Had to use the precaptured files because my wireshark was not working.

1. Is your browser running HTTP version 1.0 or 1.1? What version of HTTP is the server running?

- Both are running 1.1

```
GET /favicon.ico HTTP/1.1\r\n
    Request Method: GET
    Request URI: /favicon.ico
    Request Version: HTTP/1.1
Host: gaia.cs.umass.edu\r\n
```

```
Protocol Length Info
HTTP     541    GET /favicon.ico HTTP/1.1
```

2. What languages (if any) does your browser indicate that it can accept to the server?

- English

```
Accept-Language: en-us, en;q=0.50\r\n
Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
```

3. What is the IP address of your computer? Of the gaia.cs.umass.edu server?

```
Source
192.168.1.102
```

- Mine:

```
Destination
128.119.245.12
```

4. What is the status code returned from the server to your browser?

```
[Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-1.html]
    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)
```

5. When was the HTML file that you are retrieving last modified at the server?

```
    Time
10 4.694850
```

6. How many bytes of content are being returned to your browser?

```
[Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-1.html]
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: Packet, 439 bytes on wire (3512 bits), 439 bytes captured (3512 bits)
```

```
Frame Length: 439 bytes (3512 bits)
Capture Length: 439 bytes (3512 bits)
```

```
Last-Modified: Tue, 23 Sep 2003 05:29:00 GM
ETag: "1bfed-49-79d5bf00"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 73\r\n
```

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.

- None

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

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

- No because of the Not modified

```
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
        Response Version: HTTP/1.1
```

```
Accept-Ranges: bytes\r\n
Content-Length: 371\r\n
    [Content length: 371]
Keep-Alive: timeout=10, max=100\r\n
Connection: Keep-Alive\r\n
```

```
    File Data: 371 bytes
Line-based text data: text/html (10 lines)
    \n
    <html>\n
```

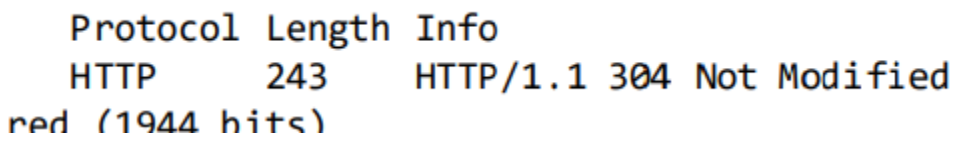
10. Now inspect the contents of the second HTTP GET request from your browser to the server. Do you see an “IF-MODIFIED-SINCE:” line in the HTTP GET? If so, what information follows the “IF-MODIFIED-SINCE:” header?

- Yes

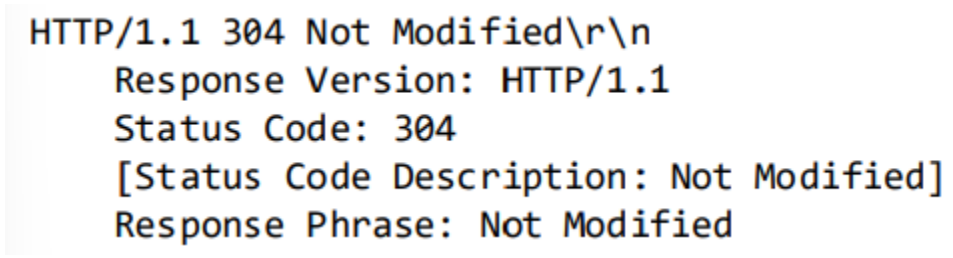
```
If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT\r\n
If-None-Match: "1bfef-173-8f4ae900"\r\n
Cache-Control: max-age=0\r\n
\r\n
[Response in frame: 15]
[Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
```

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.

- 304 not modified →The server did not return the contents of the file. It confirmed it was the same file rather than sending the entire file again.

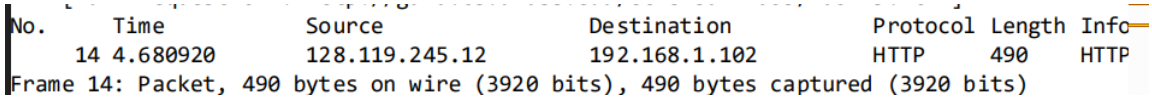


- red (1944 bits)



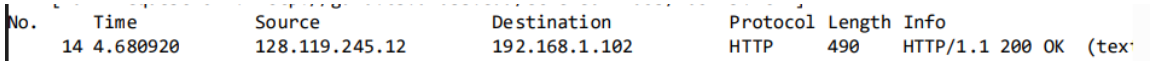
12. How many HTTP GET request messages did your browser send? Which packet number in the trace contains the GET message for the Bill or Rights?

- 1 GET request
- 14



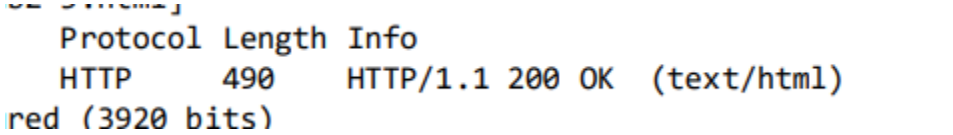
13. Which packet number in the trace contains the status code and phrase associated with the response to the HTTP GET request?

