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ЗВІТ
про виконання лабораторних робіт
з дисципліни “Комп’ютерні мережі”
Лабораторна робота №2 Протокол HTTP

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Лабораторна робота № 2. Протокол HTTP

Мета роботи: аналіз деталей роботи протоколу HTTP.

2.1. Теоретичні відомості

2.2. Хід роботи

Необхідно виконати наступні дії:

1. Запустіть веб-браузер, очистіть кеш браузера:
 - a. для Firefox виконайте
Tools >> Clear Private Data (або Ctrl + Shift + Del)
 - b. для MS IE виконайте
Tools >> Internet Options >> Delete File
2. Запустіть Wireshark, введіть «http» в поле фільтрації, почніть захоплення пакетів.
3. Відкрийте за допомогою браузера одну із зазначених нижче адрес:
<http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html>
<http://194.44.29.242/index.html>
4. Зупиніть захоплення пакетів.
5. Перегляньте деталі захоплених пакетів. Для цього налаштуйте вікно деталей пакету: згорніть деталі протоколів усіх рівнів крім HTTP (за допомогою знаків +/-).
6. Приготуйте відповіді на контрольні запитання 1-7, роздрукуйте необхідні для цього пакети.
7. Почніть захоплення пакетів.
8. Відкрийте у браузері ту ж саму сторінку, або ж просто натисніть F5 для її повторного завантаження.
Якщо ви працюєте зі сторінкою на gaia.cs.umass.edu (ця сторінка регенерується кожну хвилину) – почніть спочатку та виконайте кроки 1,2,3 та 8.
9. Зупиніть захоплення пакетів.
10. Приготуйте відповіді на контрольні запитання 8-11, роздрукуйте необхідні для цього пакети.
11. Виберіть адрес деякого ресурсу (наприклад, зображення), розмір якого перевищує 8192 байти. Можна, наприклад, використати
<http://www.dilbert.com/dyn/strip/000000000/00000000/0000000/000000/70000/3000/400/73435/73435.strip.gif>
<http://www.dilbert.com/dyn/strip/000000000/00000000/0000000/000000/70000/7000/300/77356/77356.strip.sunday.gif>
або будь-який не дуже великий файл з серверу 194.44.29.242.
12. Почніть захоплення пакетів та очистіть кеш браузера.
13. Відкрийте обраний ресурс браузером.
14. Зупиніть захоплення пакетів.
15. Приготуйте відповіді на запитання 12-15. При необхідності роздрукуйте деякі пакети з відповіді сервера.
16. Почніть захоплення пакетів.
17. Відкрийте сторінку за адресою
<http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html>
також можна використати будь-яку нескладну сторінку з невеликою кількістю зовнішніх ресурсів.
18. Зупиніть захоплення пакетів.
19. Приготуйте відповіді на запитання 16, 17. Роздрукуйте необхідні для цього пакети.
20. Закрийте Wireshark.

2.3. Контрольні запитання

Форма звітності: роздруківки збережених в ході ЛР пакетів з фаміліями, ініціалами та групами виконавців (бажано на кожній сторінці).

Контрольні запитання:

1. Яку версію протоколу HTTP використовує ваш браузер (1.0 чи 1.1)? Яку версію протоколу використовує сервер?
2. Які мови (якщо вказано) браузер може прийняти від сервера?
3. Які IP-адреси вашого комп'ютера та цільового веб-сервера?
4. Який статусний код сервер повернув у відповіді вашому браузеру?
5. Коли на сервері в останній раз був модифікований файл, який запитується браузером?
6. Скільки байт контенту повертається сервером?
7. Переглядаючи нерозібраний байтовий потік пакету, чи бачите ви деякі заголовки в потоці, які не відображаються у вікні деталей пакету? Якщо так, назвіть один з них.
8. Перевірте вміст першого запиту HTTP GET від вашого браузера до сервера. Чи є в ньому заголовок IF-MODIFIED-SINCE?
9. Перевірте вміст першої відповіді сервера. Чи повернув сервер вміст файлу безпосередньо у відповіді?
10. Перевірте вміст другого запиту HTTP GET. Чи є в ньому заголовок IF-MODIFIED-SINCE? Якщо так, яке значення йому відповідає?
11. Який код та опис статусу другої відповіді сервера? Чи повернув сервер вміст файлу безпосередньо у відповіді?
12. Скільки повідомлень HTTP GET було відправлено вашим браузером?
13. Скільки пакетів TCP було необхідно для доставки одної відповіді HTTP-сервера?
14. Який код та опис статусу був у відповіді сервера?
15. Чи зустрічаються у даних пакетів-продовжень протоколу TCP стрічки з кодом та описом статусу відповіді, або ж якісь заголовки протоколу HTTP?
16. Скільки запитів HTTP GET було відправлено вашим браузером? Якими були цільові IP-адреси запитів?
17. Чи можете ви встановити, чи були ресурси отримані паралельно чи послідовно? Яким чином?

Контрольні запитання:

Запитання 1-7

No.	Time	Source	Destination	Protocol	Length	Info
50	4.483746	192.168.1.108	128.119.245.12	HTTP	471	GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1

Frame 50: 471 bytes on wire (3768 bits), 471 bytes captured (3768 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12

Transmission Control Protocol, Src Port: 1440, Dst Port: 80, Seq: 1, Ack: 1, Len: 417

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]

[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

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n

Accept-Language: ru-RU\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/70.0.3538.102 Safari/537.36 Edge/18.18362\r\n

Accept-Encoding: gzip, deflate\r\n

Host: gaia.cs.umass.edu\r\n

DNT: 1\r\n

Connection: Keep-Alive\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: 64]

No.	Time	Source	Destination	Protocol	Length	Info
64	4.621219	128.119.245.12	192.168.1.108	HTTP	540	HTTP/1.1 200 OK (text/html)

Frame 64: 540 bytes on wire (4320 bits), 540 bytes captured (4320 bits) on interface
\\Device\\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0
Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc
(60:57:18:4f:90:fc)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108
Transmission Control Protocol, Src Port: 80, Dst Port: 1440, Seq: 1, Ack: 418, Len: 486
Hypertext Transfer Protocol
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: Tue, 28 Apr 2020 06:55:07 GMT\\r\\n
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11
Perl/v5.16.3\\r\\n
Last-Modified: Tue, 28 Apr 2020 05:59:03 GMT\\r\\n
ETag: "80-5a4538757d2f2"\\r\\n
Accept-Ranges: bytes\\r\\n
Content-Length: 128\\r\\n
[Content length: 128]
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: 0.137473000 seconds]
[Request in frame: 50]
[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)
<html>\\n
Congratulations. You've downloaded the file \\n
http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html!\\n
</html>\\n

1. Яку версію протоколу HTTP використовує ваш браузер (1.0 чи 1.1)? Яку версію протоколу використовує сервер?

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

2. Які мови (якщо вказано) браузер може прийняти від сервера?

Accept-Language: ru-RU\r\n

3. Які IP-адреси вашого комп'ютера та цільового веб-сервера?

IP-адреси вашого комп'ютера: Source 192.168.1.108

IP-адреси цільового веб-сервера: Destination 128.119.245.12

4. Який статусний код сервер повернув у відповіді вашому браузеру?

HTTP/1.1 200 OK\r\n

Status Code: 200

[Status Code Description: OK]

Response Phrase: OK

5. Коли на сервері в останній раз був модифікований файл, який запитується браузером?

Last-Modified: Tue, 28 Apr 2020 05:59:03 GMT\r\n

6. Скільки байт контенту повертається сервером?

