Wireshark Lab: HTTP

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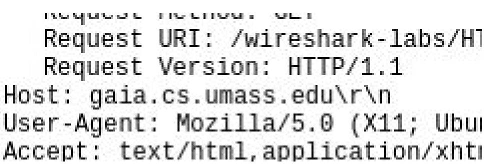
Descrição: Atividade realizada para o aprofundamento do conhecimento do protocolo HTTP. Foram desenvolvidas 5 partes, cada uma com um foco diferente. Cada seção representa uma parte e dentro de cada uma existem capturas de telas para as respostas da questões levantadas nas seções. Nem todo o conteúdo exibido na tela do Wireshark foi documentado, apenas o conteúdo pertinente as respostas.

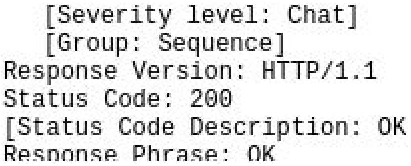
1. The Basic HTTP GET/response interaction

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

Tanto o browser cliente quanto o servidor rodam a versão 1.1 do protocolo. Isso pode ser verificado nos itens Request Version e Response Version.



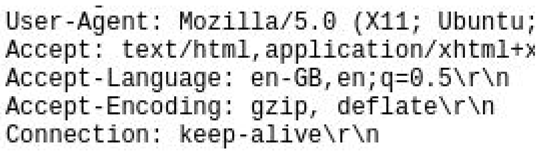
```
   Request Method: GET
   Request URI: /wireshark-labs/HT
   Request Version: HTTP/1.1
Host: gaia.cs.umass.edu\r\n
User-Agent: Mozilla/5.0 (X11; Ubu
Accept: text/html,application/xht
```



```
   [Severity level: Chat]
   [Group: Sequence]
Response Version: HTTP/1.1
Status Code: 200
[Status Code Description: OK
Response Phrase: OK
```

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

En-GB é aceito, conforme o item Accept-Language.

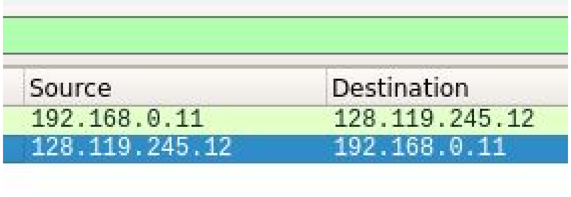


```
User-Agent: Mozilla/5.0 (X11; Ubuntu;
Accept: text/html,application/xhtml+x
Accept-Language: en-GB,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
```

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

Conforme as colunas Source e Destination:

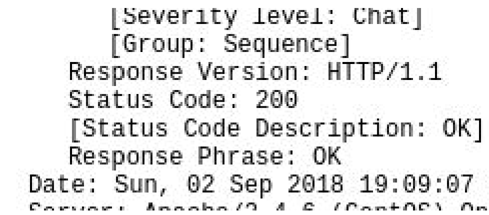
- Minha máquina: 192.168.0.11
- Servidor: 128.119.245.12



Source	Destination
192.168.0.11	128.119.245.12
128.119.245.12	192.168.0.11

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

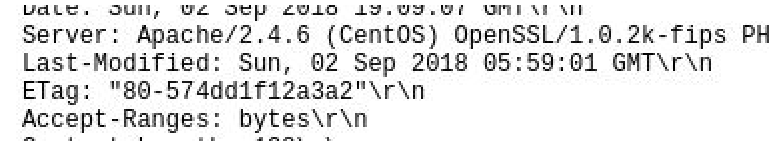
200 Ok, conforme o item Status Code.



```
        [Severity level: Chat]
        [Group: Sequence]
     Response Version: HTTP/1.1
     Status Code: 200
     [Status Code Description: OK]
     Response Phrase: OK
  Date: Sun, 02 Sep 2018 19:09:07 (
```

