73 65 72 equests: 1..User
0140 2d 41 67 65 6e 74 3a 20 4d 6f 7a 69 6c 6c 61 2f -Agent: Mozilla/
0150 35 2e 30 20 28 57 69 6e 64 6f 77 73 20 4e 54 20 5.0 (Win dows NT
0160 31 30 2e 30 3b 20 57 4f 57 36 34 29 20 41 70 70 10.0; WO W64) App
0170 6c 65 57 65 62 4b 69 74 2f 35 33 37 2e 33 36 20 leWebKit /537.36
0180 28 4b 48 54 4d 4c 2c 20 6c 69 6b 65 20 47 65 63 (KHTML, like Gec
0190 6b 6f 29 20 43 68 72 6f 6d 65 2f 34 35 2e 30 2e ko) Chro me/45.0.
01a0 32 34 35 34 2e 39 33 20 53 61 66 61 72 69 2f 35 2454.93 Safari/5
01b0 33 37 2e 33 36 0d 0a 41 63 63 65 70 74 2d 45 6e 37.36..A ccept-En
01c0 63 6f 64 69 6e 67 3a 20 67 7a 69 70 2c 20 64 65 coding: gzip, de
01d0 66 6c 61 74 65 2c 20 73 64 63 68 0d 0a 41 63 63 flate, s dch..Acc
Frame (frame), 530 bytes
Packets: 2666 · Displayed: 17 (0.6%) · Load time: 0:00.039
Profile: Default

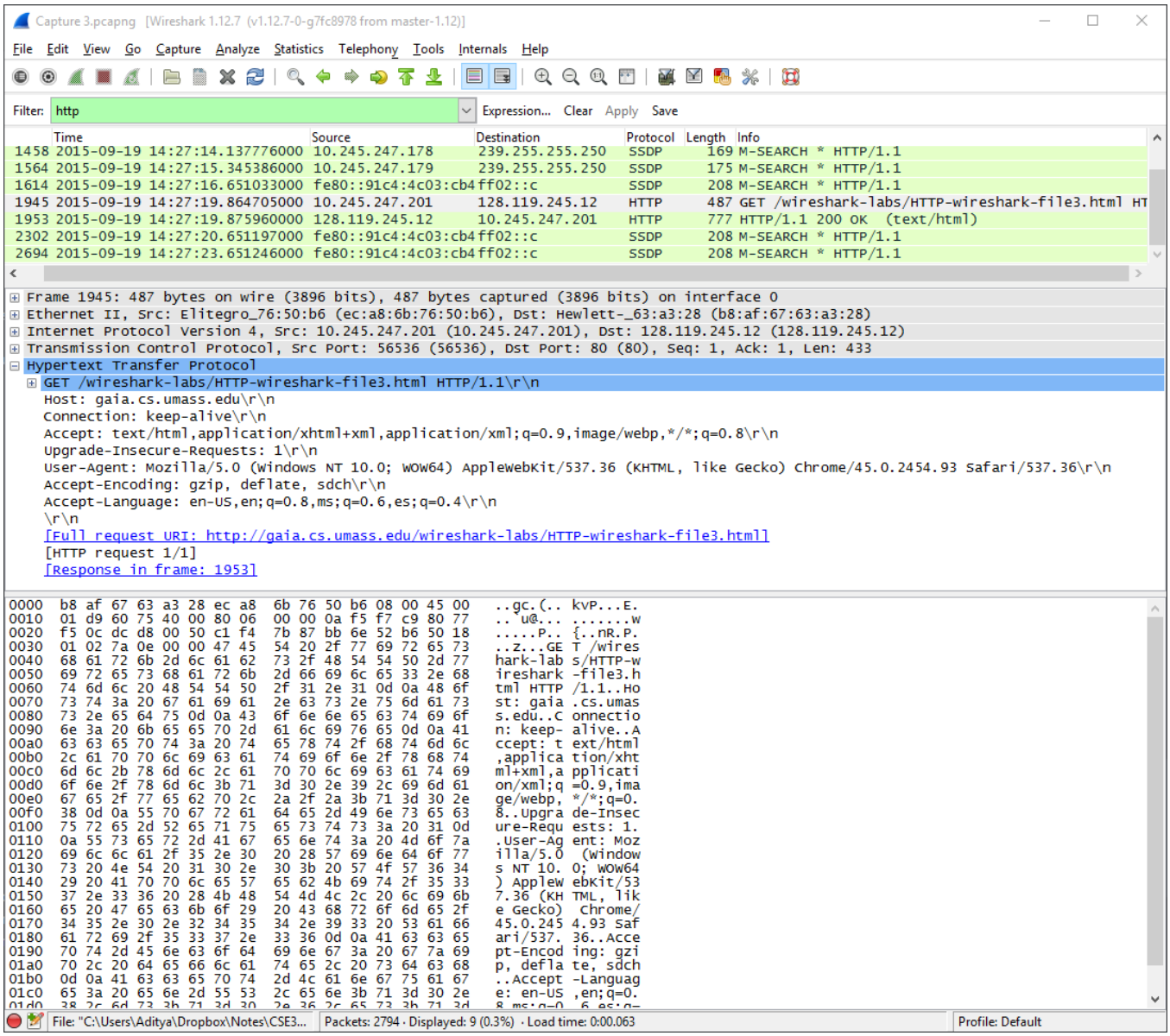

Capture 2.pcapng [Wireshark 1.12.7 (v1.12.7-0-g7fc8978 from master-1.12)]
File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help
Filter: http
Expression... Clear Apply Save
Time Source Destination Protocol Length Info
870 2015-09-19 14:10:20.603540000 fe80::91c4:4c03:cb4 ff02::c SSDP 208 M-SEARCH * HTTP/1.1
901 2015-09-19 14:10:20.900918000 10.245.247.201 128.119.245.12 HTTP 530 GET /wireshark-labs/HTTP-wireshark-file2.html HT
906 2015-09-19 14:10:20.913502000 128.119.245.12 10.245.247.201 HTTP 786 HTTP/1.1 200 OK (text/html)
Frame 906: 786 bytes on wire (6288 bits), 786 bytes captured (6288 bits) on interface 0
Ethernet II, Src: Hewlett-_63:a3:28 (b8:af:67:63:a3:28), Dst: Elitegro_76:50:b6 (ec:a8:6b:76:50:b6)
Internet Protocol Version 4, Src: 128.119.245.12 (128.119.245.12), Dst: 10.245.247.201 (10.245.247.201)