Content-Length: 128

7. Переглядаючи нерозібраний байтовий потік пакету, чи бачите ви деякі заголовки в потоці, які не відображаються у вікні деталей пакету? Якщо так, назвіть один з них.

```
000 60 38 e0 c9 a4 30 60 57 18 4f 90 fc 08 00 45 00 `8...0`W.O....E.
0010 01 c9 ca d3 40 00 80 06 f6 c2 c0 a8 01 6c 80 77 ....@.....l.w
0020 f5 0c 05 a0 00 50 58 87 c7 3e 8a 32 1e f1 50 18 .....PX..>.2..P.
0030 04 00 0e 3c 00 00 47 45 54 20 2f 77 69 72 65 73 ...<..GET /wires
0040 68 61 72 6b 2d 6c 61 62 73 2f 48 54 54 50 2d 77 hark-labs/HTTP-w
0050 69 72 65 73 68 61 72 6b 2d 66 69 6c 65 31 2e 68 ireshark-file1.h
0060 74 6d 6c 20 48 54 54 50 2f 31 2e 31 0d 0a 41 63 tml HTTP/1.1..Ac
0070 63 65 70 74 3a 20 74 65 78 74 2f 68 74 6d 6c 2c cept: text/html,
0080 61 70 70 6c 69 63 61 74 69 6f 6e 2f 78 68 74 6d application/xhtm
0090 6c 2b 78 6d 6c 2c 61 70 70 6c 69 63 61 74 69 6f l+xml,application
00a0 6e 2f 78 6d 6c 3b 71 3d 30 2e 39 2c 2a 2f 2a 3b n/xml;q=0.9,*/*;
00b0 71 3d 30 2e 38 0d 0a 41 63 63 65 70 74 2d 4c 61 q=0.8..Accept-La
00c0 6e 67 75 61 67 65 3a 20 72 75 2d 52 55 0d 0a 55 nguage: ru-RU..U
00d0 70 67 72 61 64 65 2d 49 6e 73 65 63 75 72 65 2d pgrade-Insecure-
00e0 52 65 71 75 65 73 74 73 3a 20 31 0d 0a 55 73 65 Requests: 1..Use
00f0 72 2d 41 67 65 6e 74 3a 20 4d 6f 7a 69 6c 6c 61 r-Agent: Mozilla
0100 2f 35 2e 30 20 28 57 69 6e 64 6f 77 73 20 4e 54 /5.0 (Windows NT
0110 20 31 30 2e 30 3b 20 57 69 6e 36 34 3b 20 78 36 10.0; Win64; x6
0120 34 29 20 41 70 70 6c 65 57 65 62 4b 69 74 2f 35 4) AppleWebKit/5
```

0130	33 37 2e 33 36 20 28 4b 48 54 4d 4c 2c 20 6c 69	37.36 (KHTML, li
0140	6b 65 20 47 65 63 6b 6f 29 20 43 68 72 6f 6d 65	ke Gecko) Chrome
0150	2f 37 30 2e 30 2e 33 35 33 38 2e 31 30 32 20 53	/70.0.3538.102 S
0160	61 66 61 72 69 2f 35 33 37 2e 33 36 20 45 64 67	afari/537.36 Edg
0170	65 2f 31 38 2e 31 38 33 36 32 0d 0a 41 63 63 65	e/18.18362...Acce
0180	70 74 2d 45 6e 63 6f 64 69 6e 67 3a 20 67 7a 69	pt-Encoding: gzi
0190	70 2c 20 64 65 66 6c 61 74 65 0d 0a 48 6f 73 74	p, deflate..Host
01a0	3a 20 67 61 69 61 2e 63 73 2e 75 6d 61 73 73 2e	: gaia.cs.umass.
01b0	65 64 75 0d 0a 44 4e 54 3a 20 31 0d 0a 43 6f 6e	edu..DNT: 1..Con
01c0	6e 65 63 74 69 6f 6e 3a 20 4b 65 65 70 2d 41 6c	nection: Keep-Al
01d0	69 76 65 0d 0a 0d 0a	ive....
0000	60 57 18 4f 90 fc 60 38 e0 c9 a4 30 08 00 45 00	`W.O.`8...0..E.
0010	02 0e 65 6b 40 00 31 06 aa e6 80 77 f5 0c c0 a8	..ek@.1....w....
0020	01 6c 00 50 05 a0 8a 32 1e f1 58 87 c8 df 50 18	.l.P...2..X...P.
0030	00 ed d9 5d 00 00 48 54 54 50 2f 31 2e 31 20 32	...].HTTP/1.1 2
0040	30 30 20 4f 4b 0d 0a 44 61 74 65 3a 20 54 75 65	00 OK..Date: Tue
0050	2c 20 32 38 20 41 70 72 20 32 30 32 30 20 30 36	, 28 Apr 2020 06
0060	3a 35 35 3a 30 37 20 47 4d 54 0d 0a 53 65 72 76	:55:07 GMT..Serv
0070	65 72 3a 20 41 70 61 63 68 65 2f 32 2e 34 2e 36	er: Apache/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 31 20 50 65 72 6c 2f 76 35	l/2.0.11 Perl/v5
00c0	2e 31 36 2e 33 0d 0a 4c 61 73 74 2d 4d 6f 64 69	.16.3..Last-Modi
00d0	66 69 65 64 3a 20 54 75 65 2c 20 32 38 20 41 70	fied: Tue, 28 Ap
00e0	72 20 32 30 32 30 20 30 35 3a 35 39 3a 30 33 20	r 2020 05:59:03
00f0	47 4d 54 0d 0a 45 54 61 67 3a 20 22 38 30 2d 35	GMT..ETag: "80-5
0100	61 34 35 33 38 37 35 37 64 32 66 32 22 0d 0a 41	a4538757d2f2"..A
0110	63 63 65 70 74 2d 52 61 6e 67 65 73 3a 20 62 79	ccept-Ranges: by
0120	74 65 73 0d 0a 43 6f 6e 74 65 6e 74 2d 4c 65 6e	tes..Content-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: timeout=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: Keep-Alive
0170	0d 0a 43 6f 6e 74 65 6e 74 2d 54 79 70 65 3a 20	..Content-Type:
0180	74 65 78 74 2f 68 74 6d 6c 3b 20 63 68 61 72 73	text/html; 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>.Congratulatio
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 the 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.edu/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!.</html>.

В цілому всі заголовки відображаються, крім найперших байт:

- 1) 8...0`W.O....E.@.....l.w.....PX..>.2..P. ...<..
- 2) `W.O..`8...0..E. ..ek@.1....w.... l.P...2..X...P. ...]..

8-11						
No.	Time	Source	Destination	Protocol	Length	Info
85	3.465146	192.168.1.108	128.119.245.12	HTTP	540	GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1

Frame 85: 540 bytes on wire (4320 bits), 540 bytes captured (4320 bits) on interface
 \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0
 Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30
 (60:38:e0:c9:a4:30)
 Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12
 Transmission Control Protocol, Src Port: 6043, Dst Port: 80, Seq: 1, Ack: 1, Len: 486
 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]
 [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/81.0.4044.122 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;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: 136]
 [Next request in frame: 443]

No.	Time	Source	Destination	Protocol	Length	Info
136	3.601854	128.119.245.12	192.168.1.108	HTTP	540	HTTP/1.1
200	OK (text/html)					

Frame 136: 540 bytes on wire (4320 bits), 540 bytes captured (4320 bits) on interface
 \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108

Transmission Control Protocol, Src Port: 80, Dst Port: 6043, Seq: 1, Ack: 487, Len: 486

Hypertext Transfer Protocol

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: Tue, 28 Apr 2020 08:33:26 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11

Perl/v5.16.3\r\n

Last-Modified: Tue, 28 Apr 2020 05:59:03 GMT\r\n

ETag: "80-5a4538757d2f2"\r\n

Accept-Ranges: bytes\r\n

Content-Length: 128\r\n

[Content length: 128]

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: 0.136708000 seconds]

[Request in frame: 85]

[Next request in frame: 443]

[Next response in frame: 446]

[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)

<html>\n

Congratulations. You've downloaded the file \n

http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html!\n

</html>\n

No.	Time	Source	Destination	Protocol	Length	Info
443	3.707035	192.168.1.108	128.119.245.12	HTTP	472	GET /favicon.ico HTTP/1.1

Frame 443: 472 bytes on wire (3776 bits), 472 bytes captured (3776 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)
Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 6043, Dst Port: 80, Seq: 487, Ack: 487, Len: 418
Hypertext Transfer Protocol
GET /favicon.ico HTTP/1.1\r\n
[Expert Info (Chat/Sequence): GET /favicon.ico HTTP/1.1\r\n]
[GET /favicon.ico HTTP/1.1\r\n]
[Severity level: Chat]
[Group: Sequence]
Request Method: GET
Request URI: /favicon.ico
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/81.0.4044.122 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-file1.html\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/favicon.ico]
[HTTP request 2/2]
[Prev request in frame: 85]
[Response in frame: 446]

No.	Time	Source	Destination	Protocol	Length	Info
446	3.828670	128.119.245.12	192.168.1.108	HTTP	538	HTTP/1.1
404	Not Found (text/html)					

Frame 446: 538 bytes on wire (4304 bits), 538 bytes captured (4304 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108

Transmission Control Protocol, Src Port: 80, Dst Port: 6043, Seq: 487, Ack: 905, Len: 484

