

Wireshark Lab 2 - HTTP

Problem #1

1. **Is your browser running HTTP version 1.0 or 1.1? What version of HTTP is the server running?**
 - My browser is running HTTP version 1.1
 - The server is also running HTTP version 1.1
2. **What languages (if any) does your browser indicate that it can accept to the server?**
 - The language that was given was en-us, en;q=0.50
3. **What is the IP address of your computer? Of the gaia.cs.umass.edu server?**
 - My IP address is 192.168.1.102
 - The server IP address is 128.119.245.12
4. **What is the status code returned from the server to your browser?**
 - The status code returned from the server to my browser is 200
5. **When was the HTML file that you are retrieving last modified at the server?**
 - The HTML was last modified on Tue, 23 Sep 2003 05:29:00 GMT
6. **How many bytes of content are being returned to your browser?**
 - The content being returned to my browser is sized at 73 bytes
7. **By inspecting the raw data in the packet content window, do you see any headers within the data that are not displayed in the packet-listing window? If so, name one.**
 - No, all of the headers are displayed in the packet window

No.	Time	Source	Destination	Protocol	Length	Info
10	4.694850	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-1.html HTTP/1.1

Frame 10: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
 Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
 Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
 Transmission Control Protocol, Src Port: 4127, Dst Port: 80, Seq: 1, Ack: 1, Len: 501
 Hypertext Transfer Protocol
 GET /ethereal-labs/lab2-1.html HTTP/1.1\r\n
 Host: gaia.cs.umass.edu\r\n
 User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
 Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
 Accept-Language: en-us,en;q=0.5\r\n
 Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
 Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
 Keep-Alive: 300\r\n
 Connection: keep-alive\r\n
 \r\n
 [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-1.html]
 [HTTP request 1/2]
 [Response in frame: 12]
 [Next request in frame: 13]

No.	Time	Source	Destination	Protocol	Length	Info
12	4.718993	128.119.245.12	192.168.1.102	HTTP	439	HTTP/1.1 200 OK (text/html)

Frame 12: 439 bytes on wire (3512 bits), 439 bytes captured (3512 bits)
 Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
 Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
 Transmission Control Protocol, Src Port: 80, Dst Port: 4127, Seq: 1, Ack: 502, Len: 385
 Hypertext Transfer Protocol
 HTTP/1.1 200 OK\r\n
 Date: Tue, 23 Sep 2003 05:29:50 GMT\r\n
 Server: Apache/2.0.40 (Red Hat Linux)\r\n
 Last-Modified: Tue, 23 Sep 2003 05:29:00 GMT\r\n
 ETag: "1bfed-49-79d5bf00"\r\n
 Accept-Ranges: bytes\r\n
 Content-Length: 73\r\n
 Keep-Alive: timeout=10, max=100\r\n
 Connection: Keep-Alive\r\n
 Content-Type: text/html; charset=ISO-8859-1\r\n
 \r\n
 [HTTP response 1/2]
 [Time since request: 0.024143000 seconds]
 [Request in frame: 10]
 [Next request in frame: 13]
 [Next response in frame: 14]
 [Request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-1.html]
 File Data: 73 bytes

Line-based text data: text/html (3 lines)

```

<html>\n
  Congratulations. You've downloaded the file lab2-1.html!\n
</html>\n
  
```

Problem #2

8. Inspect the contents of the first HTTP GET request from your browser to the server. Do you see an “IF-MODIFIED-SINCE” line in the HTTP GET?

- No, I do not see the “IF-MODIFIED-SINCE” line

9. Inspect the contents of the server response. Did the server explicitly return the contents of the file? How can you tell?

- Yes, the server did explicitly return the contents of the file because we can look at the bottom of the HTTP Protocol at the **Line-based text data header** which returns the 10 lines of HTML that the file had.

10. Now inspect the contents of the second HTTP GET request from your browser to the server. Do you see an “IF-MODIFIED-SINCE:” line in the HTTP GET? If so, what information follows the “IF-MODIFIED-SINCE:” header?

- Yes, I do see the “**If-Modified-Since**” line in the HTTP Get
- This is the information that follows the header **Tue, 23 Sep 2003 05:35:00 GMT**

11. What is the HTTP status code and phrase returned from the server in response to this second HTTP GET? Did the server explicitly return the contents of the file? Explain.