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 55891 (55891), Seq: 1, Ack: 477, Len: 732
Hypertext Transfer Protocol
HTTP/1.1 200 OK\r\n
Date: Sat, 19 Sep 2015 18:10:23 GMT\r\n
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.1e-fips PHP/5.4.16 mod_perl/2.0.9dev Perl/v5.16.3\r\n
Last-Modified: Sat, 19 Sep 2015 05:59:01 GMT\r\n
ETag: "173-520135849a723"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 371\r\n
Keep-Alive: timeout=5, max=100\r\n
Connection: Keep-Alive\r\n
Content-Type: text/html; charset=UTF-8\r\n
\r\n
[HTTP response 1/2]
[Time since request: 0.012584000 seconds]
[Request in frame: 901]
[Next request in frame: 951]
[Next response in frame: 955]
Line-based text data: text/html
\n
<html>\n
\n
Congratulations again! Now you've downloaded the file lab2-2.html.
\n
This file's last modification date will not change. <p>\n
Thus if you download this multiple times on your browser, a complete copy
\n
will only be sent once by the server due to the inclusion of the IN-MODIFIED-SINCE
\n
field in your browser's HTTP GET request to the server.\n
\n
</html>\n
0130 4c 65 6e 67 74 68 3a 20 33 37 31 0d 0a 4b 65 65 Length: 371..Kee
0140 70 2d 41 6c 69 76 65 3a 20 74 69 6d 65 6f 75 74 p-Alive: timeout
0150 3d 35 2c 20 6d 61 78 3d 31 30 30 0d 0a 43 6f 6e =5, max= 100..Con
0160 6e 65 63 74 69 6f 6e 3a 20 4b 65 65 70 2d 41 6c nection: Keep-Al
0170 69 76 65 0d 0a 43 6f 6e 74 65 6e 74 2d 54 79 70 ive..Con tent-Typ
0180 65 3a 20 74 65 78 74 2f 68 74 6d 6c 3b 20 63 68 e: text/ html; ch
0190 61 72 73 65 74 3d 55 54 46 2d 38 0d 0a 0d 0a 0a arset=UT F-8.....
01a0 3c 68 74 6d 6c 3e 0a 0a 43 6f 6e 67 72 61 74 75 <html>.. Congratu
01b0 6c 61 74 69 6f 6e 73 20 61 67 61 69 6e 21 20 20 lations again!