- Packet 14



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

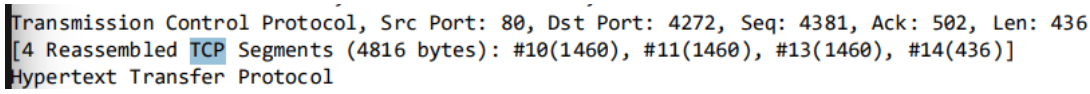
- 200



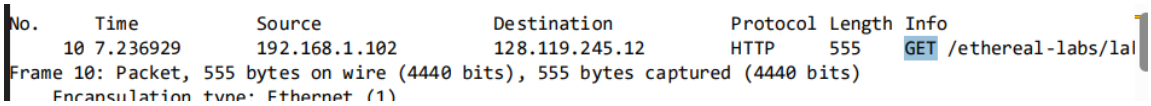
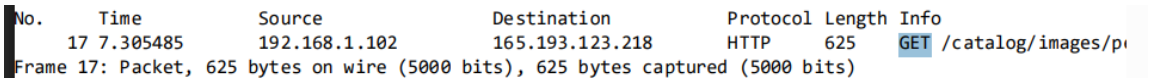
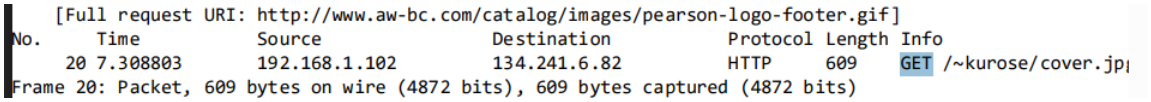
- red (3920 bits)

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

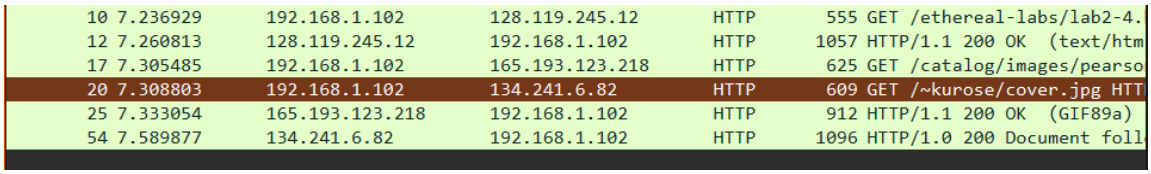
- 4



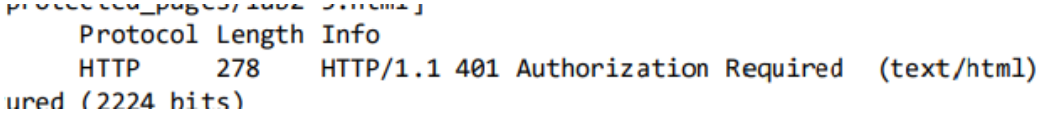
16. How many HTTP GET request messages did your browser send? To which Internet addresses were these GET requests sent?

- 3
- 
```
No.     Time           Source                Destination           Protocol Length Info
     10 7.236929       192.168.1.102         128.119.245.12        HTTP     555    GET /ethereal-labs/lal
Frame 10: Packet, 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
    Encapsulation type: Ethernet (1)
```
- 
```
No.     Time           Source                Destination           Protocol Length Info
     17 7.305485       192.168.1.102         165.193.123.218       HTTP     625    GET /catalog/images/p
Frame 17: Packet, 625 bytes on wire (5000 bits), 625 bytes captured (5000 bits)
```
- 
```
    [Full request URI: http://www.aw-bc.com/catalog/images/pearson-logo-footer.gif]
No.     Time           Source                Destination           Protocol Length Info
     20 7.308803       192.168.1.102         134.241.6.82          HTTP     609    GET /~kurose/cover.jp
Frame 20: Packet, 609 bytes on wire (4872 bits), 609 bytes captured (4872 bits)
```
- 128.119.245.12
- 165.193.123.218
- 134.241.6.82

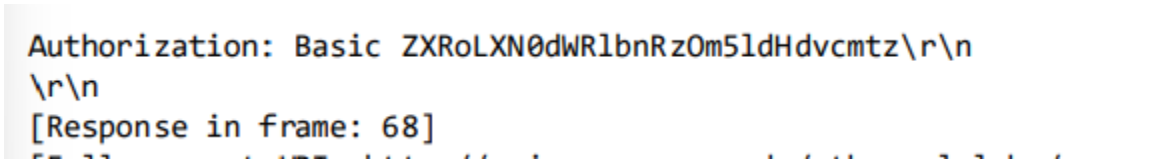
17. Can you tell whether your browser downloaded the two images serially, or whether they were downloaded from the two web sites in parallel? Explain.

- Mine is parallel because 2 GET requests get sent without waiting on the server
- 
```
     10 7.236929    192.168.1.102    128.119.245.12    HTTP     555 GET /ethereal-labs/lab2-4.
     12 7.260813    128.119.245.12   192.168.1.102     HTTP    1057 HTTP/1.1 200 OK  (text/htm
     17 7.305485    192.168.1.102    165.193.123.218   HTTP     625 GET /catalog/images/pearso
     20 7.308803    192.168.1.102    134.241.6.82      HTTP     609 GET /~kurose/cover.jpg HTT
     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 foll
```

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

- Authorization Required 401
- 
```
Protocol Length Info
HTTP     278    HTTP/1.1 401 Authorization Required  (text/html)
```
- ured (2224 bits)

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

- Authorization
- 
```
Authorization: Basic ZXRoLXN0dWRlbnRzOm5ldHdvcmtz\r\n
\r\n
[Response in frame: 68]
```