Hypertext Transfer Protocol

HTTP/1.1 404 Not Found\r\n

[Expert Info (Chat/Sequence): HTTP/1.1 404 Not Found\r\n]

[HTTP/1.1 404 Not Found\r\n]

[Severity level: Chat]

[Group: Sequence]

Response Version: HTTP/1.1

Status Code: 404

[Status Code Description: Not Found]

Response Phrase: Not Found

Date: Tue, 28 Apr 2020 08:33:26 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11

Perl/v5.16.3\r\n

Content-Length: 209\r\n

[Content length: 209]

Keep-Alive: timeout=5, max=99\r\n

Connection: Keep-Alive\r\n

Content-Type: text/html; charset=iso-8859-1\r\n

\r\n

[HTTP response 2/2]

[Time since request: 0.121635000 seconds]

[Prev request in frame: 85]

[Prev response in frame: 136]

[Request in frame: 443]

[Request URI: http://gaia.cs.umass.edu/favicon.ico]

File Data: 209 bytes

Line-based text data: text/html (7 lines)

<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">\n

<html><head>\n

<title>404 Not Found</title>\n

</head><body>\n

<h1>Not Found</h1>\n

<p>The requested URL /favicon.ico was not found on this server.</p>\n

</body></html>\n

No.	Time	Source	Destination	Protocol	Length	Info
468	10.814863	192.168.1.108	128.119.245.12	HTTP	651	GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1

Frame 468: 651 bytes on wire (5208 bits), 651 bytes captured (5208 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

```

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30
(60:38:e0:c9:a4:30)
Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 6047, Dst Port: 80, Seq: 1, Ack: 1, Len: 597
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]
      [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
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36
(KHTML, like Gecko) Chrome/81.0.4044.122 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;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: "80-5a4538757d2f2"\r\n
If-Modified-Since: Tue, 28 Apr 2020 05:59:03 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: 470]

```

No.	Time	Source	Destination	Protocol	Length	Info
470	10.945739	128.119.245.12	192.168.1.108	HTTP	293	HTTP/1.1 304 Not Modified

Frame 470: 293 bytes on wire (2344 bits), 293 bytes captured (2344 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

```
Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108
Transmission Control Protocol, Src Port: 80, Dst Port: 6047, Seq: 1, Ack: 598, Len: 239
Hypertext Transfer Protocol
  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: Tue, 28 Apr 2020 08:33:33 GMT\r\n
    Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11
    Perl/v5.16.3\r\n
    Connection: Keep-Alive\r\n
    Keep-Alive: timeout=5, max=100\r\n
    ETag: "80-5a4538757d2f2"\r\n
    \r\n
    [HTTP response 1/1]
    [Time since request: 0.130876000 seconds]
    [Request in frame: 468]
    [Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]
```

8. Перевірте вміст першого запиту HTTP GET від вашого браузера до сервера. Чи є в ньому заголовок IF-MODIFIED-SINCE?

Відсутній

9. Перевірте вміст першої відповіді сервера. Чи повернув сервер вміст файлу безпосередньо у відповіді?

Повернув:

Line-based text data: text/html (4 lines)

<html>\n

Congratulations. You've downloaded the file \n

http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html!\n

</html>\n

10. Перевірте вміст другого запиту HTTP GET. Чи є в ньому заголовок IF-MODIFIED-SINCE? Якщо так, яке значення йому відповідає?

If-Modified-Since: Tue, 28 Apr 2020 05:59:03 GMT\r\n

11. Який код та опис статусу другої відповіді сервера? Чи повернув сервер вміст файлу безпосередньо у відповіді?

HTTP/1.1 304 Not Modified\r\n
Status Code: 304

Не повернув.

Запитання 12-15

(Роздруківки пакетів нижче)

<http://icons.iconarchive.com/icons/paomedia/small-n-flat/1024/gift-icon.png>

12. Скільки повідомлень HTTP GET було відправлено вашим браузером?

Одне.

GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n
(рис. 2.1)

13. Скільки пакетів TCP було необхідно для доставки одної відповіді HTTP-сервера?

16 Пакетів (рис. 2.2)

[16 Reassembled TCP Segments (23021 bytes): #61(1460), #62(1460), #63(1460), #64(1460), #65(1460), #66(1460), #67(1460), #68(1460), #70(1460), #71(1460), #72(1460), #73(1460), #74(1460), #75(1460), #76(1460), #80(1121)]

[Frame: 61, payload: 0-1459 (1460 bytes)]

[Frame: 62, payload: 1460-2919 (1460 bytes)]

[Frame: 63, payload: 2920-4379 (1460 bytes)]

[Frame: 64, payload: 4380-5839 (1460 bytes)]

[Frame: 65, payload: 5840-7299 (1460 bytes)]

[Frame: 66, payload: 7300-8759 (1460 bytes)]

[Frame: 67, payload: 8760-10219 (1460 bytes)]

[Frame: 68, payload: 10220-11679 (1460 bytes)]

[Frame: 70, payload: 11680-13139 (1460 bytes)]

[Frame: 71, payload: 13140-14599 (1460 bytes)]

[Frame: 72, payload: 14600-16059 (1460 bytes)]

[Frame: 73, payload: 16060-17519 (1460 bytes)]

[Frame: 74, payload: 17520-18979 (1460 bytes)]

[Frame: 75, payload: 18980-20439 (1460 bytes)]

[Frame: 76, payload: 20440-21899 (1460 bytes)]

[Frame: 80, payload: 21900-23020 (1121 bytes)]

[Segment count: 16]

14. Який код та опис статусу був у відповіді сервера?

HTTP/1.1 200 OK\r\n

Status Code: 200

Content-Type: image/png\r\n

Content-Length: 22410\r\n

15. Чи зустрічаються у даних пакетів-продовжень протоколу TCP стрічки з кодом та описом статусу відповіді, або ж якісь заголовки протоколу HTTP?

Відсутні. Лише в першому пакеті. Пакеті №61. (рис. 2.3)

*Беспроводная сеть

Файл Редактирование Просмотр Запуск Захват Анализ Статистика Телефония Беспроводной Инструменты Помощь

ip.src== 104.27.174.238 || ip.src== 104.27.175.238 || ip.dst== 104.27.174.238 || ip.dst== 104.27.175.238

No.	Time	Source	Destination	Protocol	Length	Info
53	3.247261	192.168.1.108	104.27.175.238	TCP	66	36561 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
54	3.247262	192.168.1.108	104.27.175.238	TCP	66	36562 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
55	3.267200	104.27.175.238	192.168.1.108	TCP	66	80 → 36562 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1400 SACK_PERM=1 WS=1024
56	3.267201	104.27.175.238	192.168.1.108	TCP	66	80 → 36561 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1400 SACK_PERM=1 WS=1024
57	3.267343	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=1 Ack=1 Win=262144 Len=0
58	3.267419	192.168.1.108	104.27.175.238	TCP	54	36561 → 80 [ACK] Seq=1 Ack=1 Win=262144 Len=0
59	3.268314	192.168.1.108	104.27.175.238	HTTP	473	GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1
60	3.289441	104.27.175.238	192.168.1.108	TCP	54	80 → 36562 [ACK] Seq=1 Ack=420 Win=67584 Len=0
61	3.298168	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=1 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
62	3.298169	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=1461 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
63	3.298170	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=2921 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
64	3.298172	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=4381 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
65	3.298172	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=5841 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
66	3.298173	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=7301 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
67	3.298173	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=8761 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
68	3.298174	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=10221 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
69	3.298325	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=11681 Win=262144 Len=0
70	3.298865	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=11681 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
71	3.298865	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=13141 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
72	3.298866	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=14601 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
73	3.298868	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=16061 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
74	3.298868	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=17521 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
75	3.298868	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=18981 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
76	3.298869	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=20441 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
77	3.299005	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=21901 Win=262144 Len=0
80	3.301784	104.27.175.238	192.168.1.108	HTTP	1175	HTTP/1.1 200 OK (PNG)
81	3.301932	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=23022 Win=260864 Len=0
94	3.451834	192.168.1.108	104.27.175.238	TCP	66	36564 → 80 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1

Hypertext Transfer Protocol

- GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n
 - [Expert Info (Chat/Sequence): GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n]
 - [GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n]
 - [Severity level: Chat]
 - [Group: Sequence]
 - Request Method: GET
 - Request URI: /icons/paomedia/small-n-flat/1024/gift-icon.png
 - Request Version: HTTP/1.1
 - Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
 - Accept-Language: ru-RU\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/70.0.3538.102 Safari/537.36 Edge/18.18362\r\n
 - Accept-Encoding: gzip, deflate\r\n
 - Host: icons.iconarchive.com\r\n

