

# 컴퓨터네트워크

- 1분반 -

과제 #02

컴퓨터과학과

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임채선

## 2.1 Basic HTTP GET/response interaction

1. 브라우저가 HTTP 버전 1.0 또는 1.1을 실행하고 있습니까?

서버가 실행 중인 HTTP의 버전은 무엇입니까?

- 브라우저가 실행 중인 HTTP 버전은 1.1이며 서버가 실행 중인 HTTP 버전도 1.1입니다.

2. 귀하의 브라우저가 서버에 수락할 수 있음을 나타내는 언어 (있을 경우)는 무엇입니까?

```
Accept-Language: ko-KR,ko;q=0.9,en-US;q=0.8,en;q=0.7\r\n
```

- 위의 캡처와 같이 ko-KR(한글), en-US(영문) 입니다.

3. 컴퓨터의 IP 주소는 무엇입니까? gaia.cs.umass.edu 서버 주소는 무엇입니까?

- 컴퓨터의 IP 주소 : 192.168.42.67
- gaia.cs.umass.edu 의 서버 주소 : 128.119.245.12

4. 서버에서 브라우저로 반환되는 상태 코드(status code)는 무엇입니까?

- 서버에서 브라우저로 반환되는 상태 코드는 "200 OK" 입니다.

5. 검색 중인 HTML 파일이 서버에서 마지막으로 수정 된(Last-Modified) 시점은 언제입니까?

```
Last-Modified: Sun, 31 Mar 2019 05:59:01 GMT\r\n
```

- 마지막으로 수정된 시점은 2019년3월31일 일요일 05시59분01초 GMT입니다.

6. 브라우저에 몇 바이트의 콘텐츠가 반환됩니까?

```
Accept-Ranges: bytes\r\nContent-Type: text/html; charset=UTF-8\r\nContent-Length: 128\r\n
```

- 128 바이트의 콘텐츠가 반환되었습니다.

7. 패킷 내용 창에서 원시 데이터가 모두 패킷 헤더창에 있습니까?

- 패킷 내용 창의 원시 데이터가 모두 패킷 헤더 창에 있습니다.

No.	Time	Source	Destination	Protocol	Length	Info
21	13:12:10.086946	192.168.42.67	128.119.245.12	HTTP	533	GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1

Frame 21: 533 bytes on wire (4264 bits), 533 bytes captured (4264 bits) on interface 0  
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)  
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12  
Transmission Control Protocol, Src Port: 54976, Dst Port: 80, Seq: 1, Ack: 1, Len: 479  
Hypertext Transfer Protocol  
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]  
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/73.0.3683.86 Safari/537.36\r\n  
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,\*/\*;q=0.8,application/signed-exchange;v=b3\r\n  
Accept-Encoding: gzip, deflate\r\n  
Accept-Language: ko-KR,ko;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 1/1]  
[Response in frame: 22]

No.	Time	Source	Destination	Protocol	Length	Info
22	13:12:10.196094	128.119.245.12	192.168.42.67	HTTP	518	HTTP/1.1 200 OK (text/html)

Frame 22: 518 bytes on wire (4144 bits), 518 bytes captured (4144 bits) on interface 0  
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)  
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67  
Transmission Control Protocol, Src Port: 80, Dst Port: 54976, Seq: 1, Ack: 480, Len: 464  
Hypertext Transfer Protocol  
HTTP/1.1 200 OK\r\n  
[Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]  
Response Version: HTTP/1.1  
Status Code: 200  
[Status Code Description: OK]  
Response Phrase: OK  
Date: Mon, 01 Apr 2019 04:07:39 GMT\r\n  
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod\_perl/2.0.10 Perl/v5.16.3\r\n  
Last-Modified: Sun, 31 Mar 2019 05:59:01 GMT\r\n  
ETag: "80-5855d99bc1d0e"\r\n  
Accept-Ranges: bytes\r\n  
Content-Type: text/html; charset=UTF-8\r\n  
Content-Length: 128\r\n  
Connection: Keep-Alive\r\n  
Age: 271\r\n  
\r\n  
[HTTP response 1/1]  
[Time since request: 0.109148000 seconds]  
[Request in frame: 21]  
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]  
File Data: 128 bytes  
Line-based text data: text/html (4 lines)

## 2.2. The HTTP CONDITIONAL GET/response interaction

8. 브라우저에서 서버로 첫 번째 HTTP GET 요청의 내용을 검사합니다.

