

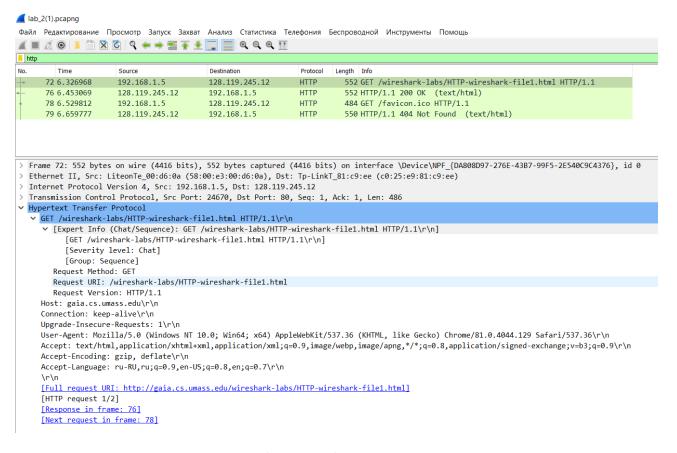
Завдання лабораторної роботи №2 З дисципліни «Комп'ютерні мережі»

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Возняк В. 3.

Прийняв: Кухарєв С.О.



Hypertext Transfer Protocol (request)

```
GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-
file1.html HTTP/1.1\r\n]
            [GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Request Method: GET
        Request URI: /wireshark-labs/HTTP-wireshark-file1.html
        Request Version: HTTP/1.1
    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;
                                                            Win64;
                                                                       x64)
AppleWebKit/537.36
                       (KHTML,
                                  like
                                           Gecko)
                                                      Chrome/81.0.4044.129
Safari/537.36\r\n
    Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/ap
ng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    \r\n
```

```
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-
wireshark-file1.html]
  [HTTP request 1/2]
  [Response in frame: 76]
  [Next request in frame: 78]
```

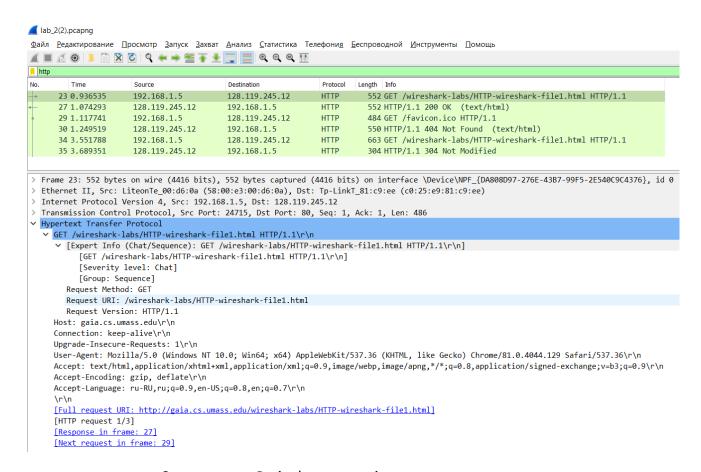
Hypertext Transfer Protocol (response)

```
HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
            [HTTP/1.1 200 OK\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
    Date: Fri, 01 May 2020 14:24:52 GMT\r\n
             Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16
    Server:
mod perl/2.0.11 Perl/v5.16.3\r\n
    Last-Modified: Fri, 01 May 2020 05:59:02 GMT\r\n
    ETag: "80-5a48fe0c9953e"\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 1/2]
    [Time since request: 0.126101000 seconds]
    [Request in frame: 72]
    [Next request in frame: 78]
    [Next response in frame: 79]
    [Request URI: http://gaia.cs.umass.edu/favicon.ico]
    File Data: 128 bytes
```

ВІДПОВІДІ НА ПИТАННЯ 1-7

- 1) HTTP 1.1. Навряд чи зараз ще використвується 1.0, оскільки 1.1 було розроблено саме для того, щоб можна було встановити постійне з'єднання в рамках якого посилалося б більше одного запиту-відповіді.
- 2) Для цього дивимося в заголовок пакета запиту Accept-Language. Мови перечислюються в порядку пріоритетності. В нашому випадку такими є російська, англійська (американська) та англійська (британська).