Рис. 2.1. Запит GET на отримання зображення

Беспроводная сеть

Файл Редактирование Просмотр Запуск Захват Анализ Статистика Телефония Беспроводной Инструменты Помощь

ip.src== 104.27.174.238 || ip.src== 104.27.175.238 || ip.dst== 104.27.174.238 || ip.dst== 104.27.175.238

No.	Time	Source	Destination	Protocol	Length	Info
59	3.268314	192.168.1.108	104.27.175.238	HTTP	473	GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1
60	3.289441	104.27.175.238	192.168.1.108	TCP	54	80 → 36562 [ACK] Seq=1 Ack=420 Win=67584 Len=0
61	3.298168	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=1 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
62	3.298169	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=1461 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
63	3.298170	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=2921 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
64	3.298172	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=4381 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
65	3.298172	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=5841 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
66	3.298173	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=7301 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
67	3.298173	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=8761 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
68	3.298174	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=10221 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
69	3.298325	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=11681 Win=262144 Len=0
70	3.298865	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=11681 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
71	3.298865	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=13141 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
72	3.298866	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=14601 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
73	3.298868	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=16061 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
74	3.298868	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=17521 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
75	3.298868	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=18981 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
76	3.298869	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=20441 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
77	3.299005	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=21901 Win=262144 Len=0
80	3.301784	104.27.175.238	192.168.1.108	HTTP	1175	HTTP/1.1 200 OK (PNG)
81	3.301932	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=23022 Win=260864 Len=0

[Time since first frame in this TCP stream: 0.054522000 seconds]
[Time since previous frame in this TCP stream: 0.002779000 seconds]

TCP payload (1121 bytes)
TCP segment data (1121 bytes)

✓ [16 Reassembled TCP Segments (23021 bytes): #61(1460), #62(1460), #63(1460), #64(1460), #65(1460), #66(1460), #67(1460), #68(1460), #70(1460), #71(1460), #72(1460), #73(1460), #74(1460), #75(1460), #76(1460), #80(1121)]

[Frame: 61, payload: 0-1459 (1460 bytes)]
[Frame: 62, payload: 1460-2919 (1460 bytes)]
[Frame: 63, payload: 2920-4379 (1460 bytes)]
[Frame: 64, payload: 4380-5839 (1460 bytes)]
[Frame: 65, payload: 5840-7299 (1460 bytes)]
[Frame: 66, payload: 7300-8759 (1460 bytes)]
[Frame: 67, payload: 8760-10219 (1460 bytes)]
[Frame: 68, payload: 10220-11679 (1460 bytes)]
[Frame: 70, payload: 11680-13139 (1460 bytes)]
[Frame: 71, payload: 13140-14599 (1460 bytes)]
[Frame: 72, payload: 14600-16059 (1460 bytes)]
[Frame: 73, payload: 16060-17519 (1460 bytes)]
[Frame: 74, payload: 17520-18979 (1460 bytes)]
[Frame: 75, payload: 18980-20439 (1460 bytes)]
[Frame: 76, payload: 20440-21899 (1460 bytes)]
[Frame: 80, payload: 21900-23020 (1121 bytes)]

[Segment count: 16]
[Reassembled TCP length: 23021]
[Reassembled TCP Data: 485454502f312e3120323030204f4b0d0a4461746553a2057...]

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

0020 01 6c 00 50 8e d2 8a 01 e6 a2 a2 bd ff 8c 50 18 .1.P.....P.
0030 00 42 00 18 00 00 1e 25 79 ff ee e5 4b ff 3b c9 .B.....%y...K.;.

Frame (1175 bytes) Reassembled TCP (23021 bytes)

Рис. 2.2. Відповідь сервера “200 OK” про передачу всього пакету

*Беспроводная сеть

Файл Редактирование Просмотр Запуск Захват Анализ Статистика Телефония Беспроводной Инструменты Помощь

ip.src== 104.27.174.238 || ip.src== 104.27.175.238 || ip.dst== 104.27.174.238 || ip.dst== 104.27.175.238

No.	Time	Source	Destination	Protocol	Length	Info
60	3.289441	104.27.175.238	192.168.1.108	TCP	54	80 → 36562 [ACK] Seq=1 Ack=420 Win=67584 Len=0
61	3.298168	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=1 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
62	3.298169	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=1461 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
63	3.298170	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=2921 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
64	3.298172	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=4381 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
65	3.298172	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=5841 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
66	3.298173	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=7301 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
67	3.298173	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=8761 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
68	3.298174	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=10221 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
69	3.298325	192.168.1.108	104.27.175.238	TCP	54	36562 → 80 [ACK] Seq=420 Ack=11681 Win=262144 Len=0
70	3.298865	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [PSH, ACK] Seq=11681 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]
71	3.298865	104.27.175.238	192.168.1.108	TCP	1514	80 → 36562 [ACK] Seq=13141 Ack=420 Win=67584 Len=1460 [TCP segment of a reassembled PDU]

[Stream index: 1]
 [TCP Segment Len: 1460]
 Sequence number: 1 (relative sequence number)
 Sequence number (raw): 2315358486
 [Next sequence number: 1461 (relative sequence number)]
 Acknowledgment number: 420 (relative ack number)
 Acknowledgment number (raw): 2730360716
 0101 = Header Length: 20 bytes (5)
 > Flags: 0x010 (ACK)
 Window size value: 66
 [Calculated window size: 67584]
 [Window size scaling factor: 1024]
 Checksum: 0x7e6f [unverified]

```

0000  60 57 18 4f 90 fc 60 38 e0 c9 a4 30 08 00 45 00  `W.O..`8 ...0..E.
0010  05 dc 3b d0 40 00 3b 06 24 2e 68 1b af ee c0 a8  .;.@;.`$.h....
0020  01 6c 00 50 8e d2 8a 01 91 16 a2 bd ff 8c 50 10  .l.P.... .....P.
0030  00 42 7e 6f 00 00 48 54 54 50 2f 31 2e 31 20 32  .B~o..HT TP/1.1 2
0040  30 30 20 4f 4b 0d 0a 44 61 74 65 3a 20 57 65 64  00 OK..D ate: Wed
0050  2c 20 32 39 20 41 70 72 20 32 30 32 30 20 30 35  , 29 Apr 2020 05
0060  3a 34 37 3a 33 31 20 47 4d 54 0d 0a 43 6f 6e 74  :47:31 G MT..Cont
0070  65 6e 74 2d 54 79 70 65 3a 20 69 6d 61 67 65 2f  ent-Type : image/
0080  70 6e 67 0d 0a 43 6f 6e 74 65 6e 74 2d 4c 65 6e  png..Con tent-Len
0090  67 74 68 3a 20 32 32 34 31 30 0d 0a 43 6f 6e 6e  gth: 224 10..Conn
00a0  65 63 74 69 6f 6e 3a 20 6b 65 65 70 2d 61 6c 69  ection: keep-ali
00b0  76 65 0d 0a 53 65 74 2d 43 6f 6f 6b 69 65 3a 20  ve..Set- Cookie:
00c0  5f 5f 63 66 64 75 69 64 3d 64 30 64 61 32 65 33  _cfduid =d0da2e3
00d0  38 38 37 38 32 63 31 33 61 31 32 61 30 64 64 62  88782c13 a12a0ddb
00e0  61 35 66 65 66 36 32 35 34 37 31 35 38 38 31 33  a5fef625 47158813
00f0  39 32 35 31 3b 20 65 78 70 69 72 65 73 3d 46 72  9251; ex pires=Fr
0100  69 2c 20 32 39 2d 4d 61 79 2d 32 30 20 30 35 3a  i, 29-Ma y-20 05:
0110  34 37 3a 33 31 20 47 4d 54 3b 20 70 61 74 68 3d  47:31 GM T; path=
0120  2f 3b 20 64 6f 6d 61 69 6e 3d 2e 69 63 6f 6e 61  /; domai n=.icona
0130  72 63 68 69 76 65 2e 63 6f 6d 3b 20 48 74 74 70  rchive.c om; Http
  
```

Рис. 2.3. Заголовки HTTP лишь в першому пакеті (№61)

Запитання 12-15

No.	Time	Source	Destination	Protocol	Length	Info
59	3.268314	192.168.1.108	104.27.175.238	HTTP	473	GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1