HTTP GET에서 'IF-MODIFIED-SINCE'행이 있습니까?

- 없습니다.

9. 서버 응답의 내용을 검사하십시오. 서버가 명시적으로 파일의 내용을 반환했습니까?

어떻게 알 수 있습니까?

- 패킷 헤더 창에서의 Line-based text data의 내용을 통하여 서버가 명시적으로 파일의 내용을 반환한 것을 알 수 있습니다.

10. 브라우저에서 서버로 두 번째 HTTP GET 요청 내용을 검사합니다.

HTTP GET에서 "IF-MODIFIED-SINCE : "행이 보이십니까? 그렇다면 "IF-MODIFIED-SINCE : "

헤더 뒤에 오는 정보는 무엇입니까?

- 네 IF-MODIFIED-SINCE 행이 존재합니다. 해당 헤더 뒤의 정보는

`If-Modified-Since: Sun, 31 Mar 2019 05:59:01 GMT\r\n` 으로

앞서 진행한 Last-Modified와 동일한 정보를 가지고 있습니다.

11. 이 두 번째 HTTP GET에 대한 응답으로 서버에서 반환된 HTTP 상태 코드 및 구문은

무엇입니까? 서버가 명시적으로 파일의 내용을 반환했습니까?

- 두 번째 GET에 대한 응답으로 반환된 상태 코드는 "304 Not Modified"이며

서버가 명시적으로 파일의 내용을 반환하지 않았습니다.

```
No.      Time      Source      Destination      Protocol Length Info
 18 13:34:38.088940 192.168.42.67 128.119.245.12  HTTP      533      GET /wireshark-labs/HTTP-
wireshark-file2.html HTTP/1.1
Frame 18: 533 bytes on wire (4264 bits), 533 bytes captured (4264 bits) on interface 0
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 55608, Dst Port: 80, Seq: 1, Ack: 1, Len: 479
Hypertext Transfer Protocol
  GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
    [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n]
    Request Method: GET
    Request URI: /wireshark-labs/HTTP-wireshark-file2.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/
73.0.3683.86 Safari/537.36\r\n
  Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/
signed-exchange;v=b3\r\n
  Accept-Encoding: gzip, deflate\r\n
  Accept-Language: ko-KR,ko;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-file2.html]
[HTTP request 1/2]
[Response in frame: 25]
[Next request in frame: 43]
No.      Time      Source      Destination      Protocol Length Info
 25 13:34:38.678322 128.119.245.12 192.168.42.67  HTTP      760      HTTP/1.1 200 OK (text/
html)
Frame 25: 760 bytes on wire (6080 bits), 760 bytes captured (6080 bits) on interface 0
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67
Transmission Control Protocol, Src Port: 80, Dst Port: 55608, Seq: 1, Ack: 480, Len: 706
Hypertext Transfer Protocol
  HTTP/1.1 200 OK\r\n
    [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
    Response Version: HTTP/1.1
    Status Code: 200
    [Status Code Description: OK]
    Response Phrase: OK
  Date: Mon, 01 Apr 2019 04:34:38 GMT\r\n
  Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.10 Perl/v5.16.3\r\n
  Last-Modified: Sun, 31 Mar 2019 05:59:01 GMT\r\n
  ETag: "173-5855d99bc1156"\r\n
  Accept-Ranges: bytes\r\n
  Content-Type: text/html; charset=UTF-8\r\n
  Content-Length: 371\r\n
  Connection: Keep-Alive\r\n
  Age: 0\r\n
\r\n
[HTTP response 1/2]
[Time since request: 0.589382000 seconds]
[Request in frame: 18]
[Next request in frame: 43]
[Next response in frame: 52]