- 3) IP мого пк Source: 192.168.1.5. Серверу Destination: 128.119.245.12.
- 4) Status Code: 200. Означає успішний запит.
- 5) Last-Modified: Fri, 01 May 2020 05:59:02 GMT
- 6) Content-Length: 128. Розмір вказується в байтах.
- 7) У пакеті на запит все відповідає байтовому представленню. У пакетівідповіді все також відповідає байтовому представленню.



<u>Hypertext Transfer Protocol (1st request)</u>

```
GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-
file1.html HTTP/1.1\r\n]
        [GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
        Request Method: GET
        Request URI: /wireshark-labs/HTTP-wireshark-file1.html
        Request Version: HTTP/1.1
    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;
                                                            Win64;
                                                                     x64)
AppleWebKit/537.36
                       (KHTML,
                                  like
                                           Gecko)
                                                      Chrome/81.0.4044.129
Safari/537.36\r\n
    Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/ap
ng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    \r\n
    [Full
           request
                     URI:
                            http://gaia.cs.umass.edu/wireshark-labs/HTTP-
wireshark-file1.html]
    [HTTP request 1/3]
    [Response in frame: 27]
    [Next request in frame: 29]
Hypertext Transfer Protocol (1st response)
    HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
            [HTTP/1.1 200 OK\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
    Date: Fri, 01 May 2020 14:29:34 GMT\r\n
              Apache/2.4.6
                              (CentOS)
                                         OpenSSL/1.0.2k-fips
    Server:
                                                                PHP/5.4.16
mod_perl/2.0.11 Perl/v5.16.3\r\n
    Last-Modified: Fri, 01 May 2020 05:59:02 GMT\r\n
    ETag: "80-5a48fe0c9953e"\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 1/3]
    [Time since request: 0.137758000 seconds]
    [Request in frame: 23]
    [Next request in frame: 29]
    [Next response in frame: 30]
    [Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-
file1.html]
    File Data: 128 bytes
```

Hypertext Transfer Protocol (3d request)

Connection: Keep-Alive\r\n

```
GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-
file1.html HTTP/1.1\r\n]
            [GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Request Method: GET
        Request URI: /wireshark-labs/HTTP-wireshark-file1.html
        Request Version: HTTP/1.1
    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
                  Mozilla/5.0
    User-Agent:
                                 (Windows
                                             NT
                                                   10.0;
                                                            Win64;
                                                                     x64)
AppleWebKit/537.36
                      (KHTML,
                                  like
                                          Gecko)
                                                     Chrome/81.0.4044.129
Safari/537.36\r\n
    Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/ap
ng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    If-None-Match: "80-5a48fe0c9953e"\r\n
    If-Modified-Since: Fri, 01 May 2020 05:59:02 GMT\r\n
    \r\n
    [Full
           request
                     URI:
                            http://gaia.cs.umass.edu/wireshark-labs/HTTP-
wireshark-file1.html]
    [HTTP request 3/3]
    [Prev request in frame: 29]
    [Response in frame: 35]
Hypertext Transfer Protocol (3d responce)
    HTTP/1.1 304 Not Modified\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 304 Not Modified\r\n]
            [HTTP/1.1 304 Not Modified\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Response Version: HTTP/1.1
        Status Code: 304
        [Status Code Description: Not Modified]
        Response Phrase: Not Modified
    Date: Fri, 01 May 2020 14:29:37 GMT\r\n
    Server:
              Apache/2.4.6
                             (CentOS)
                                         OpenSSL/1.0.2k-fips PHP/5.4.16
mod per1/2.0.11 Per1/v5.16.3\r\n
```

```
Keep-Alive: timeout=5, max=98\r\n
ETag: "80-5a48fe0c9953e"\r\n
\r\n
[HTTP response 3/3]
[Time since request: 0.137563000 seconds]
[Prev request in frame: 29]
[Prev response in frame: 30]
[Request in frame: 34]
[Request URI: <a href="http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html">http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html</a>]
```