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

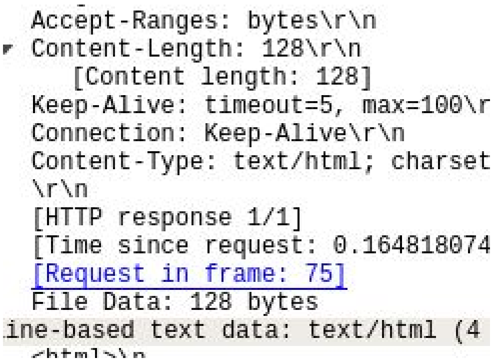
Em 2 de Setembro de 2018 às 05:59:01, conforme o item Last-Modified.



```
 Date: Sun, 02 Sep 2018 19:09:07 GMT\r\n
 Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PH
 Last-Modified: Sun, 02 Sep 2018 05:59:01 GMT\r\n
 ETag: "80-574dd1f12a3a2"\r\n
 Accept-Ranges: bytes\r\n
```

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

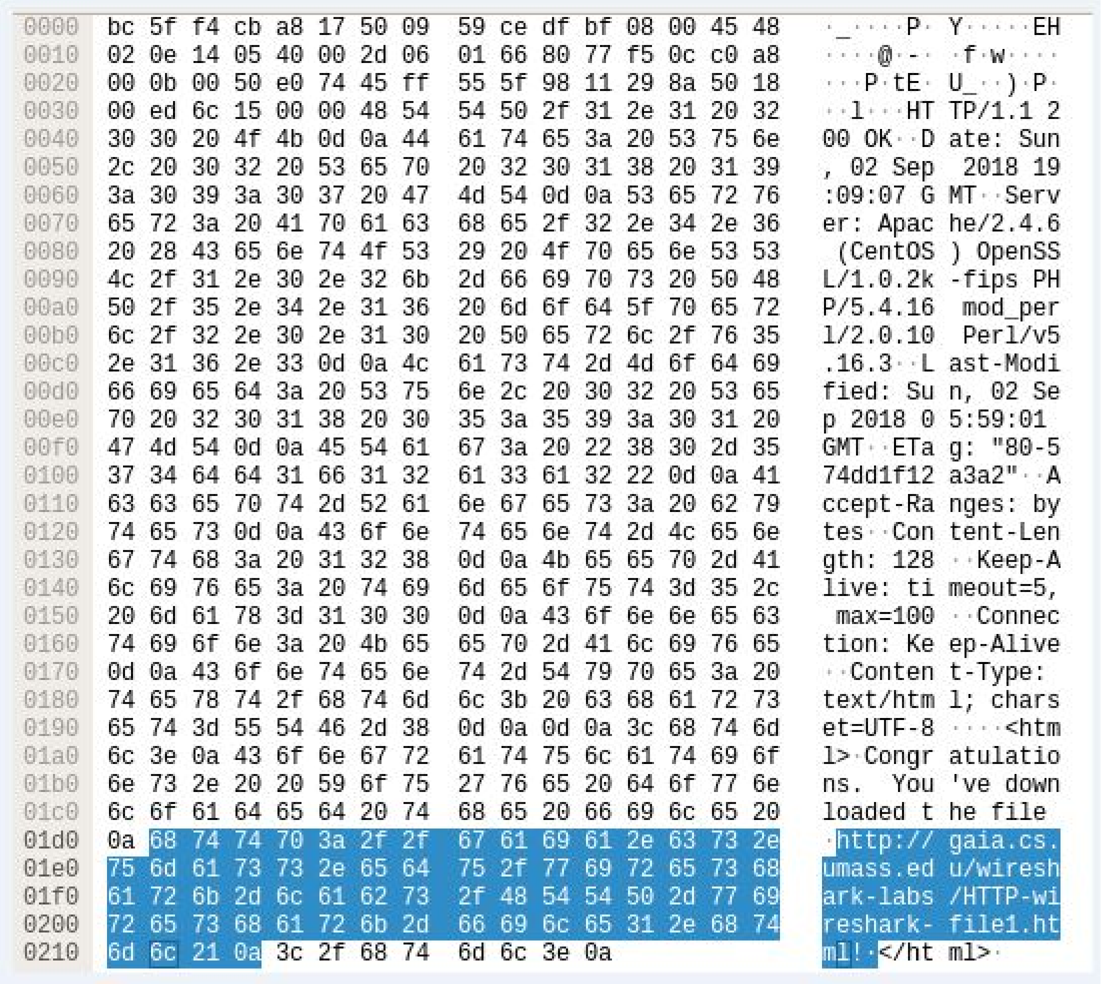
128 bytes, conforme o item File Data.



```
  Accept-Ranges: bytes\r\n
▾ Content-Length: 128\r\n
     [Content length: 128]
  Keep-Alive: timeout=5, max=100\r
  Connection: Keep-Alive\r\n
  Content-Type: text/html; charset
  \r\n
  [HTTP response 1/1]
  [Time since request: 0.164818074
  [Request in frame: 75]
  File Data: 128 bytes
ine-based text data: text/html (4
```