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.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
 43 13:34:43.479319 192.168.42.67 128.119.245.12  HTTP      645      GET /wireshark-labs/HTTP-
wireshark-file2.html HTTP/1.1
Frame 43: 645 bytes on wire (5160 bits), 645 bytes captured (5160 bits) on interface 0
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 55608, Dst Port: 80, Seq: 480, Ack: 707, Len: 591
Hypertext Transfer Protocol
  GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
    [Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n]
```

```
Request Method: GET
Request URI: /wireshark-labs/HTTP-wireshark-file2.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
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/
73.0.3683.86 Safari/537.36\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/
signed-exchange;v=b3\r\n
Accept-Encoding: gzip, deflate\r\n
Accept-Language: ko-KR,ko;q=0.9,en-US;q=0.8,en;q=0.7\r\n
If-None-Match: "173-5855d99bc1156"\r\n
If-Modified-Since: Sun, 31 Mar 2019 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: 18]
[Response in frame: 52]
No.      Time                Source                Destination            Protocol Length Info
    52 13:34:44.726882    128.119.245.12        192.168.42.67          HTTP      54      HTTP/1.1 304 Not Modified
Frame 52: 54 bytes on wire (432 bits), 54 bytes captured (432 bits) on interface 0
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67
Transmission Control Protocol, Src Port: 80, Dst Port: 55608, Seq: 1026, Ack: 1071, Len: 0
[2 Reassembled TCP Segments (319 bytes): #51(319), #52(0)]
Hypertext Transfer Protocol
  HTTP/1.1 304 Not Modified\r\n
    [Expert Info (Chat/Sequence): HTTP/1.1 304 Not Modified\r\n]
    Response Version: HTTP/1.1
    Status Code: 304
    [Status Code Description: Not Modified]
    Response Phrase: Not Modified
Date: Mon, 01 Apr 2019 04:34:43 GMT\r\n
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.10 Perl/v5.16.3\r\n
Last-Modified: Sun, 31 Mar 2019 05:59:01 GMT\r\n
ETag: "173-5855d99bc1156"\r\n
Accept-Ranges: bytes\r\n
Content-Type: text/html; charset=UTF-8\r\n
Connection: close\r\n
Age: 0\r\n
\r\n
[HTTP response 2/2]
[Time since request: 1.247563000 seconds]
[Prev request in frame: 18]
[Prev response in frame: 25]
[Request in frame: 43]
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
```

## 2.3 Retrieving Long Documents

12. 브라우저는 몇 개의 HTTP GET 요청 메시지를 보냈습니까?

어떤 패킷 번호에 Bill이나 Rights에 대한 GET 메시지가 들어 있습니까?

- 브라우저는 1개의 HTTP GET 요청 메시지를 보냈으며 해당 패킷 번호는 19번입니다.

13. 추적에서 HTTP GET 요청에 대한 응답과 관련된 상태 코드 및 구문을 포함하는

패킷 번호는 무엇입니까?

- 해당 패킷 번호는 28번입니다.

14. 응답의 상태 코드(status code)와 구문(phrase)은 무엇입니까?

- 상태 코드 및 구문은 "200 OK" 입니다.

15. 단일 HTTP 응답 (Bill of Rights)을 위해 몇 개의 데이터를 포함하는 TCP 세그먼트가 있었나요?