- The HTTP status code is **304** and the phrase returned from the server is **Not Modified**
- The server did not explicitly return the contents of the file because it does not include the Line-based text data header as well. Also, the meaning of 304 Not Modified means that the file was left exactly as it was and nothing was returned.

No.	Time	Source	Destination	Protocol	Length	Info
8	2.331268	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-2.html HTTP/1.1

Frame 8: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
 Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
 Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
 Transmission Control Protocol, Src Port: 4247, Dst Port: 80, Seq: 1, Ack: 1, Len: 501
 Hypertext Transfer Protocol
 GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n
 Host: gaia.cs.umass.edu\r\n
 User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
 Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
 Accept-Language: en-us, en;q=0.50\r\n
 Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
 Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
 Keep-Alive: 300\r\n
 Connection: keep-alive\r\n
 \r\n
 [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
 [HTTP request 1/2]
 [Response in frame: 10]
 [Next request in frame: 14]

No.	Time	Source	Destination	Protocol	Length	Info
10	2.357902	128.119.245.12	192.168.1.102	HTTP	739	HTTP/1.1 200 OK (text/html)

Frame 10: 739 bytes on wire (5912 bits), 739 bytes captured (5912 bits)
 Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
 Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
 Transmission Control Protocol, Src Port: 80, Dst Port: 4247, Seq: 1, Ack: 502, Len: 685
 Hypertext Transfer Protocol
 HTTP/1.1 200 OK\r\n
 Date: Tue, 23 Sep 2003 05:35:50 GMT\r\n
 Server: Apache/2.0.40 (Red Hat Linux)\r\n
 Last-Modified: Tue, 23 Sep 2003 05:35:00 GMT\r\n
 ETag: "1bfef-173-8f4ae900"\r\n
 Accept-Ranges: bytes\r\n
 Content-Length: 371\r\n
 Keep-Alive: timeout=10, max=100\r\n
 Connection: Keep-Alive\r\n
 Content-Type: text/html; charset=ISO-8859-1\r\n
 \r\n
 [HTTP response 1/2]
 [Time since request: 0.026634000 seconds]
 [Request in frame: 8]
 [Next request in frame: 14]
 [Next response in frame: 15]
 [Request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
 File Data: 371 bytes

Line-based text data: text/html (10 lines)

```

\r\n
<html>\r\n
\r\n
Congratulations again! Now you've downloaded the file lab2-2.html. <br>\r\n
This file's last modification date will not change. <p>\r\n
Thus if you download this multiple times on your browser, a complete copy <br>\r\n
will only be sent once by the server due to the inclusion of the IN-MODIFIED-SINCE<br>\r\n
field in your browser's HTTP GET request to the server.\r\n
\r\n
</html>\r\n

```

No.	Time	Source	Destination	Protocol	Length	Info
14	5.517390	192.168.1.102	128.119.245.12	HTTP	668	GET /ethereal-labs/lab2-2.html HTTP/1.1

Frame 14: 668 bytes on wire (5344 bits), 668 bytes captured (5344 bits)
 Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
 Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
 Transmission Control Protocol, Src Port: 4247, Dst Port: 80, Seq: 502, Ack: 686, Len: 614
 Hypertext Transfer Protocol
 GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n
 Host: gaia.cs.umass.edu\r\n
 User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
 Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
 Accept-Language: en-us, en;q=0.50\r\n
 Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
 Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
 Keep-Alive: 300\r\n
 Connection: keep-alive\r\n
 If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT\r\n
 If-None-Match: "1bfef-173-8f4ae900"\r\n
 Cache-Control: max-age=0\r\n
 \r\n
 [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
 [HTTP request 2/2]
 [Prev request in frame: 8]
 [Response in frame: 15]

No.	Time	Source	Destination	Protocol	Length	Info
15	5.540216	128.119.245.12	192.168.1.102	HTTP	243	HTTP/1.1 304 Not Modified