Frame 59: 473 bytes on wire (3784 bits), 473 bytes captured (3784 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 08:47:32.519372000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588139252.519372000 seconds

[Time delta from previous captured frame: 0.000895000 seconds]

[Time delta from previous displayed frame: 0.000895000 seconds]

[Time since reference or first frame: 3.268314000 seconds]

Frame Number: 59

Frame Length: 473 bytes (3784 bits)

Capture Length: 473 bytes (3784 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Destination: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

.... ..0. = LG bit: Globally unique address (factory default)

.... ..0 = IG bit: Individual address (unicast)

Source: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

.... ..0. = LG bit: Globally unique address (factory default)

.... ..0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 192.168.1.108, Dst: 104.27.175.238

0100 = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 459

Identification: 0x6174 (24948)

Flags: 0x4000, Don't fragment
0... = Reserved bit: Not set
.1.. = Don't fragment: Set
..0. = More fragments: Not set

Fragment offset: 0

Time to live: 128

Protocol: TCP (6)

Header checksum: 0xbd9a [validation disabled]

[Header checksum status: Unverified]

Source: 192.168.1.108

Destination: 104.27.175.238

Transmission Control Protocol, Src Port: 36562, Dst Port: 80, Seq: 1, Ack: 1, Len: 419

Source Port: 36562

Destination Port: 80

[Stream index: 1]

[TCP Segment Len: 419]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 2730360297

[Next sequence number: 420 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Acknowledgment number (raw): 2315358486

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ...1 = Acknowledgment: Set

.... 1... = Push: Set

....0.. = Reset: Not set

....0. = Syn: Not set

....0 = Fin: Not set

[TCP Flags:AP...]

Window size value: 1024

[Calculated window size: 262144]

[Window size scaling factor: 256]

Checksum: 0xa723 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.020081000 seconds]

[Bytes in flight: 419]

[Bytes sent since last PSH flag: 419]

[Timestamps]

[Time since first frame in this TCP stream: 0.021052000 seconds]

[Time since previous frame in this TCP stream: 0.000971000 seconds]

TCP payload (419 bytes)

Hypertext Transfer Protocol

GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n

[Expert Info (Chat/Sequence): GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n]

[GET /icons/paomedia/small-n-flat/1024/gift-icon.png HTTP/1.1\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Method: GET

Request URI: /icons/paomedia/small-n-flat/1024/gift-icon.png

Request Version: HTTP/1.1

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n

Accept-Language: ru-RU\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/70.0.3538.102 Safari/537.36 Edge/18.18362\r\n

Accept-Encoding: gzip, deflate\r\n

Host: icons.iconarchive.com\r\n

Connection: Keep-Alive\r\n

\r\n

[Full request URI: http://icons.iconarchive.com/icons/paomedia/small-n-flat/1024/gift-icon.png]

[HTTP request 1/1]

[Response in frame: 80]

No.	Time	Source	Destination	Protocol	Length	Info
80	3.301784	104.27.175.238	192.168.1.108	HTTP	1175	HTTP/1.1
200	OK (PNG)					

Frame 80: 1175 bytes on wire (9400 bits), 1175 bytes captured (9400 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 08:47:32.552842000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588139252.552842000 seconds

[Time delta from previous captured frame: 0.001620000 seconds]

[Time delta from previous displayed frame: 0.002779000 seconds]

[Time since reference or first frame: 3.301784000 seconds]

Frame Number: 80

Frame Length: 1175 bytes (9400 bits)

Capture Length: 1175 bytes (9400 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http:png]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Destination: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

....0. = LG bit: Globally unique address (factory default)

....0. = IG bit: Individual address (unicast)

Source: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

....0. = LG bit: Globally unique address (factory default)

....0. = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 104.27.175.238, Dst: 192.168.1.108

0100 = Version: 4

....0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

....00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 1161

Identification: 0x3bdf (15327)

Flags: 0x4000, Don't fragment

0... = Reserved bit: Not set

.1.. = Don't fragment: Set

..0. = More fragments: Not set

Fragment offset: 0

Time to live: 59

Protocol: TCP (6)

Header checksum: 0x2572 [validation disabled]

[Header checksum status: Unverified]

Source: 104.27.175.238

Destination: 192.168.1.108

Transmission Control Protocol, Src Port: 80, Dst Port: 36562, Seq: 21901, Ack: 420, Len: 1121

Source Port: 80

Destination Port: 36562

[Stream index: 1]

[TCP Segment Len: 1121]

Sequence number: 21901 (relative sequence number)

Sequence number (raw): 2315380386

[Next sequence number: 23022 (relative sequence number)]

Acknowledgment number: 420 (relative ack number)

Acknowledgment number (raw): 2730360716

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ...1 = Acknowledgment: Set

.... 1... = Push: Set

....0.. = Reset: Not set

....0. = Syn: Not set

....0 = Fin: Not set

[TCP Flags:AP...]

Window size value: 66

[Calculated window size: 67584]

[Window size scaling factor: 1024]

Checksum: 0x0018 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.020081000 seconds]

[Bytes in flight: 1121]

[Bytes sent since last PSH flag: 1121]

[Timestamps]

[Time since first frame in this TCP stream: 0.054522000 seconds]

[Time since previous frame in this TCP stream: 0.002779000 seconds]

TCP payload (1121 bytes)

TCP segment data (1121 bytes)

[16 Reassembled TCP Segments (23021 bytes): #61(1460), #62(1460), #63(1460), #64(1460), #65(1460), #66(1460), #67(1460), #68(1460), #70(1460), #71(1460), #72(1460), #73(1460), #74(1460), #75(1460), #76(1460), #80(1121)]

[Frame: 61, payload: 0-1459 (1460 bytes)]

[Frame: 62, payload: 1460-2919 (1460 bytes)]

[Frame: 63, payload: 2920-4379 (1460 bytes)]

[Frame: 64, payload: 4380-5839 (1460 bytes)]

[Frame: 65, payload: 5840-7299 (1460 bytes)]

[Frame: 66, payload: 7300-8759 (1460 bytes)]

[Frame: 67, payload: 8760-10219 (1460 bytes)]

[Frame: 68, payload: 10220-11679 (1460 bytes)]

[Frame: 70, payload: 11680-13139 (1460 bytes)]

[Frame: 71, payload: 13140-14599 (1460 bytes)]

[Frame: 72, payload: 14600-16059 (1460 bytes)]

[Frame: 73, payload: 16060-17519 (1460 bytes)]

[Frame: 74, payload: 17520-18979 (1460 bytes)]

[Frame: 75, payload: 18980-20439 (1460 bytes)]

[Frame: 76, payload: 20440-21899 (1460 bytes)]

[Frame: 80, payload: 21900-23020 (1121 bytes)]

[Segment count: 16]

[Reassembled TCP length: 23021]

[Reassembled

TCP

Data:

485454502f312e3120323030204f4b0d0a446174653a2057...]

Hypertext Transfer Protocol

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: Wed, 29 Apr 2020 05:47:31 GMT\r\n

Content-Type: image/png\r\n

Content-Length: 22410\r\n

[Content length: 22410]

Connection: keep-alive\r\n

Set-Cookie: __cfduid=d0da2e388782c13a12a0ddba5fef625471588139251;

expires=Fri, 29-May-20 05:47:31 GMT; path=/; domain=.iconarchive.com; HttpOnly;

SameSite=Lax\r\n

Cache-Control: public, max-age=172800\r\n

Expires: Thu, 30 Apr 2020 10:51:16 GMT\r\n

ETag: "1556850846"\r\n

Last-Modified: Wed, 14 Dec 2016 23:19:21 GMT\r\n

CF-Cache-Status: HIT\r\n

Age: 68175\r\n

Accept-Ranges: bytes\r\n

Vary: Accept-Encoding\r\n

Server: cloudflare\r\n

CF-RAY: 58b6ba908b8d696d-DME\r\n

cf-request-id: 026612ee530000696dc78a2200000001\r\n

\r\n

[HTTP response 1/1]

[Time since request: 0.033470000 seconds]

[Request in frame: 59]

[Request URI: http://icons.iconarchive.com/icons/paomedia/small-n-flat/1024/gift-icon.png]

File Data: 22410 bytes

Portable Network Graphics

PNG Signature: 89504e470d0a1a0a

Image Header (IHDR)

Len: 13

Chunk: IHDR

..0. = Ancillary: This is a CRITICAL chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..0. = Safe To Copy: This chunk is NOT safe to copy