[5 Reassembled TCP Segments (4837 bytes): #22(1400), #23(1400), #25(1400), #26(180), #28(457)]

- 5개의 TCP 세그먼트가 있었습니다.

```
No.      Time      Source      Destination      Protocol Length Info
13 13:53:54.492112 192.168.42.67 128.119.245.12 HTTP 533 GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1
Frame 13: 533 bytes on wire (4264 bits), 533 bytes captured (4264 bits) on interface 0
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 49622, Dst Port: 80, Seq: 1, Ack: 1, Len: 479
Hypertext Transfer Protocol
GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1\r\n
[Expert Info (Chat/Sequence): GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1\r\n]
Request Method: GET
Request URI: /wireshark-labs/HTTP-wireshark-file3.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/73.0.3683.86 Safari/537.36\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3\r\n
Accept-Encoding: gzip, deflate\r\n
Accept-Language: ko-KR,ko;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-file3.html]
[HTTP request 1/1]
[Response in frame: 24]
No.      Time      Source      Destination      Protocol Length Info
24 13:53:55.038786 128.119.245.12 192.168.42.67 HTTP 511 HTTP/1.1 200 OK (text/html)
Frame 24: 511 bytes on wire (4088 bits), 511 bytes captured (4088 bits) on interface 0
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67
Transmission Control Protocol, Src Port: 80, Dst Port: 49622, Seq: 4381, Ack: 480, Len: 457
[5 Reassembled TCP Segments (4837 bytes): #18(1400), #19(1400), #21(1400), #22(180), #24(457)]
Hypertext Transfer Protocol
HTTP/1.1 200 OK\r\n
[Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
Response Version: HTTP/1.1
Status Code: 200
[Status Code Description: OK]
Response Phrase: OK
Date: Mon, 01 Apr 2019 04:53:54 GMT\r\n
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.10 Perl/v5.16.3\r\n
Last-Modified: Sun, 31 Mar 2019 05:59:01 GMT\r\n
ETag: "1194-5855d99bbbf4d"\r\n
Accept-Ranges: bytes\r\n
Content-Type: text/html; charset=UTF-8\r\n
Content-Length: 4500\r\n
Connection: Keep-Alive\r\n
Age: 0\r\n
\r\n
[HTTP response 1/1]
[Time since request: 0.546674000 seconds]
[Request in frame: 13]
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file3.html]
File Data: 4500 bytes
Line-based text data: text/html (98 lines)
<html><head> \n
<title>Historical Documents:THE BILL OF RIGHTS</title></head>\n
\n
\n
<body bgcolor="#ffffff" link="#330000" vlink="#666633">\n
<p><br>\n
</p>\n
<p></p><center><b>THE BILL OF RIGHTS</b><br>\n
<em>Amendments 1-10 of the Constitution</em>\n
</center>\n
\n
<p>The Conventions of a number of the States having, at the time of adopting\n
the Constitution, expressed a desire, in order to prevent misconstruction\n
or abuse of its powers, that further declaratory and restrictive clauses\n
should be added, and as extending the ground of public confidence in the\n
Government will best insure the beneficent ends of its institution; </p><p> Resolved, by the Senate and
House of Representatives of the United\n
States of America, in Congress assembled, two-thirds of both Houses concurring,\n
that the following articles be proposed to the Legislatures of the several\n
States, as amendments to the Constitution of the United States; all or any\n
of which articles, when ratified by three-fourths of the said Legislatures,\n
to be valid to all intents and purposes as part of the said Constitution,\n
```



namely: [\*\*Amendment I\*\*](#)  
Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.

[\*\*Amendment II\*\*](#)  
A well regulated militia, being necessary to the security of a free state, the right of the people to keep and bear arms, shall not be infringed.

[\*\*Amendment III\*\*](#)  
No soldier shall, in time of peace be quartered in any house, without the consent of the owner, nor in time of war, but in a manner to be prescribed by law.

[\*\*Amendment IV\*\*](#)  
The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

[\*\*Amendment V\*\*](#)  
No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

[\*\*Amendment VI\*\*](#)  
In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the state and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defense.

[\*\*Amendment VII\*\*](#)  
In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise reexamined in any court of the United States, than according to the rules of the common law.

[\*\*Amendment VIII\*\*](#)  
Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

[\*\*Amendment IX\*\*](#)  
The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

[\*\*Amendment X\*\*](#)  
The powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people.

## 2.4 HTML Documents with Embedded Objects

16. 브라우저는 몇 개의 HTTP GET 요청 메시지를 보냈습니까? 이 GET 요청은

어떤 인터넷 주소에 전송되었습니까?