Frame 15: 243 bytes on wire (1944 bits), 243 bytes captured (1944 bits)
 Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)

```
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
Transmission Control Protocol, Src Port: 80, Dst Port: 4247, Seq: 686, Ack: 1116, Len: 189
Hypertext Transfer Protocol
  HTTP/1.1 304 Not Modified\r\n
    Date: Tue, 23 Sep 2003 05:35:53 GMT\r\n
    Server: Apache/2.0.40 (Red Hat Linux)\r\n
    Connection: Keep-Alive\r\n
    Keep-Alive: timeout=10, max=99\r\n
    ETag: "1bfef-173-8f4ae900"\r\n
    \r\n
    [HTTP response 2/2]
    [Time since request: 0.022826000 seconds]
    [Prev request in frame: 8]
    [Prev response in frame: 10]
    [Request in frame: 14]
    [Request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
```

Problem #3

12. How many HTTP GET request messages did your browser send? Which packet number in the trace contains the GET message for the Bill of Rights?

- My browser only sent **one** HTTP GET request message
- The packet number is **8**

```
No.      Time         Source           Destination      Protocol Length Info
  8      4.623732    192.168.1.102    128.119.245.12  HTTP      555    GET /ethereal-labs/lab2-3.html HTTP/1.1
Frame 8: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 4272, Dst Port: 80, Seq: 1, Ack: 1, Len: 501
Hypertext Transfer Protocol
  GET /ethereal-labs/lab2-3.html HTTP/1.1\r\n
  Host: gaia.cs.umass.edu\r\n
  User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
  Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
  Accept-Language: en-us,en;q=0.50\r\n
  Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
  Accept-Charset: ISO-8859-1, utf-8;q=0.66,*/*;q=0.66\r\n
  Keep-Alive: 300\r\n
  Connection: keep-alive\r\n
  \r\n
[Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-3.html]
[HTTP request 1/1]
[Response in frame: 14]
```

13. Which packet number in the trace contains the status code and phrase associated with the response to the HTTP GET request?

- The packet number that contains the status code and phrase is **261**

No.	Time	Source	Destination	Protocol	Length	Info
8	4.623732	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-3.html HTTP/1.1
14	4.680920	128.119.245.12	192.168.1.102	HTTP	490	HTTP/1.1 200 OK (text/html)

> Frame 14: 490 bytes on wire (3920 bits), 490 bytes captured (3920 bits)	0000	48 54 54 50 2f 11 2e 31 20 32 30 30 20 4f 4b 0d	HTTP/1.1 200 OK
> Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)	0010	0a 44 61 74 65 3a 20 54 75 65 2c 20 32 33 20 53	Date: Tue, 23 Sep 2003 05:37:02 GMT
> Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102	0020	65 70 20 32 30 30 33 20 30 35 3a 33 37 3a 30 32	Server: Apache/2.0.40 (Red Hat Linux)
> Transmission Control Protocol, Src Port: 80, Dst Port: 4272, Seq: 4381, Ack: 502, Len: 436	0030	20 47 4d 54 0d 0a 53 65 72 76 65 72 3a 20 41 70	Content-Length: 4500
> [4 Reassembled TCP Segments (4816 bytes): #10(1460), #11(1460), #13(1460), #14(436)]	0040	31 63 68 65 2f 32 2e 30 28 3a 30 20 28 52 65 6d	Keep-Alive: timeout=10, max=100
> [Frame: 10, payload: 8-1459 (1460 bytes)]	0050	20 43 61 74 20 4c 69 6e 75 78 29 0d 0a 4c 61 72	Connection: keep-alive
> [Frame: 11, payload: 1460-2919 (1460 bytes)]	0060	74 2d 4d 6f 64 69 66 69 65 64 3a 20 54 75 65 2c	
> [Frame: 13, payload: 2920-4379 (1460 bytes)]	0070	20 32 33 20 53 65 70 20 32 30 30 33 20 30 35 3a	
> [Frame: 14, payload: 4380-4815 (436 bytes)]	0080	33 37 3a 30 31 20 47 4d 54 0d 0a 45 54 61 67 3a	
> [Segment count: 4]	0090	20 22 31 62 66 66 32 2d 31 31 39 3a 2d 39 36 38	
> [Reassembled TCP length: 4816]	00a0	11 33 39 3a 30 22 0d 0a 41 63 63 65 70 74 2d 52	
> [Reassembled TCP Data: 485454502f312e3120323030204f4b0d0a446174653a205475652c203233205365702032-]	00b0	61 6e 67 65 73 3a 20 62 79 74 65 73 0d 0a 43 6f	
> Hypertext Transfer Protocol	00c0	6e 74 65 6e 74 2d 4c 65 6e 67 74 68 3a 20 34 35	
> HTTP/1.1 200 OK\r\n	00d0	30 30 0d 0a 4b 65 65 70 2d 41 6c 69 76 65 3a 20	
Date: Tue, 23 Sep 2003 05:37:02 GMT\r\n	00e0	74 69 6d 65 6f 75 74 3d 31 30 2c 20 6d 61 78 3d	
Server: Apache/2.0.40 (Red Hat Linux)\r\n	00f0	11 30 30 0d 0a 43 6f 6e 6e 63 74 69 6f 6e 3a	
Last-Modified: Tue, 23 Sep 2003 05:37:01 GMT\r\n	0100	20 4b 65 65 70 2d 41 6c 69 76 65 0d 0a 43 6f 6e	
ETag: "1bf2-1194-96813940"\r\n	0110	74 65 6e 74 2d 54 79 70 65 3a 20 74 65 78 74 2f	
Accept-Ranges: bytes\r\n	0120	68 74 6d 6c 3b 20 63 68 61 72 73 65 74 3d 49 53	
Content-Length: 4500\r\n	0130	4f 2d 38 38 35 39 2d 31 0d 0a 0d 0a 3c 68 74 6d	
Keep-Alive: timeout=10, max=100\r\n	0140	0c 3e 3c 68 65 61 64 3e 20 0a 3c 74 69 74 6d	
Connection: keep-alive\r\n	0150	3e 4b 69 73 74 6f 72 69 63 61 6c 20 44 6f 63 75	
Content-Type: text/html; charset=ISO-8859-1\r\n	0160	6d 65 6e 74 73 3a 54 48 45 20 42 49 4c 20 4f 4f	
\r\n	0170	46 20 52 49 47 48 54 53 3c 2f 74 69 74 6c 6e 3a	
[HTTP response 1/1]	0180	3c 2f 68 65 61 64 3e 0a 0a 3c 62 6f 64 79 20	
	0190	02 67 63 6f 6c 6f 72 3d 22 23 66 66 66 66 66	
	01a0	22 20 6c 69 6e 6b 3d 22 23 33 33 30 30 30 22	

