Rhea Mae Edwards
CS 372 Lab #2

The Basic HTTP GET/response interaction

HTTP GET Message:

```
    145 17:20:45.823862    172.17.104.228       128.119.245.12       HTTP     581    GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1
Frame 145: 581 bytes on wire (4648 bits), 581 bytes captured (4648 bits) on interface 0
Ethernet II, Src: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2), Dst: 02:81:83:11:02:05 (02:81:83:11:02:05)
Internet Protocol Version 4, Src: 172.17.104.228, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 61957 (61957), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 527
Hypertext Transfer Protocol
    GET /wireshark-labs/HTTP-wireshark-file1.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
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.103 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
    Accept-Encoding: gzip, deflate, sdch\r\n
    Accept-Language: en-US,en;q=0.8\r\n
    If-None-Match: "80-536b4ea95956a"\r\n
    If-Modified-Since: Sun, 03 Jul 2016 05:59:01 GMT\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]
    [HTTP request 1/1]
    [Response in frame: 147]
```

HTTP Response Message:

```
     33 14:48:12.593680    128.119.245.12       192.168.0.102        HTTP     542    HTTP/1.1 200 OK  (text/html)
Frame 33: 542 bytes on wire (4336 bits), 542 bytes captured (4336 bits) on interface 0
Ethernet II, Src: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c), Dst: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 62856 (62856), Seq: 1, Ack: 417, Len: 488
Hypertext Transfer Protocol
    HTTP/1.1 200 OK\r\n
    Date: Mon, 04 Jul 2016 21:48:10 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: Mon, 04 Jul 2016 05:59:01 GMT\r\n
    ETag: "80-536c908741110"\r\n
    Accept-Ranges: bytes\r\n
    Content-Length: 128\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 1/1]
    [Time since request: 0.090432000 seconds]
    [Request in frame: 31]
Line-based text data: text/html
```

1. My browser is running on HTTP version 1.1

```
GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n
```

The server is also running on HTTP version 1.1

```
HTTP/1.1 200 OK  (text/html)
```

2. Accepted Language(s): English (U.S.)

```
Accept-Language: en-US,en;q=0.8\r\n
```

3. IP Address of My Computer: 172.17.104.228

```
Src: 172.17.104.228
```

IP Address of the gaia.cs.umass.eud Server: 128.119.245.12

```
Dst: 128.119.245.12
```

4. The status code returned from the server to my browser was 200

```
200 OK
```

5. The HTTML file I was retrieving was last modified at the server on Monday, July 4th, 2016 at 12:20AM

```
Mon, 04 Jul 2016 00:20:43
```

6. 295 bytes of content was being returned to my browser

```
295 bytes
```

7. No data that I notice.

The HTTP CONDITIONAL GET/response interaction

First HTTP GET Request

```
     38 14:11:03.488654    192.168.0.102         128.119.245.12        HTTP     470    GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
Frame 38: 470 bytes on wire (3760 bits), 470 bytes captured (3760 bits) on interface 0
Ethernet II, Src: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2), Dst: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c)
Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 62656 (62656), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 416
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
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.103 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
    Accept-Encoding: gzip, deflate, sdch\r\n
    Accept-Language: en-US,en;q=0.8\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: 40]
    [Next request in frame: 52]
```

First Server Response

```
     40 14:11:03.577194    128.119.245.12        192.168.0.102         HTTP     786    HTTP/1.1 200 OK  (text/html)
Frame 40: 786 bytes on wire (6288 bits), 786 bytes captured (6288 bits) on interface 0
Ethernet II, Src: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c), Dst: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 62656 (62656), Seq: 1, Ack: 417, Len: 732
Hypertext Transfer Protocol
    HTTP/1.1 200 OK\r\n
    Date: Mon, 04 Jul 2016 21:11:00 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: Mon, 04 Jul 2016 05:59:01 GMT\r\n
    ETag: "173-536c908740940"\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: 0.088540000 seconds]
    [Request in frame: 38]
    [Next request in frame: 52]
    [Next response in frame: 53]
Line-based text data: text/html
```

Second HTTP GET Request

```
     52 14:11:05.236498    192.168.0.102        128.119.245.12        HTTP     582    GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
Frame 52: 582 bytes on wire (4656 bits), 582 bytes captured (4656 bits) on interface 0
Ethernet II, Src: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2), Dst: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c)
Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 62656 (62656), Dst Port: 80 (80), Seq: 417, Ack: 733, Len: 528
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
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.103 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
    Accept-Encoding: gzip, deflate, sdch\r\n
    Accept-Language: en-US,en;q=0.8\r\n
    If-None-Match: "173-536c908740940"\r\n
    If-Modified-Since: Mon, 04 Jul 2016 05:59:01 GMT\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
    [HTTP request 2/2]
    [Prev request in frame: 38]
    [Response in frame: 53]
```