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.

Não.

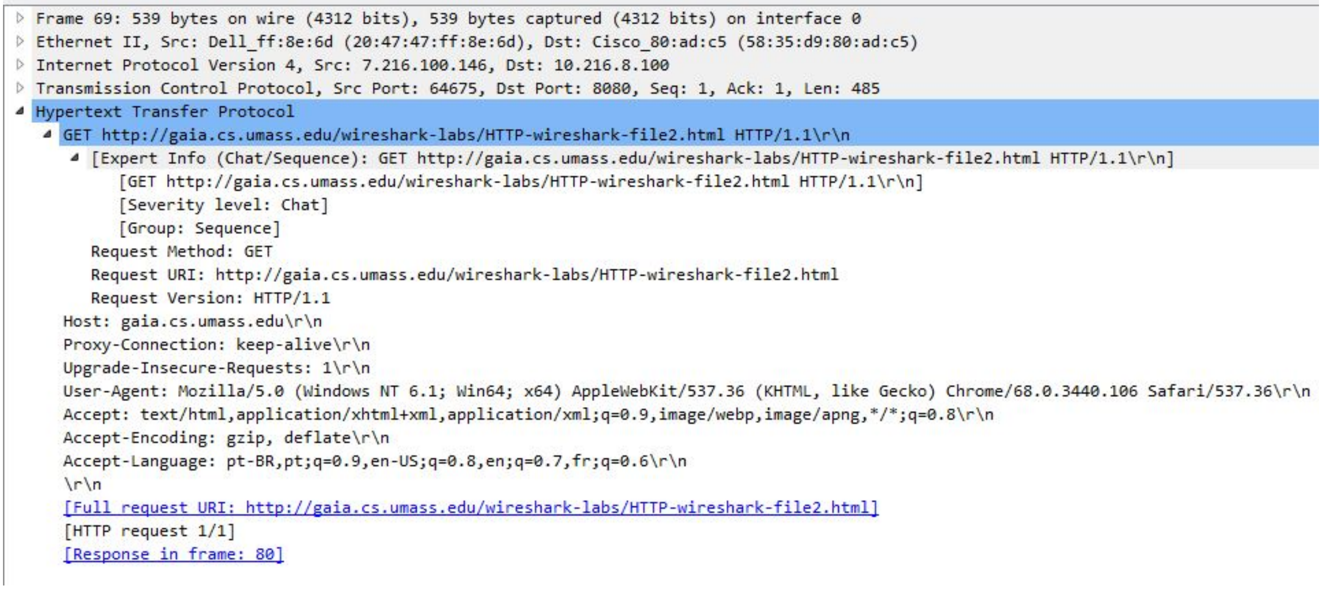


```
0000  bc 5f f4 cb a8 17 50 09  59 ce df bf 08 00 45 48   ·_····P· Y·····EH
0010  02 0e 14 05 40 00 2d 06  01 66 80 77 f5 0c c0 a8   ····@·-· ·f·w····
0020  00 0b 00 50 e0 74 45 ff  55 5f 98 11 29 8a 50 18   ···P·tE· U_··)·P·
0030  00 ed 6c 15 00 00 48 54  54 50 2f 31 2e 31 20 32   ··l···HT TP/1.1 2
0040  30 30 20 4f 4b 0d 0a 44  61 74 65 3a 20 53 75 6e   00 OK··D ate: Sun
0050  2c 20 30 32 20 53 65 70  20 32 30 31 38 20 31 39   , 02 Sep  2018 19
0060  3a 30 39 3a 30 37 20 47  4d 54 0d 0a 53 65 72 76   :09:07 G MT··Serv
0070  65 72 3a 20 41 70 61 63  68 65 2f 32 2e 34 2e 36   er: Apac he/2.4.6
0080  20 28 43 65 6e 74 4f 53  29 20 4f 70 65 6e 53 53    (CentOS ) OpenSS
0090  4c 2f 31 2e 30 2e 32 6b  2d 66 69 70 73 20 50 48   L/1.0.2k -fips PH
00a0  50 2f 35 2e 34 2e 31 36  20 6d 6f 64 5f 70 65 72   P/5.4.16  mod_per
00b0  6c 2f 32 2e 30 2e 31 30  20 50 65 72 6c 2f 76 35   l/2.0.10  Perl/v5
00c0  2e 31 36 2e 33 0d 0a 4c  61 73 74 2d 4d 6f 64 69   .16.3··L ast-Modi
00d0  66 69 65 64 3a 20 53 75  6e 2c 20 30 32 20 53 65   fied: Su n, 02 Se
00e0  70 20 32 30 31 38 20 30  35 3a 35 39 3a 30 31 20   p 2018 0 5:59:01 
00f0  47 4d 54 0d 0a 45 54 61  67 3a 20 22 38 30 2d 35   GMT··ETa g: "80-5
0100  37 34 64 64 31 66 31 32  61 33 61 32 22 0d 0a 41   74dd1f12 a3a2"··A