Width: 1024

Height: 1024

Bit Depth: 8

Colour Type: Truecolour with alpha (6)

Compression Method: Deflate (0)

Filter Method: Adaptive (0)

Interlace Method: No interlace (0)

CRC: 0x7f1d2b83

Significant bits (sBIT)

Len: 4

Chunk: sBIT

..1. = Ancillary: This is an ANCILLARY chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..0. = Safe To Copy: This chunk is NOT safe to copy

Data

CRC: 0x7c086488

Physical pixel dimensions (pHYs)

Len: 9

Chunk: pHYs

..1. = Ancillary: This is an ANCILLARY chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..1. = Safe To Copy: This chunk is SAFE TO COPY

Horizontal pixels per unit: 151181

Vertical pixels per unit: 151181

Unit: Unit is METRE (1)

CRC: 0x407a96bc

Textual data (tEXt)

Len: 25

Chunk: tEXt

..1. = Ancillary: This is an ANCILLARY chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..1. = Safe To Copy: This chunk is SAFE TO COPY

Keyword: Software

String: www.inkscape.org

CRC: 0x9bee3c1a

Image data chunk (IDAT)

Len: 8192

Chunk: IDAT

..0. = Ancillary: This is a CRITICAL chunk
.....0. = Private: This is a PUBLIC chunk
.....0. = Safe To Copy: This chunk is NOT safe to copy

Data

CRC: 0xf6e1ff17

Image data chunk (IDAT)

Len: 8192

Chunk: IDAT

..0. = Ancillary: This is a CRITICAL chunk
.....0. = Private: This is a PUBLIC chunk
.....0. = Safe To Copy: This chunk is NOT safe to copy

Data

CRC: 0xde59ca68

Image data chunk (IDAT)

Len: 5871

Chunk: IDAT

..0. = Ancillary: This is a CRITICAL chunk
.....0. = Private: This is a PUBLIC chunk
.....0. = Safe To Copy: This chunk is NOT safe to copy

Data

CRC: 0x67728645

Image Trailer (IEND)

Len: 0

Chunk: IEND

..0. = Ancillary: This is a CRITICAL chunk
.....0. = Private: This is a PUBLIC chunk
.....0. = Safe To Copy: This chunk is NOT safe to copy

CRC: 0xae426082

16. Скільки запитів HTTP GET було відправлено вашим браузером? Якими були цільові IP-адреси запитів?

Три (рис. 2.4.). GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1\r\n

GET /~kurose/cover_5th_ed.jpg HTTP/1.1\r\n GET /pearson.png HTTP/1.1\r\n

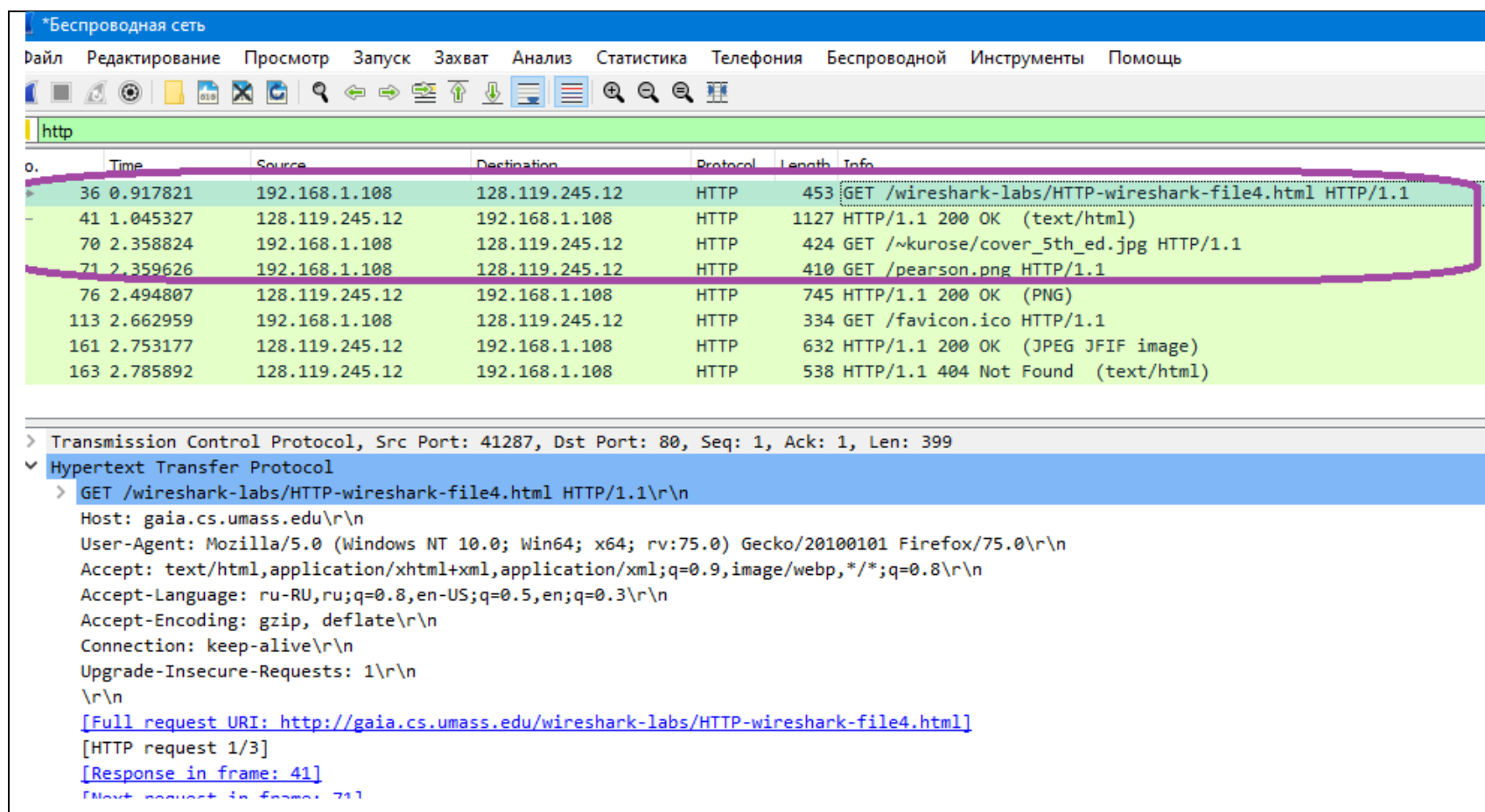


Рис. 2.4. Три Запити GET

17. Чи можете ви встановити, чи були ресурси отримані паралельно чи послідовно? Яким чином?

Послідовно (рис 2.5.). В даному випадку спочатку був отриман ресурс pearson.png (Фрейм 74,75, 76)

[3 Reassembled TCP Segments (3611 bytes): #74(1460), #75(1460), #76(691)]

[Frame: 74, payload: 0-1459 (1460 bytes)]

[Frame: 75, payload: 1460-2919 (1460 bytes)]

[Frame: 76, payload: 2920-3610 (691 bytes)]

[Segment count: 3]

[Reassembled TCP length: 3611]

А потім одразу з 77-го відбувалося отримання ~/kurose/cover_5th_ed.jpg

[70 Reassembled TCP Segments (101318 bytes): #77(1460), #78(1460), #79(1460), #80(1460), #81(1460), #82(1460), #85(1460), #86(1460), #87(1460), #88(1460), #90(1460), #91(1460), #92(1460), #93(1460), #94(1460), #95(1460), #97(1460), #98(1460)]