- HTTP GET 요청을 3개 보냈으며 모든 GET 요청은 128.119.245.12의 주소로 전송되었습니다.

17. 브라우저가 두 이미지를 순차적으로 다운로드했는지 또는 두 웹 사이트에서

동시에 다운로드했는지 알 수 있습니까? 설명하세요

- 브라우저가 두 이미지를 순차적으로 다운로드 했다고 생각합니다.

같은 주소에서 이미지를 다운로드 하였으므로 두 이미지의 요청 시간에 차이가 있는 것을

보아 순차적으로 이미지를 다운로드 했다고 생각합니다.

동시에 다운로드했다면 이미지 요청 시간이 동일한 시간으로 나타났을 것입니다.

No.	Time	Source	Destination	Protocol	Length	Info
36	13:54:24.351544	192.168.42.67	128.119.245.12	HTTP	533	GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
Frame 36: 533 bytes on wire (4264 bits), 533 bytes captured (4264 bits) on interface 0 Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78) Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12 Transmission Control Protocol, Src Port: 49627, Dst Port: 80, Seq: 1, Ack: 1, Len: 479 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/73.0.3683.86 Safari/537.36\r\n Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3\r\n Accept-Encoding: gzip, deflate\r\n Accept-Language: ko-KR,ko;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-file4.html] [HTTP request 1/2] [Response in frame: 42] [Next request in frame: 43]						
42	13:54:24.870946	128.119.245.12	192.168.42.67	HTTP	1103	HTTP/1.1 200 OK (text/html)
Frame 42: 1103 bytes on wire (8824 bits), 1103 bytes captured (8824 bits) on interface 0 Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23) Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67 Transmission Control Protocol, Src Port: 80, Dst Port: 49627, Seq: 1, Ack: 480, Len: 1049 Hypertext Transfer Protocol HTTP/1.1 200 OK\r\n [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n] Response Version: HTTP/1.1 Status Code: 200 [Status Code Description: OK] Response Phrase: OK Date: Mon, 01 Apr 2019 04:54:24 GMT\r\n Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.10 Perl/v5.16.3\r\n Last-Modified: Sun, 31 Mar 2019 05:59:01 GMT\r\n ETag: "2ca-5855d99bc059e"\r\n Accept-Ranges: bytes\r\n Content-Type: text/html; charset=UTF-8\r\n Content-Length: 714\r\n Connection: Keep-Alive\r\n Age: 0\r\n \r\n [HTTP response 1/2] [Time since request: 0.519402000 seconds] [Request in frame: 36] [Next request in frame: 43] [Next response in frame: 60] [Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html] File Data: 714 bytes Line-based text data: text/html (17 lines) <html>\n<head>\n<title>Lab2-4 file: Embedded URLs</title>\n<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">\n</head>\n\n<body bgcolor="#FFFFFF" text="#000000">\n\n<p>\n </p>\n<p>This little HTML file is being served by gaia.cs.umass.edu. \nIt contains two embedded images.   The image above, also served from the \ngaia.cs.umass.edu web site, is the logo of our publisher, Pearson.  \nThe image of our 5th edition book cover below is stored at, and served from, the www server caite.cs.umass.edu:</p>\n<p align="left"></p>\n</body>\n</html>\n						
43	13:54:24.884017	192.168.42.67	128.119.245.12	HTTP	471	GET /pearson.png HTTP/1.1