0110  63 63 65 70 74 2d 52 61  6e 67 65 73 3a 20 62 79   ccept-Ra nges: by
0120  74 65 73 0d 0a 43 6f 6e  74 65 6e 74 2d 4c 65 6e   tes··Con tent-Len
0130  67 74 68 3a 20 31 32 38  0d 0a 4b 65 65 70 2d 41   gth: 128 ··Keep-A
0140  6c 69 76 65 3a 20 74 69  6d 65 6f 75 74 3d 35 2c   live: ti meout=5,
0150  20 6d 61 78 3d 31 30 30  0d 0a 43 6f 6e 6e 65 63    max=100 ··Connec
0160  74 69 6f 6e 3a 20 4b 65  65 70 2d 41 6c 69 76 65   tion: Ke ep-Alive
0170  0d 0a 43 6f 6e 74 65 6e  74 2d 54 79 70 65 3a 20   ··Conten t-Type: 
0180  74 65 78 74 2f 68 74 6d  6c 3b 20 63 68 61 72 73   text/htm l; chars
0190  65 74 3d 55 54 46 2d 38  0d 0a 0d 0a 3c 68 74 6d   et=UTF-8 ····<htm
01a0  6c 3e 0a 43 6f 6e 67 72  61 74 75 6c 61 74 69 6f   l>·Congr atulatio
01b0  6e 73 2e 20 20 59 6f 75  27 76 65 20 64 6f 77 6e   ns.  You 've down
01c0  6c 6f 61 64 65 64 20 74  68 65 20 66 69 6c 65 20   loaded t he file 
01d0  0a 68 74 74 70 3a 2f 2f  67 61 69 61 2e 63 73 2e   ·http:// gaia.cs.
01e0  75 6d 61 73 73 2e 65 64  75 2f 77 69 72 65 73 68   umass.ed u/wiresh
01f0  61 72 6b 2d 6c 61 62 73  2f 48 54 54 50 2d 77 69   ark-labs /HTTP-wi
0200  72 65 73 68 61 72 6b 2d  66 69 6c 65 31 2e 68 74   reshark- file1.ht
0210  6d 6c 21 0a 3c 2f 68 74  6d 6c 3e 0a               ml!·</ht ml>·
```

2. The HTTP CONDITIONAL GET/response interaction

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?