14. What is the status code and phrase in the response?

- The status code is **200** and the response phrase is **OK**

15. How many data-containing TCP segments were needed to carry the single HTTP response and the text of the Bill of Rights?

- We need 4 data-containing TCP segments to carry out one HTTP response. Those packet numbers are 10, 11, 13, and 14

```
No.      Time          Source            Destination      Protocol Length Info
  14  4.680920      128.119.245.12    192.168.1.102    HTTP           490    HTTP/1.1 200 OK (text/html)
Frame 14: 490 bytes on wire (3920 bits), 490 bytes captured (3920 bits)
Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
Transmission Control Protocol, Src Port: 80, Dst Port: 4272, Seq: 4381, Ack: 502, Len: 436
4 Reassembled TCP Segments (4816 bytes): #10(1460), #11(1460), #13(1460), #14(436)
Hypertext Transfer Protocol
HTTP/1.1 200 OK\r\n
Date: Tue, 23 Sep 2003 05:37:02 GMT\r\n
Server: Apache/2.0.40 (Red Hat Linux)\r\n
Last-Modified: Tue, 23 Sep 2003 05:37:01 GMT\r\n
ETag: "1bff2-1194-96813940"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 4500\r\n
Keep-Alive: timeout=10, max=100\r\n
Connection: Keep-Alive\r\n
Content-Type: text/html; charset=ISO-8859-1\r\n
\r\n
[HTTP response 1/1]
[Time since request: 0.057188000 seconds]
[Request in frame: 8]
[Request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-3.html]
File Data: 4500 bytes
Line-based text data: text/html (98 lines)
```

Problem #4

16. How many HTTP GET request messages did your browser send? To which Internet addresses were these GET requests sent?

- There were 3 HTTP GET request messages that my browser sent
- One was sent to the 128.119.245.12 IP Address (this was to the main webpage)
- One was sent to the 165.193.123.218 IP Address (this was the gif)
- One was sent to the 134.241.6.82 IP Address (this was the jpg)

17. Can you tell whether your browser downloaded the two images serially, or whether they were downloaded from the two web sites in parallel? Explain.