01c0 4e 6f 77 20 79 6f 75 27 76 65 20 64 6f 77 6e 6c Now you' ve downl
01d0 6f 61 64 65 64 20 74 68 65 20 66 69 6c 65 20 6c oaded th e file l
01e0 61 62 32 2d 32 2e 68 74 6d 6c 2e 20 3c 62 72 3e ab2-2.ht ml.
01f0 0a 54 68 69 73 20 66 69 6c 65 27 73 20 6c 61 73 .This fi le's las
0200 74 20 6d 6f 64 69 66 69 63 61 74 69 6f 6e 20 64 t modifi cation d
0210 61 74 65 20 77 69 6c 6c 20 6e 6f 74 20 63 68 61 ate will not cha
Response line (http.response.line), 32 bytes
Packets: 2666 · Displayed: 17 (0.6%) · Load time: 0:00.039
Profile: Default

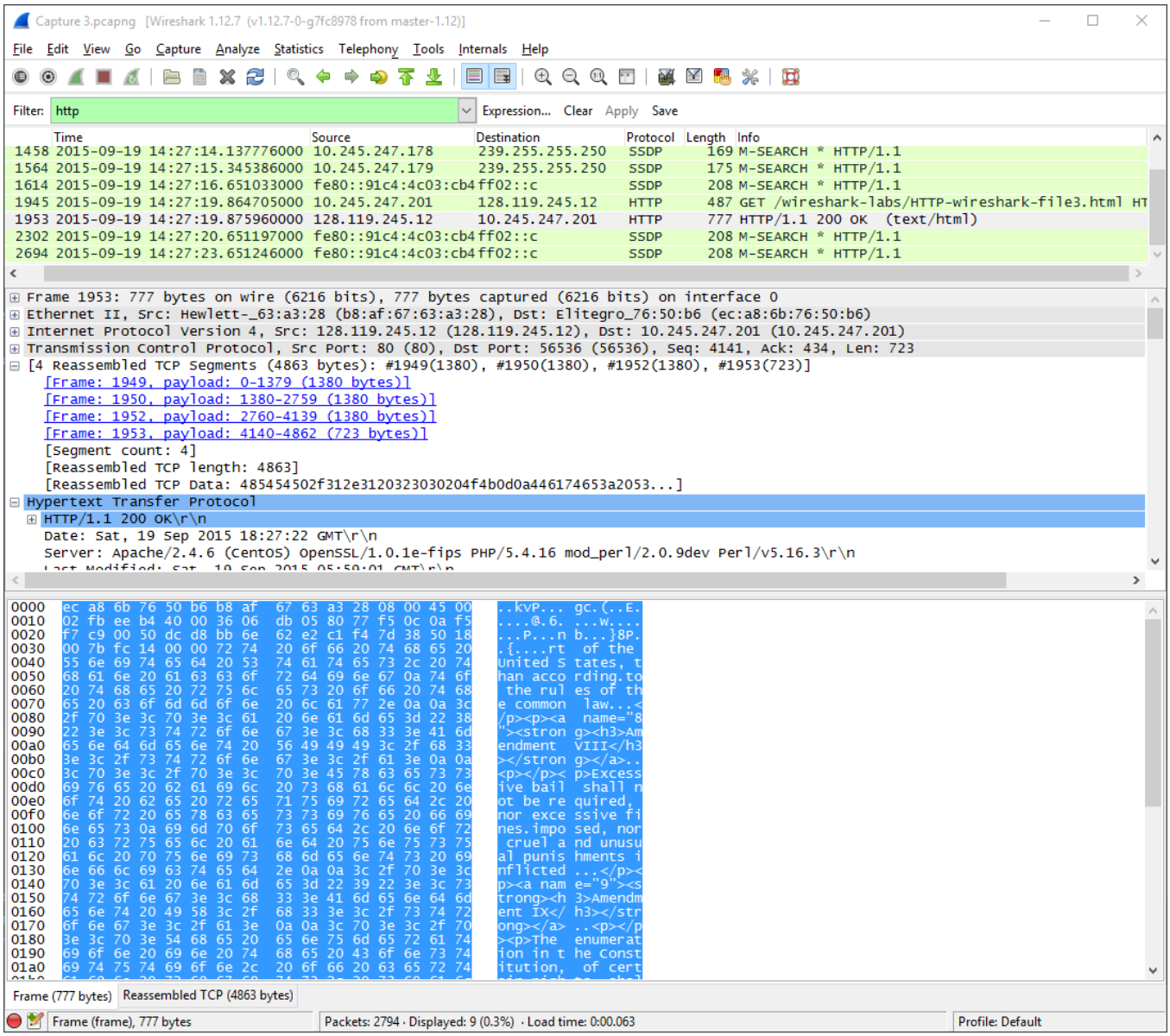

Capture 2.pcapng [Wireshark 1.12.7 (v1.12.7-0-g7fc8978 from master-1.12)]
File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help
Filter: http
Expression... Clear Apply Save
Time Source Destination Protocol Length Info
1924 2015-09-19 14:10:26.603472000 fe80::91c4:4c03:cb4 ff02::c SSDP 208 M-SEARCH * HTTP/1.1
2024 2015-09-19 14:10:27.809123000 10.245.247.178 239.255.255.250 SSDP 175 M-SEARCH * HTTP/1.1
2041 2015-09-19 14:10:28.084373000 10.245.247.201 128.119.245.12 HTTP 599 GET /wireshark-labs/HTTP-wireshark-file2.html HT
2043 2015-09-19 14:10:28.097166000 128.119.245.12 10.245.247.201 HTTP 296 HTTP/1.1 304 Not Modified
Frame 2041: 599 bytes on wire (4792 bits), 599 bytes captured (4792 bits) on interface 0
Ethernet II, Src: Elitegro_76:50:b6 (ec:a8:6b:76:50:b6), Dst: Hewlett-_63:a3:28 (b8:af:67:63:a3:28)
Internet Protocol Version 4, Src: 10.245.247.201 (10.245.247.201), Dst: 128.119.245.12 (128.119.245.12)
Transmission Control Protocol, Src Port: 55904 (55904), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 545
Hypertext Transfer Protocol
GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
Cache-Control: max-age=0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
Upgrade-Insecure-Requests: 1\r\n
User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/45.0.2454.93 Safari/537.36\r\n
Accept-Encoding: gzip, deflate, sdch\r\n
Accept-Language: en-US,en;q=0.8,ms;q=0.6,es;q=0.4\r\n
If-None-Match: "173-520135849a723"\r\n
If-Modified-Since: Sat, 19 Sep 2015 05:59:01 GMT\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
[HTTP request 1/1]
[Response in frame: 2043]
0000 b8 af 67 63 a3 28 ec a8 6b 76 50 b6 08 00 45 00 ..gc.(.. kvP...E.
0010 02 49 60 67 40 00 80 06 00 00 0a f5 f7 c9 80 77 .I`g@... ....w
0020 f5 0c da 60 00 50 e3 b0 4b c5 84 fc 07 5a 50 18 ...`.P.. K....ZP.
0030 01 02 7a 7e 00 00 47 45 54 20 2f 77 69 72 65 73 ..z~..GE T /wires
0040 68 61 72 6b 2d 6c 61 62 73 2f 48 54 54 50 2d 77 hark-lab s/HTTP-w
0050 69 72 65 73 68 61 72 6b 2d 66 69 6c 65 32 2e 68 ireshark -file2.h
0060 74 6d 6c 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f tml HTTP /1.1..Ho
0070 73 74 3a 20 67 61 69 61 2e 63 73 2e 75 6d 61 73 st: gaia .cs.umas
0080 73 2e 65 64 75 0d 0a 43 6f 6e 6e 65 63 74 69 6f s.edu..C onnectio
0090 6e 3a 20 6b 65 65 70 2d 61 6c 69 76 65 0d 0a 43 n: keep- alive..C
00a0 61 63 68 65 2d 43 6f 6e 74 72 6f 6c 3a 20 6d 61 ache-Con trol: ma
00b0 78 2d 61 67 65 3d 30 0d 0a 41 63 63 65 70 74 3a x-age=0. .Accept:
00c0 20 74 65 78 74 2f 68 74 6d 6c 2c 61 70 70 6c 69 text/ht ml,appli
00d0 63 61 74 69 6f 6e 2f 78 68 74 6d 6c 2b 78 6d 6c cation/x html+xml
00e0 2c 61 70 70 6c 69 63 61 74 69 6f 6e 2f 78 6d 6c ,applica tion/xml
00f0 3b 71 3d 30 2e 39 2c 69 6d 61 67 65 2f 77 65 62 ;q=0.9,i mage/web