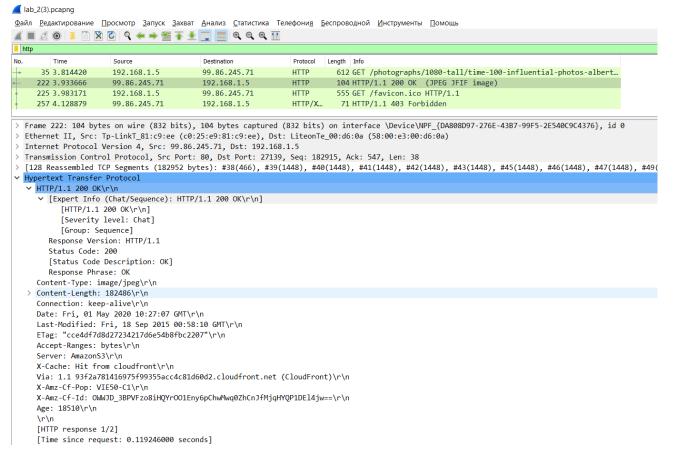
ВІДПОВІДІ НА ПИТАННЯ 8-11

- 8) У першому запиті заголовок IF-MODIFIED-SINCE відсутній.
- 9) Так, повернув html:

<html>\n

Congratulations. You've downloaded the file \n http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html!\n </html>\n

- 10) Так, є. Значення 3-го GET запиту для If-Modified-Since співпадає зі значенням 1-го response Last-Modified: Fri, 01 May 2020 05:59:02 GMT.
- 11) У третю відповідь сервер не вертав уже файл. Він повернув код 304, який відповідає статусу, що файл не був змінений. Таким чином спрацював механізм кешування в браузері. Оскільки сторінка не була змінена з часу останнього завантаження, то не було потреби додатково навантажувати мережу і заново її передавати.



Hypertext Transfer Protocol (1st request)

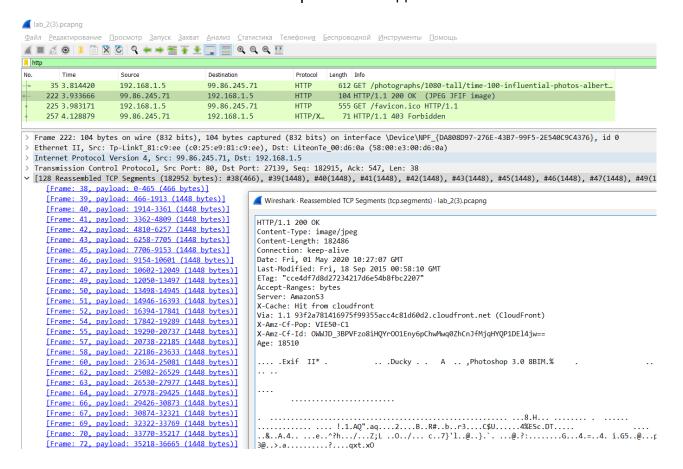
```
GET /photographs/1080-tall/time-100-influential-photos-alberto-korda-
guerillero-heroico-48.jpg HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /photographs/1080-tall/time-100-
influential-photos-alberto-korda-guerillero-heroico-48.jpg HTTP/1.1\r\n]
            [GET
                       /photographs/1080-tall/time-100-influential-photos-
alberto-korda-guerillero-heroico-48.jpg HTTP/1.1\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Request Method: GET
        Request URI: /photographs/1080-tall/time-100-influential-photos-
alberto-korda-guerillero-heroico-48.jpg
        Request Version: HTTP/1.1
    Host: dujye7n3e5wjl.cloudfront.net\r\n
    Connection: keep-alive\r\n
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent:
                   Mozilla/5.0
                                  (Windows
                                              NT
                                                    10.0;
                                                             Win64;
                                                                       x64)
AppleWebKit/537.36
                       (KHTML,
                                   like
                                           Gecko)
                                                      Chrome/81.0.4044.129
Safari/537.36\r\n
    Accept:
text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/ap
```