- I can tell that these two images were downloaded in parallel because both of the HTTP GET requests for the images are occurring before we receive anything back from the server. Also, the times of the HTTP GET requests are really close in time while the responses are in the future. Therefore, these images are downloaded from the two websites in parallel.

10 7.236929	192.168.1.102	128.119.245.12	HTTP	555 GET /ethereal-labs/lab2-4.html HTTP/1.1
12 7.260813	128.119.245.12	192.168.1.102	HTTP	1057 HTTP/1.1 200 OK (text/html)
17 7.305485	192.168.1.102	165.193.123.218	HTTP	625 GET /catalog/images/pearson-logo-footer.gif HTTP/1.1
20 7.308803	192.168.1.102	134.241.6.82	HTTP	609 GET /~kurose/cover.jpg HTTP/1.1
25 7.333054	165.193.123.218	192.168.1.102	HTTP	912 HTTP/1.1 200 OK (GIF89a)
54 7.589877	134.241.6.82	192.168.1.102	HTTP	1096 HTTP/1.0 200 Document follows (JPEG JFIF image)

Problem #5

18. What is the server's response (status code and phrase) in response to the initial HTTP GET message from your browser?

- The server's response in the form of a status code is **401** and the phrase is **Authorization Required**.

```
> Frame 9: 278 bytes on wire (2224 bits), 278 bytes captured (2224 bits)
> Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
> Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
> Transmission Control Protocol, Src Port: 80, Dst Port: 4335, Seq: 1461, Ack: 518, Len: 224
√ [2 Reassembled TCP Segments (1684 bytes): #8(1460), #9(224)]
  [Frame: 8, payload: 0-1459 (1460 bytes)]
  [Frame: 9, payload: 1460-1683 (224 bytes)]
  [Segment count: 2]
  [Reassembled TCP length: 1684]
  [Reassembled TCP Data: 485454502f312e312034303120417574686f72697a617469666e2052657175697265640d...]
√ Hypertext Transfer Protocol
  > HTTP/1.1 401 Authorization Required\r\n
    > [Expert Info (Chat/Sequence): HTTP/1.1 401 Authorization Required\r\n]
      Response Version: HTTP/1.1
      Status Code: 401
      [Status Code Description: Unauthorized]
      Response Phrase: Authorization Required
      Date: Tue, 23 Sep 2003 05:39:58 GMT\r\n
      Server: Apache/2.0.40 (Red Hat Linux)\r\n
      WWW-Authenticate: Basic realm="eth-students only"\r\n
      Vary: accept-language\r\n
      Accept-Ranges: bytes\r\n
    > Content-Length: 1349\r\n
      Keep-Alive: timeout=10, max=100\r\n
      Connection: Keep-Alive\r\n
      Content-Type: text/html; charset=ISO-8859-1\r\n
```

19. When your browser's sends the HTTP GET message for the second time, what new field is included in the HTTP GET message?

- In the second HTTP GET message, the new field that was included was **Authorization: Basic ZXRoLXN0dWRlbnRzOm5ldHdvcmtz**

```
> Frame 65: 622 bytes on wire (4976 bits), 622 bytes captured (4976 bits)
> Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
> Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
> Transmission Control Protocol, Src Port: 4342, Dst Port: 80, Seq: 1, Ack: 1, Len: 568
√ Hypertext Transfer Protocol
  > GET /ethereal-labs/protected_pages/lab2-5.html HTTP/1.1\r\n
    > [Expert Info (Chat/Sequence): GET /ethereal-labs/protected_pages/lab2-5.html HTTP/1.1\r\n]
      Request Method: GET
      Request URI: /ethereal-labs/protected_pages/lab2-5.html
      Request Version: HTTP/1.1
      Host: gaia.cs.umass.edu\r\n
      User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
      Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text
      Accept-Language: en-us,en;q=0.50\r\n
      Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
      Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
      Keep-Alive: 300\r\n
      Connection: keep-alive\r\n
    > Authorization: Basic ZXRoLXN0dWRlbnRzOm5ldHdvcmtz\r\n
      \r\n
      [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/protected_pages/lab2-5.html]
      [HTTP request 1/1]
      [Response in frame: 68]
```