0100 70 2c 2a 2f 2a 3b 71 3d 30 2e 38 0d 0a 55 70 67 p,*/*;q= 0.8..Upg
0110 72 61 64 65 2d 49 6e 73 65 63 75 72 65 2d 52 65 rade-Ins ecure-Re
0120 71 75 65 73 74 73 3a 20 31 0d 0a 55 73 65 72 2d quests: 1..User-
0130 41 67 65 6e 74 3a 20 4d 6f 7a 69 6c 6c 61 2f 35 Agent: M ozilla/5
0140 2e 30 20 28 57 69 6e 64 6f 77 73 20 4e 54 20 31 .0 (Wind ows NT 1
0150 30 2e 30 3b 20 57 4f 57 36 34 29 20 41 70 70 6c 0.0; WOW 64) Appl
0160 65 57 65 62 4b 69 74 2f 35 33 37 2e 33 36 20 28 eWebKit/ 537.36 (
0170 4b 48 54 4d 4c 2c 20 6c 69 6b 65 20 47 65 63 6b KHTML, l ike Geck
0180 6f 29 20 43 68 72 6f 6d 65 2f 34 35 2e 30 2e 32 o) Chrom e/45.0.2
0190 34 35 34 2e 39 33 20 53 61 66 61 72 69 2f 35 33 454.93 S afari/53
01a0 37 2e 33 36 0d 0a 41 63 63 65 70 74 2d 45 6e 63 7.36..Ac cept-Enc
01b0 6f 64 69 6e 67 3a 20 67 7a 69 70 2c 20 64 65 66 oding: g zip, def
01c0 6c 61 74 65 2c 20 73 64 63 68 0d 0a 41 63 63 65 late, sd ch..Acce
File: "C:\Users\Aditya\Dropbox\Notes\CSE3... Packets: 2666 · Displayed: 17 (0.6%) · Load time: 0:00.039 Profile: Default



Part 3

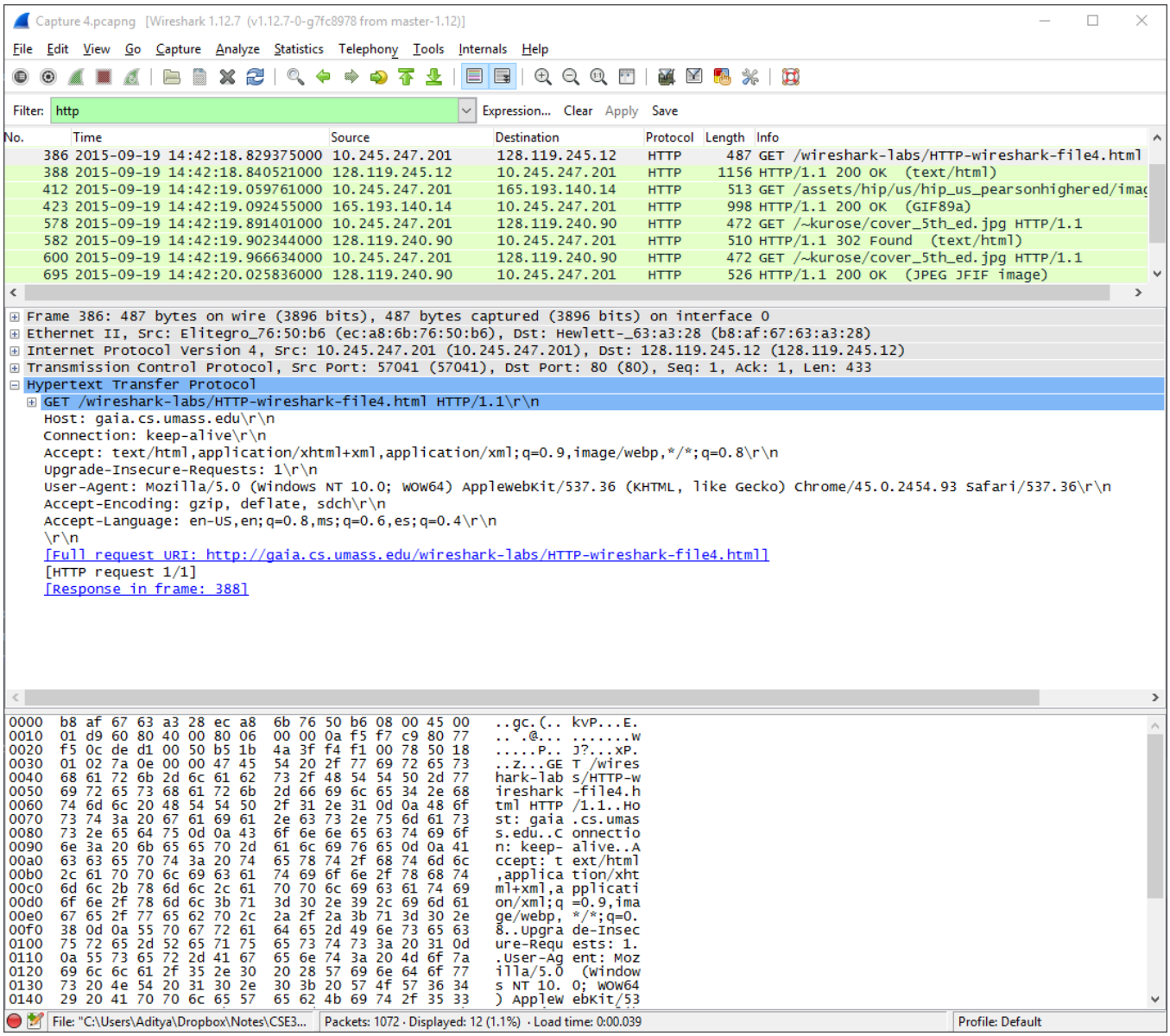
1. The Browser sent 1 HTTP GET request which is packet number 1945
2. Packet number 1953 in the trace contains the status code and phrase associated with the response to the HTTP GET request.
3. Status Code 200, Phrase : HTTP OK
4. 4 TCP Segments


Capture 3.pcapng [Wireshark 1.12.7 (v1.12.7-0-g7fc8978 from master-1.12)]
File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help
Filter: http
Expression... Clear Apply Save
No. Time Source Destination Protocol Length Info
1458 2015-09-19 14:27:14.137776000 10.245.247.178 239.255.255.250 SSDP 169 M-SEARCH * HTTP/1.1