ng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9\r\n

```
Accept-Encoding: gzip, deflate\r\n
    Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    \r\n
    [Full
                                    request
                                                                       URI:
http://dujye7n3e5wjl.cloudfront.net/photographs/1080-tall/time-100-
influential-photos-alberto-korda-guerillero-heroico-48.jpg]
    [HTTP request 1/2]
    [Response in frame: 222]
    [Next request in frame: 225]
Hypertext Transfer Protocol (1st response)
    HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
            [HTTP/1.1 200 OK\r\n]
            [Severity level: Chat]
            [Group: Sequence]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
    Content-Type: image/jpeg\r\n
    Content-Length: 182486\r\n
    Connection: keep-alive\r\n
    Date: Fri, 01 May 2020 10:27:07 GMT\r\n
    Last-Modified: Fri, 18 Sep 2015 00:58:10 GMT\r\n
    ETag: "cce4df7d8d27234217d6e54b8fbc2207"\r\n
    Accept-Ranges: bytes\r\n
    Server: AmazonS3\r\n
    X-Cache: Hit from cloudfront\r\n
    Via:
                1.1
                           93f2a781416975f99355acc4c81d60d2.cloudfront.net
(CloudFront)\r\n
    X-Amz-Cf-Pop: VIE50-C1\r\n
    X-Amz-Cf-Id:
OWWJD 3BPVFzo8iHQYrOO1Eny6pChwMwq0ZhCnJfMjqHYQP1DEl4jw==\r\n
    Age: 18510\r\n
    \r\n
    [HTTP response 1/2]
    [Time since request: 0.119246000 seconds]
    [Request in frame: 35]
    [Next request in frame: 225]
    [Next response in frame: 257]
    [Request URI: http://dujye7n3e5wjl.cloudfront.net/favicon.ico]
    File Data: 182486 bytes
```

ВІДПОВІДІ НА ПИТАННЯ 12-15

- 12) Було 2 GET запити.
- 13) Для доставки малюнка необхідно було 128 TCP пакети (41 Reassembled TCP Segments)
- 14) Code: 200, Description: OK.
- 15) Так, зустрічалися у першому файлі, якщо клікнути по ньому ПКМ і вибрати «Показать Байты Пакета». Скріншот наводиться:

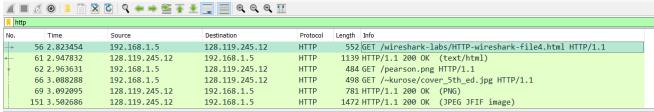


ВІДПОВІДІ НА ПИТАННЯ 16-17

- 16) Усього було 3 GET запити, один на завантаження HTML сторінки і два на завантаження малюнків. Цільова адреса серверу 128.119.245.12, моя адреса 192.168.1.5.
- 17) Ресурси були отримані паралельно. Про це вказує часова послідовність запитів, де спочатку йдуть два GET запити на завантаження малюнків і аж потім ідуть запити-відповіді сервера.



<u>Ф</u>айл <u>Р</u>едактирование <u>П</u>росмотр <u>З</u>апуск <u>З</u>ахват <u>А</u>нализ <u>С</u>татистика Телефони<u>я</u> <u>Б</u>еспроводной <u>И</u>нструменты <u>П</u>омощь



- > Frame 56: 552 bytes on wire (4416 bits), 552 bytes captured (4416 bits) on interface \Device\NPF_{DA808D97-276E-43B7-99F5-2E540C9C4376}, id 0
- > Ethernet II, Src: LiteonTe_00:d6:0a (58:00:e3:00:d6:0a), Dst: Tp-LinkT_81:c9:ee (c0:25:e9:81:c9:ee)
- > Internet Protocol Version 4, Src: 192.168.1.5, Dst: 128.119.245.12
- > Transmission Control Protocol, Src Port: 26587, Dst Port: 80, Seq: 1, Ack: 1, Len: 486
- → Hypertext Transfer Protocol
 - ✓ GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1\r\n
 - > [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1\r\n]

Request Method: GET

 $Request\ URI:\ /wireshark-labs/HTTP-wireshark-file4.html$

Request Version: HTTP/1.1 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; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/81.0.4044.129 Safari/537.36\r\n Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/appg,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9\r\n

Accept-Encoding: gzip, deflate\r\n

 $\label{localization} \mbox{Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\\ \mbox{$\mbox{$r$}\mbox{$\mbox{γ}$}$} \\ \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\mbox{γ}$}$} \\ \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \\ \mbox{$\mbox{$\mbox{γ}$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \mbox{$\mbox{$\gamma$}$} \\ \mbox{$\mbox{$\gamma$}$} \\ \mbox{$\mbox{$\gamma$}$} \mbox{\mbox

\r\n

[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html]

[HTTP request 1/3]
[Response in frame: 61]
[Next request in frame: 62]