Second Server Response

```
     53 14:11:05.325531    128.119.245.12        192.168.0.102         HTTP     295    HTTP/1.1 304 Not Modified
Frame 53: 295 bytes on wire (2360 bits), 295 bytes captured (2360 bits) on interface 0
Ethernet II, Src: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c), Dst: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 62656 (62656), Seq: 733, Ack: 945, Len: 241
Hypertext Transfer Protocol
    HTTP/1.1 304 Not Modified\r\n
    Date: Mon, 04 Jul 2016 21:11:02 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
    Connection: Keep-Alive\r\n
    Keep-Alive: timeout=5, max=99\r\n
    ETag: "173-536c908740940"\r\n
    \r\n
    [HTTP response 2/2]
    [Time since request: 0.089033000 seconds]
    [Prev request in frame: 38]
    [Prev response in frame: 40]
    [Request in frame: 52]
```

8. I <u>do not</u> see an “IF-MODIFIED-SINCE:” line in the first HTTP GET request.

```
     38 14:11:03.488654    192.168.0.102        128.119.245.12        HTTP     470    GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
Frame 38: 470 bytes on wire (3760 bits), 470 bytes captured (3760 bits) on interface 0
Ethernet II, Src: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2), Dst: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c)
Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 62656 (62656), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 416
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
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.103 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
    Accept-Encoding: gzip, deflate, sdch\r\n
    Accept-Language: en-US,en;q=0.8\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: 40]
    [Next request in frame: 52]
```

9. Yes, the server explicitly retuned the contents of the file. I can tell because there is a line-based text data section displayed within the response stating a fresh download completion of the contents of the file as shown below.

```
Line-based text data: text/html
    \n
    <html>\n
    \n
    Congratulations again!  Now you've downloaded the file lab2-2.html. <br>\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 <br>\n
    will only be sent once by the server due to the inclusion of the IN-MODIFIED-SINCE<br>\n
    field in your browser's HTTP GET request to the server.\n
    \n
    </html>\n
```

10. Yes, I do see an "IF-MODIDIED-SINCE:" line in the second HTTP GET request.
    Information Followed: Mon, 04 Jul 2016 05:59:01 GMT\r\n

```
If-Modified-Since: Mon, 04 Jul 2016 05:59:01 GMT\r\n
```

11. The HTTP status code and phrase returned from the server in response to this second HTTP GET is 304 Not Modified
    Since the file was not modified, the server explicitly did not return the contents of the file.

```
     53 14:11:05.325531    128.119.245.12        192.168.0.102         HTTP     295    HTTP/1.1 304 Not Modified
Frame 53: 295 bytes on wire (2360 bits), 295 bytes captured (2360 bits) on interface 0
Ethernet II, Src: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c), Dst: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 62656 (62656), Seq: 733, Ack: 945, Len: 241
Hypertext Transfer Protocol
    HTTP/1.1 304 Not Modified\r\n
    Date: Mon, 04 Jul 2016 21:11:02 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
    Connection: Keep-Alive\r\n
    Keep-Alive: timeout=5, max=99\r\n
    ETag: "173-536c908740940"\r\n
    \r\n
    [HTTP response 2/2]
    [Time since request: 0.089033000 seconds]
    [Prev request in frame: 38]
    [Prev response in frame: 40]
    [Request in frame: 52]
```

Retrieving Long Documents

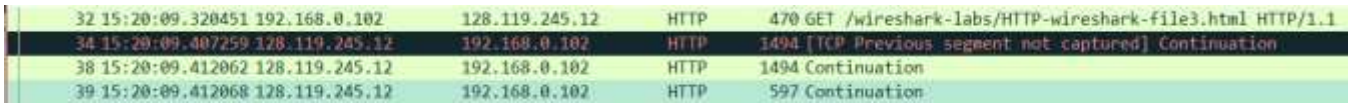
12. 1 HTTP GET request messages was sent by my browser.

```
    32 15:20:09.320451 192.168.0.102      128.119.245.12      HTTP     470 GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1
    34 15:20:09.407259 128.119.245.12     192.168.0.102       HTTP    1494 [TCP Previous segment not captured] Continuation
    38 15:20:09.412062 128.119.245.12     192.168.0.102       HTTP    1494 Continuation
    39 15:20:09.412068 128.119.245.12     192.168.0.102       HTTP     597 Continuation
```

Packet Number 32 in the trace contains the GET message for the Bill of Rights.