Frame 43: 471 bytes on wire (3768 bits), 471 bytes captured (3768 bits) on interface 0  
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)  
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12  
Transmission Control Protocol, Src Port: 49627, Dst Port: 80, Seq: 480, Ack: 1050, Len: 417  
Hypertext Transfer Protocol  
GET /pearson.png HTTP/1.1\r\n  
[Expert Info (Chat/Sequence): GET /pearson.png HTTP/1.1\r\n]  
Request Method: GET  
Request URI: /pearson.png  
Request Version: HTTP/1.1  
Host: gaia.cs.umass.edu\r\n  
Connection: keep-alive\r\n  
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/  
73.0.3683.86 Safari/537.36\r\n  
Accept: image/webp,image/apng,image/\*,\*/\*;q=0.8\r\n  
Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n  
Accept-Encoding: gzip, deflate\r\n  
Accept-Language: ko-KR,ko;q=0.9,en-US;q=0.8,en;q=0.7\r\n  
\r\n  
[Full request URI: http://gaia.cs.umass.edu/pearson.png]  
[HTTP request 2/2]  
[Prev request in frame: 36]  
[Response in frame: 60]

No.	Time	Source	Destination	Protocol	Length	Info
49	13:54:25.072416	192.168.42.67	128.119.245.12	HTTP	485	GET /~kurose/ cover_5th_ed.jpg HTTP/1.1

Frame 49: 485 bytes on wire (3880 bits), 485 bytes captured (3880 bits) on interface 0  
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)  
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12  
Transmission Control Protocol, Src Port: 49628, Dst Port: 80, Seq: 1, Ack: 1, Len: 431  
Hypertext Transfer Protocol  
GET /~kurose/cover\_5th\_ed.jpg HTTP/1.1\r\n  
[Expert Info (Chat/Sequence): GET /~kurose/cover\_5th\_ed.jpg HTTP/1.1\r\n]  
Request Method: GET  
Request URI: /~kurose/cover\_5th\_ed.jpg  
Request Version: HTTP/1.1  
Host: manic.cs.umass.edu\r\n  
Connection: keep-alive\r\n  
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/  
73.0.3683.86 Safari/537.36\r\n  
Accept: image/webp,image/apng,image/\*,\*/\*;q=0.8\r\n  
Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n  
Accept-Encoding: gzip, deflate\r\n  
Accept-Language: ko-KR,ko;q=0.9,en-US;q=0.8,en;q=0.7\r\n  
\r\n  
[Full request URI: http://manic.cs.umass.edu/~kurose/cover\_5th\_ed.jpg]  
[HTTP request 1/1]  
[Response in frame: 192]

No.	Time	Source	Destination	Protocol	Length	Info
60	13:54:25.274376	128.119.245.12	192.168.42.67	HTTP	769	HTTP/1.1 200 OK (PNG)

Frame 60: 769 bytes on wire (6152 bits), 769 bytes captured (6152 bits) on interface 0  
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)  
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67  
Transmission Control Protocol, Src Port: 80, Dst Port: 49627, Seq: 3923, Ack: 897, Len: 715  
[5 Reassembled TCP Segments (3588 bytes): #55(1400), #56(25), #58(1400), #59(48), #60(715)]  
Hypertext Transfer Protocol  
HTTP/1.1 200 OK\r\n  
[Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]  
Response Version: HTTP/1.1  
Status Code: 200  
[Status Code Description: OK]  
Response Phrase: OK  
Date: Mon, 01 Apr 2019 04:54:25 GMT\r\n  
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod\_perl/2.0.10 Perl/v5.16.3\r\n  
Last-Modified: Sat, 06 Aug 2016 10:08:14 GMT\r\n  
ETag: "cc3-539645c7f1ee7"\r\n  
Accept-Ranges: bytes\r\n  
Content-Type: image/png\r\n  
Content-Length: 3267\r\n  
Connection: Keep-Alive\r\n  
Age: 0\r\n  
\r\n  
[HTTP response 2/2]  
[Time since request: 0.390359000 seconds]  
[Prev request in frame: 36]  
[Prev response in frame: 42]  
[Request in frame: 43]  
[Request URI: http://gaia.cs.umass.edu/pearson.png]  
File Data: 3267 bytes

Portable Network Graphics

No.	Time	Source	Destination	Protocol	Length	Info
192	13:54:26.686579	128.119.245.12	192.168.42.67	HTTP	398	HTTP/1.1 200 OK (JPEG JFIF image)