1564 2015-09-19 14:27:15.345386000 10.245.247.179 239.255.255.250 SSDP 175 M-SEARCH * HTTP/1.1
1614 2015-09-19 14:27:16.651033000 fe80::91c4:4c03:cb4 ff02::c SSDP 208 M-SEARCH * HTTP/1.1
1945 2015-09-19 14:27:19.864705000 10.245.247.201 128.119.245.12 HTTP 487 GET /wireshark-labs/HTTP-wireshark-file3.html HT
1953 2015-09-19 14:27:19.875960000 128.119.245.12 10.245.247.201 HTTP 777 HTTP/1.1 200 OK (text/html)
2302 2015-09-19 14:27:20.651197000 fe80::91c4:4c03:cb4 ff02::c SSDP 208 M-SEARCH * HTTP/1.1
2694 2015-09-19 14:27:23.651246000 fe80::91c4:4c03:cb4 ff02::c SSDP 208 M-SEARCH * HTTP/1.1
Frame 1945: 487 bytes on wire (3896 bits), 487 bytes captured (3896 bits) on interface 0
Ethernet II, Src: Elitegro_76:50:b6 (ec:a8:6b:76:50:b6), Dst: Hewlett-_63:a3:28 (b8:af:67:63:a3:28)
Internet Protocol Version 4, Src: 10.245.247.201 (10.245.247.201), Dst: 128.119.245.12 (128.119.245.12)
Transmission Control Protocol, Src Port: 56536 (56536), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 433
Hypertext Transfer Protocol
GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
Upgrade-Insecure-Requests: 1\r\n
User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/45.0.2454.93 Safari/537.36\r\n
Accept-Encoding: gzip, deflate, sdch\r\n
Accept-Language: en-US,en;q=0.8,ms;q=0.6,es;q=0.4\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file3.html]
[HTTP request 1/1]
[Response in frame: 1953]
0000 b8 af 67 63 a3 28 ec a8 6b 76 50 b6 08 00 45 00 ..gc.(.. kvP...E.
0010 01 d9 60 75 40 00 80 06 00 00 0a f5 f7 c9 80 77 .. u@... ....w
0020 f5 0c dc d8 00 50 c1 f4 7b 87 bb 6e 52 b6 50 18 .....P.. {..nR.P.