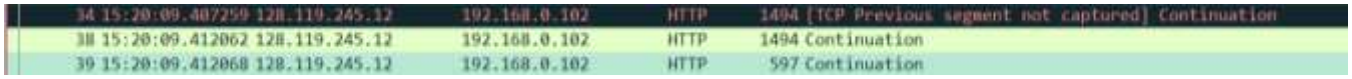
```
    32 15:20:09.320451 192.168.0.102      128.119.245.12      HTTP     470 GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1
```

13. I was unable to find a pack that contained the status code and phrase associated with the response to the HTTP GET response. But I would assume it would have be the response packet immediately following the HTTP GET message, which would have been packet number 34.



14. The potential status code and phrase in the response could have been 200 and OK.

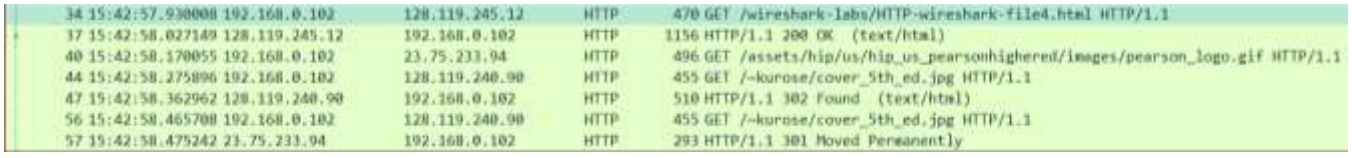
15. 3 data-containing TCP segments were needed to carry the single HTTP response and the text of the Bill of Rights. Packet Numbers 34, 38, and 39



HTML Documents with Embedded Objects

16. 4 HTTP GET request messages were sent by my browser.

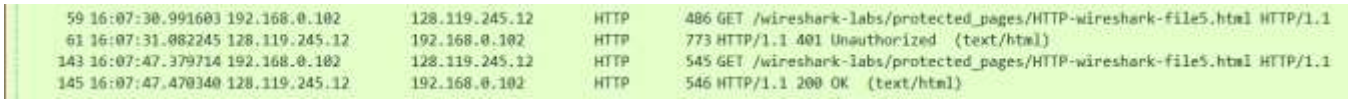
    One to 128.119.245.12, one to 23.75.233.94, and two to 128.119.240.90

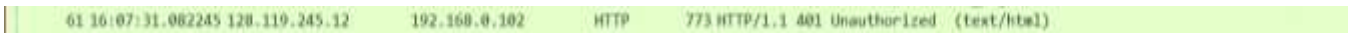


17. I am unable to tell whether my browser downloaded the two images serially or in parallel.
    But I would assume that my browser downloaded the images from the two web sites in parallel, because the second image had went through two HTTP GET request messages in the trace, which leads me to assume that the two images with initially called in parallel, yet something occurred while analyzing the second image causing for second GET afterwards.

HTTP Authentication

18. The server's response in response to the initial HTP GET message from my browser is
    401 Unauthorized





19. Authorization: Basic is the new field that is included in the second HTTP GET message.

```
    143 16:07:47.379714    192.168.0.102         128.119.245.12        HTTP     545    GET /wireshark-labs/protected_pages/HTTP-wireshark-
file5.html HTTP/1.1
Frame 143: 545 bytes on wire (4360 bits), 545 bytes captured (4360 bits) on interface 0
Ethernet II, Src: IntelCor_1c:96:a2 (5c:51:4f:1c:96:a2), Dst: Tp-LinkT_93:d0:8c (14:cc:20:93:d0:8c)
Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 63018 (63018), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 491
Hypertext Transfer Protocol
    GET /wireshark-labs/protected_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n
    Host: gaia.cs.umass.edu\r\n
    Connection: keep-alive\r\n
    Authorization: Basic d2lyZXNoYXJrLXN0dWRlbnRzOm5ldHdvcms=\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/51.0.2704.103 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n
    Accept-Encoding: gzip, deflate, sdch\r\n
    Accept-Language: en-US,en;q=0.8\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/protected_pages/HTTP-wireshark-file5.html]
    [HTTP request 1/1]
    [Response in frame: 145]
```