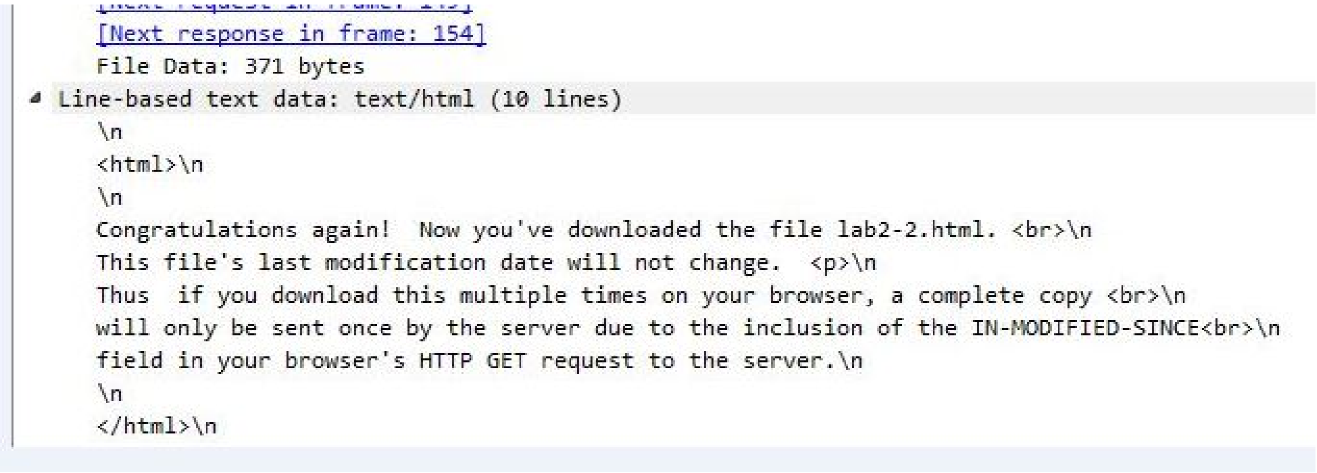
Esta linha não existe no primeiro GET.



```
▷ Frame 69: 539 bytes on wire (4312 bits), 539 bytes captured (4312 bits) on interface 0
▷ Ethernet II, Src: Dell_ff:8e:6d (20:47:47:ff:8e:6d), Dst: Cisco_80:ad:c5 (58:35:d9:80:ad:c5)
▷ Internet Protocol Version 4, Src: 7.216.100.146, Dst: 10.216.8.100
▷ Transmission Control Protocol, Src Port: 64675, Dst Port: 8080, Seq: 1, Ack: 1, Len: 485
◢ Hypertext Transfer Protocol
  ◢ GET http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
    ◢ [Expert Info (Chat/Sequence): GET http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n]
        [GET http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
      Request Method: GET
      Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html
      Request Version: HTTP/1.1
    Host: gaia.cs.umass.edu\r\n
    Proxy-Connection: keep-alive\r\n
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/68.0.3440.106 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: pt-BR,pt;q=0.9,en-US;q=0.8,en;q=0.7,fr;q=0.6\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: 80]
```