*Беспроводная сеть						
Файл Редактирование Просмотр Запуск Захват Анализ Статистика Телефония Беспроводной Инструменты Помощь						
ip.src== 128.119.245.12 ip.dst== 128.119.245.12						
No.	Time	Source	Destination	Protocol	Length	Info
25	0.799831	192.168.1.108	128.119.245.12	TCP	66	41287 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
34	0.916132	128.119.245.12	192.168.1.108	TCP	66	80 → 41287 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PERM=1 WS=128
35	0.916235	192.168.1.108	128.119.245.12	TCP	54	41287 → 80 [ACK] Seq=1 Ack=1 Win=131328 Len=0
36	0.917821	192.168.1.108	128.119.245.12	HTTP	453	GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
40	1.034722	128.119.245.12	192.168.1.108	TCP	54	80 → 41287 [ACK] Seq=1 Ack=400 Win=30336 Len=0
41	1.045327	128.119.245.12	192.168.1.108	HTTP	1127	HTTP/1.1 200 OK (text/html)
43	1.085199	192.168.1.108	128.119.245.12	TCP	54	41287 → 80 [ACK] Seq=400 Ack=1074 Win=130304 Len=0
57	1.539621	192.168.1.108	128.119.245.12	TCP	66	41288 → 80 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
59	1.655905	128.119.245.12	192.168.1.108	TCP	66	80 → 41288 [SYN, ACK] Seq=0 Ack=1 Win=29200 Len=0 MSS=1460 SACK_PERM=1 WS=128
60	1.656001	192.168.1.108	128.119.245.12	TCP	54	41288 → 80 [ACK] Seq=1 Ack=1 Win=131328 Len=0
70	2.358824	192.168.1.108	128.119.245.12	HTTP	424	GET ~/kurose/cover_5th_ed.jpg HTTP/1.1
71	2.359626	192.168.1.108	128.119.245.12	HTTP	410	GET /pearson.png HTTP/1.1
73	2.481210	128.119.245.12	192.168.1.108	TCP	54	80 → 41288 [ACK] Seq=1 Ack=371 Win=30336 Len=0
74	2.494806	128.119.245.12	192.168.1.108	TCP	1514	80 → 41287 [ACK] Seq=1074 Ack=756 Win=31360 Len=1460 [TCP segment of a reassembled PDU]
75	2.494807	128.119.245.12	192.168.1.108	TCP	1514	80 → 41287 [ACK] Seq=2534 Ack=756 Win=31360 Len=1460 [TCP segment of a reassembled PDU]
76	2.494807	128.119.245.12	192.168.1.108	HTTP	745	HTTP/1.1 200 OK (PNG)
77	2.494808	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=1 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
78	2.494810	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=1461 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
79	2.494811	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=2921 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
80	2.494811	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=4381 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
81	2.494812	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=5841 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
82	2.494812	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=7301 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
83	2.495034	192.168.1.108	128.119.245.12	TCP	54	41287 → 80 [ACK] Seq=756 Ack=4685 Win=131328 Len=0
84	2.495120	192.168.1.108	128.119.245.12	TCP	54	41288 → 80 [ACK] Seq=371 Ack=8761 Win=131328 Len=0
85	2.495442	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=8761 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
86	2.495443	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=10221 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
87	2.495443	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=11681 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
88	2.495445	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=13141 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
89	2.495510	192.168.1.108	128.119.245.12	TCP	54	41288 → 80 [ACK] Seq=371 Ack=14601 Win=131328 Len=0
90	2.613917	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=14601 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
91	2.613918	128.119.245.12	192.168.1.108	TCP	1514	80 → 41288 [ACK] Seq=16061 Ack=371 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
> Frame 77: 1514 bytes on wire (12112 bits), 1514 bytes captured (12112 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0 > Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc) > Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108 > Transmission Control Protocol, Src Port: 80, Dst Port: 41288, Seq: 1, Ack: 371, Len: 1460						

Рис. 2.5 Послідовність отримання ресурсів

16-17

No.	Time	Source	Destination	Protocol	Length	Info
36	0.917821	192.168.1.108	128.119.245.12	HTTP	453	GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1

Frame 36: 453 bytes on wire (3624 bits), 453 bytes captured (3624 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 10:52:21.575121000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588146741.575121000 seconds

[Time delta from previous captured frame: 0.001586000 seconds]

[Time delta from previous displayed frame: 0.000000000 seconds]

[Time since reference or first frame: 0.917821000 seconds]

Frame Number: 36

Frame Length: 453 bytes (3624 bits)

Capture Length: 453 bytes (3624 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Destination: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

.... ..0. = LG bit: Globally unique address (factory default)

.... ..0 = IG bit: Individual address (unicast)

Source: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

.... ..0. = LG bit: Globally unique address (factory default)

.... ..0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12

0100 = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 439

Identification: 0x0ce1 (3297)

Flags: 0x4000, Don't fragment
0... = Reserved bit: Not set
.1.. = Don't fragment: Set
..0. = More fragments: Not set

Fragment offset: 0

Time to live: 128

Protocol: TCP (6)

Header checksum: 0xb4c7 [validation disabled]

[Header checksum status: Unverified]

Source: 192.168.1.108

Destination: 128.119.245.12

Transmission Control Protocol, Src Port: 41287, Dst Port: 80, Seq: 1, Ack: 1, Len: 399

Source Port: 41287

Destination Port: 80

[Stream index: 2]

[TCP Segment Len: 399]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 4114645580

[Next sequence number: 400 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Acknowledgment number (raw): 2144254570

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ...1 = Acknowledgment: Set

.... 1... = Push: Set

....0.. = Reset: Not set

....0. = Syn: Not set

....0 = Fin: Not set

[TCP Flags:AP...]

Window size value: 513

[Calculated window size: 131328]

[Window size scaling factor: 256]

Checksum: 0x7ae0 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.116404000 seconds]

[Bytes in flight: 399]

[Bytes sent since last PSH flag: 399]

[Timestamps]

[Time since first frame in this TCP stream: 0.117990000 seconds]

[Time since previous frame in this TCP stream: 0.001586000 seconds]

TCP payload (399 bytes)

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]

[GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Method: GET

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

Request Version: HTTP/1.1

Host: gaia.cs.umass.edu\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:75.0) Gecko/20100101 Firefox/75.0\r\n

Accept:

text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n

Accept-Language: ru-RU,ru;q=0.8,en-US;q=0.5,en;q=0.3\r\n

Accept-Encoding: gzip, deflate\r\n

Connection: keep-alive\r\n

Upgrade-Insecure-Requests: 1\r\n

\r\n

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

[HTTP request 1/3]

[Response in frame: 41]

[Next request in frame: 71]

No.	Time	Source	Destination	Protocol	Length	Info
41	1.045327	128.119.245.12	192.168.1.108	HTTP	1127	HTTP/1.1 200 OK (text/html)

Frame 41: 1127 bytes on wire (9016 bits), 1127 bytes captured (9016 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 10:52:21.702627000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588146741.702627000 seconds

[Time delta from previous captured frame: 0.010605000 seconds]

[Time delta from previous displayed frame: 0.127506000 seconds]

[Time since reference or first frame: 1.045327000 seconds]

Frame Number: 41

Frame Length: 1127 bytes (9016 bits)

Capture Length: 1127 bytes (9016 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http:data-text-lines]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Destination: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Source: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108

0100 = Version: 4

....0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

....00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 1113

Identification: 0x8dd2 (36306)

Flags: 0x4000, Don't fragment

0... = Reserved bit: Not set

.1.. = Don't fragment: Set

..0. = More fragments: Not set

Fragment offset: 0

Time to live: 50

Protocol: TCP (6)

Header checksum: 0x7f34 [validation disabled]

[Header checksum status: Unverified]

Source: 128.119.245.12

Destination: 192.168.1.108

Transmission Control Protocol, Src Port: 80, Dst Port: 41287, Seq: 1, Ack: 400, Len: 1073

Source Port: 80

Destination Port: 41287

[Stream index: 2]

[TCP Segment Len: 1073]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 2144254570

[Next sequence number: 1074 (relative sequence number)]

Acknowledgment number: 400 (relative ack number)

Acknowledgment number (raw): 4114645979

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ...1 = Acknowledgment: Set

.... 1... = Push: Set

....0.. = Reset: Not set

....0. = Syn: Not set

....0 = Fin: Not set

[TCP Flags:AP...]