0030 01 02 7a 0e 00 00 47 45 54 20 2f 77 69 72 65 73 ..z...GE T /wires
0040 68 61 72 6b 2d 6c 61 62 73 2f 48 54 54 50 2d 77 hark-lab s/HTTP-w
0050 69 72 65 73 68 61 72 6b 2d 66 69 6c 65 33 2e 68 ireshark -file3.h
0060 74 6d 6c 20 48 54 54 50 2f 31 2e 31 0d 0a 48 6f tml HTTP /1.1..Ho
0070 73 74 3a 20 67 61 69 61 2e 63 73 2e 75 6d 61 73 st: gaia .cs.umas
0080 73 2e 65 64 75 0d 0a 43 6f 6e 6e 65 63 74 69 6f s.edu..C onnectio
0090 6e 3a 20 6b 65 65 70 2d 61 6c 69 76 65 0d 0a 41 n: keep- alive..A
00a0 63 63 65 70 74 3a 20 74 65 78 74 2f 68 74 6d 6c ccept: t ext/html
00b0 2c 61 70 70 6c 69 63 61 74 69 6f 6e 2f 78 68 74 ,applica tion/xht
00c0 6d 6c 2b 78 6d 6c 2c 61 70 70 6c 69 63 61 74 69 ml+xml,a pplicati
00d0 6f 6e 2f 78 6d 6c 3b 71 3d 30 2e 39 2c 69 6d 61 on/xml;q =0.9,ima
00e0 67 65 2f 77 65 62 70 2c 2a 2f 2a 3b 71 3d 30 2e ge/webp, */*;q=0.
00f0 38 0d 0a 55 70 67 72 61 64 65 2d 49 6e 73 65 63 8..Upgra de-Insec
0100 75 72 65 2d 52 65 71 75 65 73 74 73 3a 20 31 0d ure-Requ ests: 1.
0110 0a 55 73 65 72 2d 41 67 65 6e 74 3a 20 4d 6f 7a .User-Ag ent: Moz
0120 69 6c 6c 61 2f 35 2e 30 20 28 57 69 6e 64 6f 77 illa/5.0 (Window
0130 73 20 4e 54 20 31 30 2e 30 3b 20 57 4f 57 36 34 s NT 10. 0; WOW64
0140 29 20 41 70 70 6c 65 57 65 62 4b 69 74 2f 35 33) AppleW ebKit/53
0150 37 2e 33 36 20 28 4b 48 54 4d 4c 2c 20 6c 69 6b 7.36 (KH TML, lik
0160 65 20 47 65 63 6b 6f 29 20 43 68 72 6f 6d 65 2f e Gecko) Chrome/
0170 34 35 2e 30 2e 32 34 35 34 2e 39 33 20 53 61 66 45.0.245 4.93 Saf
0180 61 72 69 2f 35 33 37 2e 33 36 0d 0a 41 63 63 65 ari/537. 36..Acce
0190 70 74 2d 45 6e 63 6f 64 69 6e 67 3a 20 67 7a 69 pt-Encod ing: gzi
01a0 70 2c 20 64 65 66 6c 61 74 65 2c 20 73 64 63 68 p, defla te, sdch
01b0 0d 0a 41 63 63 65 70 74 2d 4c 61 6e 67 75 61 67 ..Accept -Languag
01c0 65 3a 20 65 6e 2d 55 53 2c 65 6e 3b 71 3d 30 2e e: en-US ,en;q=0.