Frame 192: 398 bytes on wire (3184 bits), 398 bytes captured (3184 bits) on interface 0  
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)  
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67  
Transmission Control Protocol, Src Port: 80, Dst Port: 49628, Seq: 100951, Ack: 432, Len: 344  
[88 Reassembled TCP Segments (101294 bytes): #63(1400), #64(1400), #65(1400), #66(180), #68(1400), #69(1400), #70(1400), #71(627), #73(1400), #74(1400), #76(1400), #77(1033), #79(1400), #80(1400), #81(1400), #82(1400), #83(7), #85(1400), #8]

Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

[Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]

Response Version: HTTP/1.1

Status Code: 200

[Status Code Description: OK]

Response Phrase: OK

Date: Mon, 01 Apr 2019 04:54:25 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod\_perl/2.0.10 Perl/v5.16.3\r\n

Last-Modified: Tue, 15 Sep 2009 18:23:27 GMT\r\n

ETag: "18a68-473a1e0e6e5c0"\r\n

Accept-Ranges: bytes\r\n

Content-Type: image/jpeg\r\n

Content-Length: 100968\r\n

Connection: Keep-Alive\r\n

Age: 0\r\n

\r\n

[HTTP response 1/1]

[Time since request: 1.614163000 seconds]

[Request in frame: 49]

[Request URI: http://manic.cs.umass.edu/~kurose/cover\_5th\_ed.jpg]

File Data: 100968 bytes

JPEG File Interchange Format

## 2.5 HTTP Authentication

18. 브라우저의 초기 HTTP GET 메시지에 대한 응답으로 서버의 응답(상태 코드 및 구문)은 무엇입니까?

- 브라우저의 초기 GET 요청에 대한 응답의 상태 코드 및 구문은  
"401 Unauthorized"입니다.

19. 브라우저가 두 번째로 HTTP GET 메시지를 보내면 HTTP GET 메시지에 어떤 새로운 필드가 포함됩니까?

- 두번째 GET 요청에는 Authorization 필드가 추가되었습니다.

No. Time Source Destination Protocol Length Info  
4 14:04:42.229502 192.168.42.67 128.119.245.12 HTTP 549 GET /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html HTTP/1.1

Frame 4: 549 bytes on wire (4392 bits), 549 bytes captured (4392 bits) on interface 0  
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)  
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12  
Transmission Control Protocol, Src Port: 49824, Dst Port: 80, Seq: 1, Ack: 1, Len: 495  
Hypertext Transfer Protocol  
GET /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n  
[Expert Info (Chat/Sequence): GET /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n\r\n]  
Request Method: GET  
Request URI: /wireshark-labs/protected\_pages/HTTP-wireshark-file5.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/73.0.3683.86 Safari/537.36\r\n  
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,\*/\*;q=0.8,application/signed-exchange;v=b3\r\n  
Accept-Encoding: gzip, deflate\r\n  
Accept-Language: ko-KR,ko;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/protected\_pages/HTTP-wireshark-file5.html]  
[HTTP request 1/1]  
[Response in frame: 9]

No. Time Source Destination Protocol Length Info  
9 14:04:42.752565 128.119.245.12 192.168.42.67 HTTP 772 HTTP/1.1 401 Unauthorized (text/html)

Frame 9: 772 bytes on wire (6176 bits), 772 bytes captured (6176 bits) on interface 0  
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)  
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67  
Transmission Control Protocol, Src Port: 80, Dst Port: 49824, Seq: 1, Ack: 496, Len: 718  
Hypertext Transfer Protocol  
HTTP/1.1 401 Unauthorized\r\n  
[Expert Info (Chat/Sequence): HTTP/1.1 401 Unauthorized\r\n\r\n]  
Response Version: HTTP/1.1  
Status Code: 401  
[Status Code Description: Unauthorized]  
Response Phrase: Unauthorized  
Date: Mon, 01 Apr 2019 05:04:42 GMT\r\n  
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod\_perl/2.0.10 Perl/v5.16.3\r\n  
WWW-Authenticate: Basic realm="wireshark-students only"\r\n  
Content-Type: text/html; charset=iso-8859-1\r\n  
Cache-Control: proxy-revalidate\r\n  
Content-Length: 381\r\n  
Connection: Keep-Alive\r\n  
\r\n  
[HTTP response 1/1]  
[Time since request: 0.523063000 seconds]  
[Request in frame: 4]  
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/protected\_pages/HTTP-wireshark-file5.html]  
File Data: 381 bytes