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

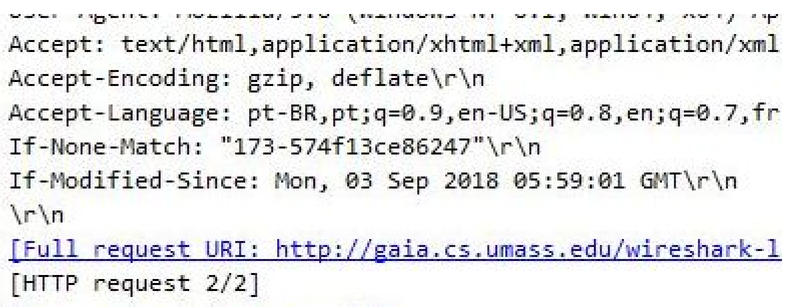
Sim, pois é possível expandir o item Line-based text data: text/html (10 lines) e obter o conteúdo da página.



```
      [Next response in frame: 154]
      File Data: 371 bytes
◢ Line-based text data: text/html (10 lines)
      \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. 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?

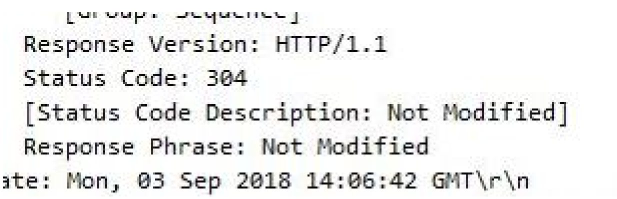
Sim, o contéudo deste item é: Mon, 03 Sep 2018 05:59:01 GMT.



```
User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) Ap
Accept: text/html,application/xhtml+xml,application/xml
Accept-Encoding: gzip, deflate\r\n
Accept-Language: pt-BR,pt;q=0.9,en-US;q=0.8,en;q=0.7,fr
If-None-Match: "173-574f13ce86247"\r\n
If-Modified-Since: Mon, 03 Sep 2018 05:59:01 GMT\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/wireshark-l
[HTTP request 2/2]
```

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.

O status retornado é o 304 - Not Modified. O servidor não retornou o conteúdo novamente. Este fato ocorre pois o conteúdo da página não foi modificado desde o último carregamento. Isso faz com que seja desnecessário reenviar os conteúdos novamente, uma vez que o browser já está exibindo o conteúdo presente no servidor. Isso otimiza e descongestiona a rede, uma vez que conteúdos redundantes não são reenviados desnecessariamente.



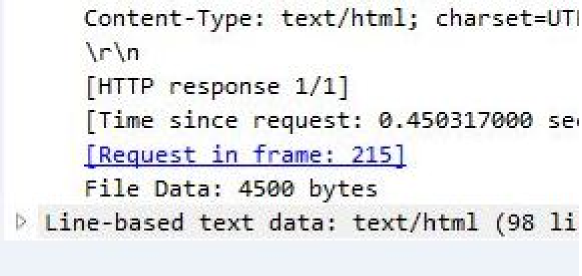
```
    [Group: Sequence]
 Response Version: HTTP/1.1
 Status Code: 304
 [Status Code Description: Not Modified]
 Response Phrase: Not Modified
ate: Mon, 03 Sep 2018 14:06:42 GMT\r\n
```

---

3. Retrieving Long Documents

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?

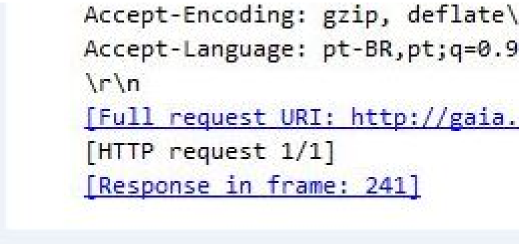
Apenas 1 GET foi enviado. O pacote 215, conforme item [Request in frame: 215]



```
     Content-Type: text/html; charset=UT
     \r\n
     [HTTP response 1/1]
     [Time since request: 0.450317000 se
     [Request in frame: 215]
     File Data: 4500 bytes
  ▷ Line-based text data: text/html (98 li
```

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

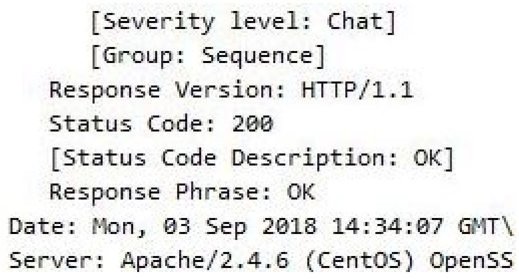
O pacote 241, conforme item [Response in frame: 241]