File: "C:\Users\Aditya\Dropbox\Notes\CSE3... Packets: 2794 · Displayed: 9 (0.3%) · Load time: 0:00.063 Profile: Default



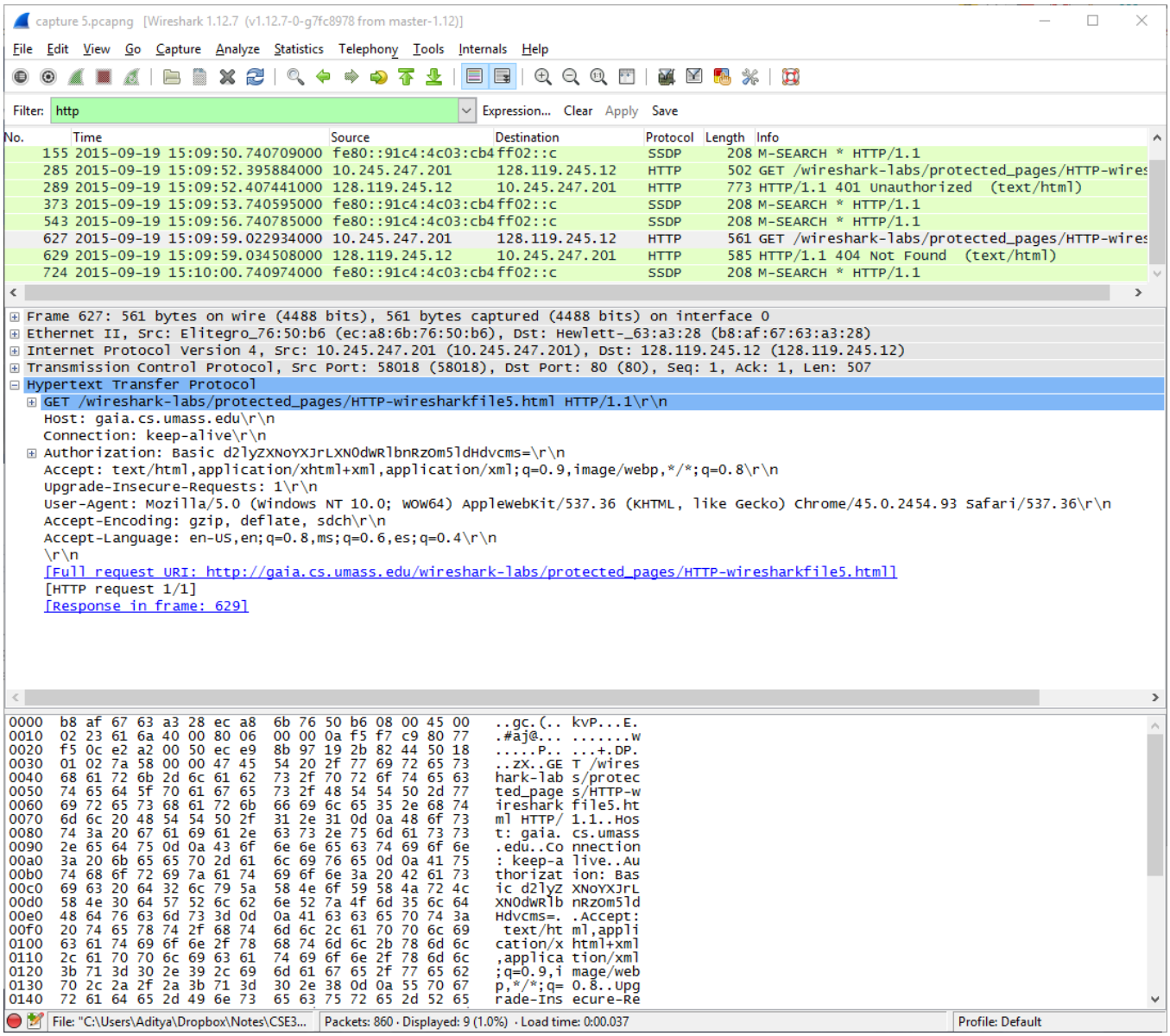
Part 4

1. The browser sent 4 HTTP GET Requests
   1 to 128.119.245.12 for the Wireshark lab webpage
   1 to 165.193.140.14 for the Pearson Logo
   2 to 128.119.240.90 for the cover of the 5th Edition of Computer Networking
2. We can tell whether the browser downloaded the images serially or in parallel by looking at the time of the requests. Since the GET for the second request is sent after the first image is already received, we can say that the images were downloaded serially



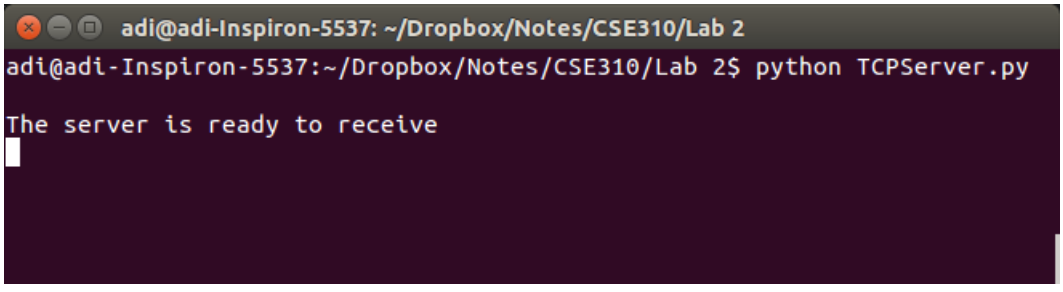
Part 5

1. After the initial request, the server responds with a 401 Unauthorized
2. The second request now contains the "Authorization" field



II. Python client and server

Server



Test Cases