Line-based text data: text/html (12 lines)  
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">\n  
<html><head>\n  
<title>401 Unauthorized</title>\n  
</head><body>\n  
<h1>Unauthorized</h1>\n  
<p>This server could not verify that you\nare authorized to access the document\nrequested. Either you supplied the wrong\ncredentials (e.g., bad password), or your\nbrowser doesn't understand how to supply\nthe credentials required.</p>\n  
</body></html>\n

No. Time Source Destination Protocol Length Info  
153 14:04:49.824937 192.168.42.67 128.119.245.12 HTTP 608 GET /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html HTTP/1.1

Frame 153: 608 bytes on wire (4864 bits), 608 bytes captured (4864 bits) on interface 0  
Ethernet II, Src: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23), Dst: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78)  
Internet Protocol Version 4, Src: 192.168.42.67, Dst: 128.119.245.12  
Transmission Control Protocol, Src Port: 49835, Dst Port: 80, Seq: 1, Ack: 1, Len: 554  
Hypertext Transfer Protocol  
GET /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n  
[Expert Info (Chat/Sequence): GET /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n\r\n]  
Request Method: GET  
Request URI: /wireshark-labs/protected\_pages/HTTP-wireshark-file5.html  
Request Version: HTTP/1.1

```
Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
Authorization: Basic d2lyZXNoYXJrLXN0dWRlbnRzOm5ldHdvcm5l\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/
73.0.3683.86 Safari/537.36\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/
signed-exchange;v=b3\r\n
Accept-Encoding: gzip, deflate\r\n
Accept-Language: ko-KR,ko;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/protected_pages/HTTP-wireshark-file5.html]
[HTTP request 1/1]
[Response in frame: 155]

No.      Time            Source            Destination      Protocol Length Info
 155 14:04:50.350301 128.119.245.12    192.168.42.67    HTTP           553    HTTP/1.1 200 OK (text/
html)
Frame 155: 553 bytes on wire (4424 bits), 553 bytes captured (4424 bits) on interface 0
Ethernet II, Src: 6a:e5:7a:50:f2:78 (6a:e5:7a:50:f2:78), Dst: 3e:e4:9f:48:ac:23 (3e:e4:9f:48:ac:23)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.42.67
Transmission Control Protocol, Src Port: 80, Dst Port: 49835, Seq: 1, Ack: 555, Len: 499
Hypertext Transfer Protocol
  HTTP/1.1 200 OK\r\n
    [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
    Response Version: HTTP/1.1
    Status Code: 200
    [Status Code Description: OK]
    Response Phrase: OK
  Date: Mon, 01 Apr 2019 05:04:50 GMT\r\n
  Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.10 Perl/v5.16.3\r\n
  Last-Modified: Mon, 01 Apr 2019 05:04:01 GMT\r\n
  ETag: "84-58570f2e30f9f"\r\n
  Accept-Ranges: bytes\r\n
  Content-Type: text/html; charset=UTF-8\r\n
  Cache-Control: proxy-revalidate\r\n
  Content-Length: 132\r\n
  Connection: Keep-Alive\r\n
  Age: 0\r\n
\r\n
[HTTP response 1/1]
[Time since request: 0.525364000 seconds]
[Request in frame: 153]
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/protected_pages/HTTP-wireshark-file5.html]
File Data: 132 bytes
Line-based text data: text/html (6 lines)
\r\n
<html>\r\n
\r\n
This page is password protected!  If you're seeing this, you've downloaded the page correctly <br>\r\n
Congratulations!\r\n
</html>
```