```
     Accept-Encoding: gzip, deflate\
     Accept-Language: pt-BR,pt;q=0.9
     \r\n
     [Full request URI: http://gaia.
     [HTTP request 1/1]
     [Response in frame: 241]
```

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

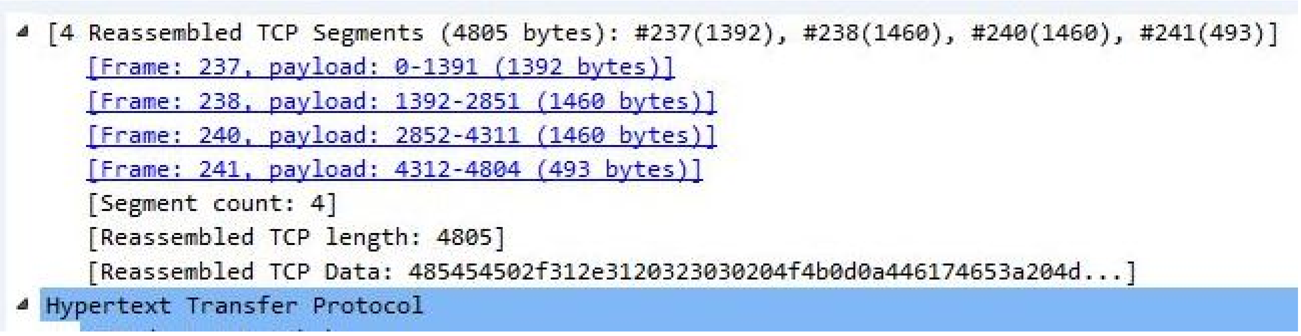
200 - OK, conforme itens Status Code: 200 e Response Phrase: OK.



```
      [Severity level: Chat]
      [Group: Sequence]
   Response Version: HTTP/1.1
   Status Code: 200
   [Status Code Description: OK]
   Response Phrase: OK
Date: Mon, 03 Sep 2018 14:34:07 GMT\
Server: Apache/2.4.6 (CentOS) OpenSS
```

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

4 segmentos foram necessários, conforme item Segment count.

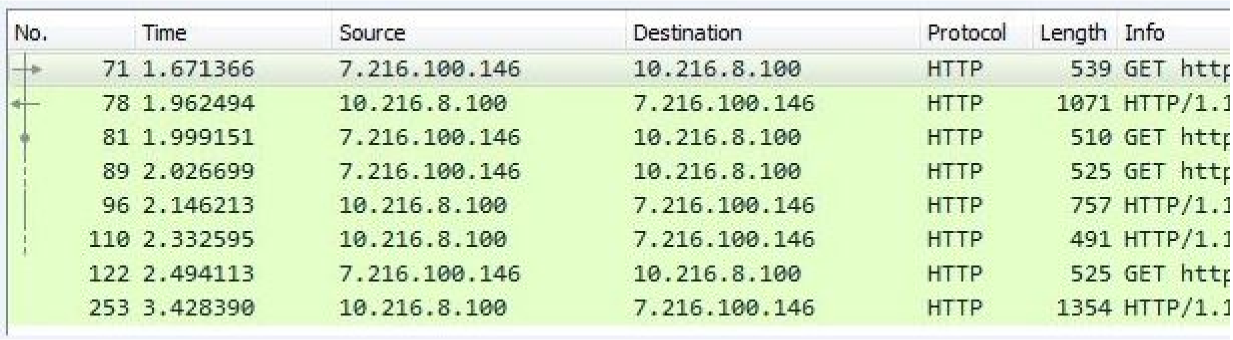


```
◢ [4 Reassembled TCP Segments (4805 bytes): #237(1392), #238(1460), #240(1460), #241(493)]
     [Frame: 237, payload: 0-1391 (1392 bytes)]
     [Frame: 238, payload: 1392-2851 (1460 bytes)]
     [Frame: 240, payload: 2852-4311 (1460 bytes)]
     [Frame: 241, payload: 4312-4804 (493 bytes)]
     [Segment count: 4]
     [Reassembled TCP length: 4805]
     [Reassembled TCP Data: 485454502f312e3120323030204f4b0d0a446174653a204d...]
◢ Hypertext Transfer Protocol
```

4. HTML Documents with Embedded Objects

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

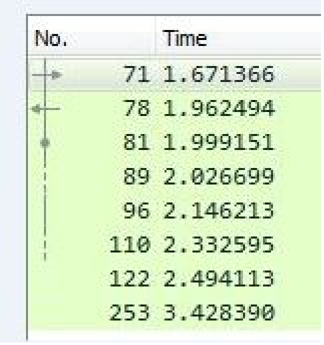
4 requisições GET foram enviadas. O endereço foi 10.216.8.100



No.	Time	Source	Destination	Protocol	Length	Info
71	1.671366	7.216.100.146	10.216.8.100	HTTP	539	GET http
78	1.962494	10.216.8.100	7.216.100.146	HTTP	1071	HTTP/1.1
81	1.999151	7.216.100.146	10.216.8.100	HTTP	510	GET http
89	2.026699	7.216.100.146	10.216.8.100	HTTP	525	GET http
96	2.146213	10.216.8.100	7.216.100.146	HTTP	757	HTTP/1.1
110	2.332595	10.216.8.100	7.216.100.146	HTTP	491	HTTP/1.1
122	2.494113	7.216.100.146	10.216.8.100	HTTP	525	GET http
253	3.428390	10.216.8.100	7.216.100.146	HTTP	1354	HTTP/1.1

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.

Analisando os tempos, é possível perceber que os downloads foram em paralelo, pois o download da primeira imagem foi solicitado no tempo 1.999151 e finalizado no tempo 2.146213. Enquanto isso, o download da segunda imagem foi solicitado no tempo 2.026699 e finalizado no tempo 3.428390, pois a segunda imagem mudou de localização e por isso foi feito um quarto GET para o real endereço da imagem, uma vez que o terceiro retornou a nova localização desta.

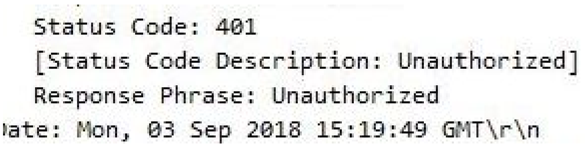


```
No.   Time
 71 1.671366
 78 1.962494
 81 1.999151
 89 2.026699
 96 2.146213
110 2.332595
122 2.494113
253 3.428390
```

5 HTTP Authentication

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

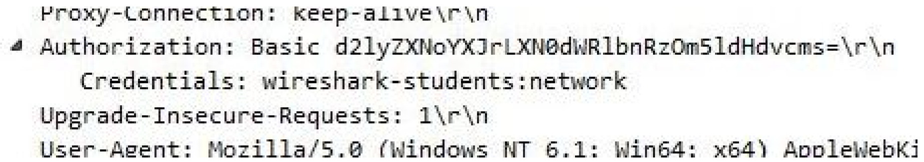
401 - Unauthorized, conforme os itens Status Code e Status Response.



```
  Status Code: 401
  [Status Code Description: Unauthorized]
  Response Phrase: Unauthorized
)ate: Mon, 03 Sep 2018 15:19:49 GMT\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?

O novo campo incluído é o Authorization, que contém as credenciais de autenticação.



```
  Proxy-Connection: keep-alive\r\n
◢ Authorization: Basic d2lyZXNoYXJrLXN0dWRlbnRzOm5ldHdvcms=\r\n
     Credentials: wireshark-students:network
  Upgrade-Insecure-Requests: 1\r\n
  User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKi
```