Window size value: 237

[Calculated window size: 30336]

[Window size scaling factor: 128]

Checksum: 0x372a [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.116404000 seconds]

[Bytes in flight: 1073]

[Bytes sent since last PSH flag: 1073]

[Timestamps]

[Time since first frame in this TCP stream: 0.245496000 seconds]

[Time since previous frame in this TCP stream: 0.010605000 seconds]

TCP payload (1073 bytes)

Hypertext Transfer Protocol

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: Wed, 29 Apr 2020 07:52:20 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11

Perl/v5.16.3\r\n

Last-Modified: Wed, 29 Apr 2020 05:59:03 GMT\r\n

ETag: "2ca-5a467a5301df9"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 714\r\n
[Content length: 714]
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: 0.127506000 seconds]
[Request in frame: 36]
[Next request in frame: 71]
[Next response in frame: 76]
[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\n</p>\n<p>This little HTML file is being served by gaia.cs.umass.edu. \nIt contains two embedded images. <br> The image above, also served from the \ngaia.cs.umass.edu web site, is the logo of our publisher, Pearson. <br>\nThe image of our 5th edition book cover below is stored at, and served from, the\nwww server caite.cs.umass.edu:</p>\n<p align="left"></p>\n</body>\n</html>\n
```

No.	Time	Source	Destination	Protocol	Length	Info
70	2.358824	192.168.1.108	128.119.245.12	HTTP	424	GET /~kurose/cover_5th_ed.jpg HTTP/1.1

Frame 70: 424 bytes on wire (3392 bits), 424 bytes captured (3392 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 10:52:23.016124000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588146743.016124000 seconds

[Time delta from previous captured frame: 0.000612000 seconds]

[Time delta from previous displayed frame: 1.313497000 seconds]

[Time since reference or first frame: 2.358824000 seconds]

Frame Number: 70

Frame Length: 424 bytes (3392 bits)

Capture Length: 424 bytes (3392 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Destination: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

.... ..0. = LG bit: Globally unique address (factory default)

.... ..0 = IG bit: Individual address (unicast)

Source: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

.... ..0. = LG bit: Globally unique address (factory default)

.... ..0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12

0100 = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 410

Identification: 0x0ce5 (3301)

Flags: 0x4000, Don't fragment

0... = Reserved bit: Not set

.1.. = Don't fragment: Set
..0. = More fragments: Not set

Fragment offset: 0

Time to live: 128

Protocol: TCP (6)

Header checksum: 0xb4e0 [validation disabled]

[Header checksum status: Unverified]

Source: 192.168.1.108

Destination: 128.119.245.12

Transmission Control Protocol, Src Port: 41288, Dst Port: 80, Seq: 1, Ack: 1, Len: 370

Source Port: 41288

Destination Port: 80

[Stream index: 3]

[TCP Segment Len: 370]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 4153593008

[Next sequence number: 371 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Acknowledgment number (raw): 1413878273

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ...1 = Acknowledgment: Set

.... 1... = Push: Set

....0.. = Reset: Not set

....0. = Syn: Not set

....0 = Fin: Not set

[TCP Flags:AP...]

Window size value: 513

[Calculated window size: 131328]

[Window size scaling factor: 256]

Checksum: 0x212f [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.116380000 seconds]

[Bytes in flight: 370]

[Bytes sent since last PSH flag: 370]

[Timestamps]

[Time since first frame in this TCP stream: 0.819203000 seconds]

[Time since previous frame in this TCP stream: 0.702823000 seconds]

TCP payload (370 bytes)

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]

[GET /~kurose/cover_5th_ed.jpg HTTP/1.1\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Method: GET

Request URI: /~kurose/cover_5th_ed.jpg

Request Version: HTTP/1.1

Host: manic.cs.umass.edu\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:75.0) Gecko/20100101 Firefox/75.0\r\n

Accept: image/webp,*/*\r\n

Accept-Language: ru-RU,ru;q=0.8,en-US;q=0.5,en;q=0.3\r\n

Accept-Encoding: gzip, deflate\r\n

Connection: keep-alive\r\n

Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n\r\n

[Full request URI: http://manic.cs.umass.edu/~kurose/cover_5th_ed.jpg]

[HTTP request 1/1]

[Response in frame: 161]

No.	Time	Source	Destination	Protocol	Length	Info
71	2.359626	192.168.1.108	128.119.245.12	HTTP	410	GET /pearson.png HTTP/1.1

Frame 71: 410 bytes on wire (3280 bits), 410 bytes captured (3280 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 10:52:23.016926000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588146743.016926000 seconds

[Time delta from previous captured frame: 0.000802000 seconds]

[Time delta from previous displayed frame: 0.000802000 seconds]

[Time since reference or first frame: 2.359626000 seconds]

Frame Number: 71

Frame Length: 410 bytes (3280 bits)

Capture Length: 410 bytes (3280 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: IntelCor_4f:90:fc (60:57:18:4f:90:fc), Dst: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Destination: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Source: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 192.168.1.108, Dst: 128.119.245.12

0100 = Version: 4

....0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

....00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 396

Identification: 0x0ce6 (3302)

Flags: 0x4000, Don't fragment

0... = Reserved bit: Not set

.1.. = Don't fragment: Set

..0. = More fragments: Not set

Fragment offset: 0

Time to live: 128

Protocol: TCP (6)

Header checksum: 0xb4ed [validation disabled]

[Header checksum status: Unverified]

Source: 192.168.1.108

Destination: 128.119.245.12

Transmission Control Protocol, Src Port: 41287, Dst Port: 80, Seq: 400, Ack: 1074, Len: 356

Source Port: 41287

Destination Port: 80

[Stream index: 2]

[TCP Segment Len: 356]

Sequence number: 400 (relative sequence number)

Sequence number (raw): 4114645979

[Next sequence number: 756 (relative sequence number)]

Acknowledgment number: 1074 (relative ack number)

Acknowledgment number (raw): 2144255643

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set
...0 = Nonce: Not set
.... 0... = Congestion Window Reduced (CWR): Not set
.... .0.. = ECN-Echo: Not set
.... ..0. = Urgent: Not set
.... ...1 = Acknowledgment: Set
.... 1... = Push: Set
....0.. = Reset: Not set
....0. = Syn: Not set
....0 = Fin: Not set
[TCP Flags:AP...]

Window size value: 509

[Calculated window size: 130304]

[Window size scaling factor: 256]

Checksum: 0xb2a4 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.116404000 seconds]

[Bytes in flight: 356]

[Bytes sent since last PSH flag: 356]

[Timestamps]

[Time since first frame in this TCP stream: 1.559795000 seconds]

[Time since previous frame in this TCP stream: 1.274427000 seconds]

TCP payload (356 bytes)

Hypertext Transfer Protocol

GET /pearson.png HTTP/1.1\r\n

[Expert Info (Chat/Sequence): GET /pearson.png HTTP/1.1\r\n]

[GET /pearson.png HTTP/1.1\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Method: GET

Request URI: /pearson.png

Request Version: HTTP/1.1

Host: gaia.cs.umass.edu\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:75.0) Gecko/20100101

Firefox/75.0\r\n

Accept: image/webp,*/*\r\n

Accept-Language: ru-RU,ru;q=0.8,en-US;q=0.5,en;q=0.3\r\n

Accept-Encoding: gzip, deflate\r\n

Connection: keep-alive\r\n

Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n

\r\n

[Full request URI: http://gaia.cs.umass.edu/pearson.png]

[HTTP request 2/3]

[Prev request in frame: 36]
[Response in frame: 76]
[Next request in frame: 113]

No.	Time	Source	Destination	Protocol	Length	Info
76	2.494807	128.119.245.12	192.168.1.108	HTTP	745	HTTP/1.1
200 OK (PNG)						

Frame 76: 745 bytes on wire (5960 bits), 745 bytes captured (5960 bits) on interface
\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 10:52:23.152107000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588146743.152107000 seconds

[Time delta from previous captured frame: 0.000000000 seconds]

[Time delta from previous displayed frame: 0.135181000 seconds]

[Time since reference or first frame: 2.494807000 seconds]

Frame Number: 76

Frame Length: 745 bytes (5960 bits)

Capture Length: 745 bytes (5960 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http:png]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Destination: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Source: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108

0100 = Version: 4

....0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

....00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 731
Identification: 0x8dd5 (36309)
Flags: 0x4000, Don't fragment
 0... .. = Reserved bit: Not set
 .1.. .. = Don't fragment: Set
 ..0. = More fragments: Not set

Fragment offset: 0
Time to live: 50
Protocol: TCP (6)
Header checksum: 0x80af [validation disabled]
[Header checksum status: Unverified]
Source: 128.119.245.12
Destination: 192.168.1.108

Transmission Control Protocol, Src Port: 80, Dst Port: 41287, Seq: 3994, Ack: 756, Len: 691

Source Port: 80
Destination Port: 41287
[Stream index: 2]
[TCP Segment Len: 691]
Sequence number: 3994 (relative sequence number)
Sequence number (raw): 2144258563
[Next sequence number: 4685 (relative sequence number)]
Acknowledgment number: 756 (relative ack number)
Acknowledgment number (raw): 4114646335
0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)
 000. = Reserved: Not set
 ...0 = Nonce: Not set
 0... .. = Congestion Window Reduced (CWR): Not set
 0.. = ECN-Echo: Not set
 0. = Urgent: Not set
 1 = Acknowledgment: Set
 1... = Push: Set
 0.. = Reset: Not set
 0. = Syn: Not set
 0 = Fin: Not set
 [TCP Flags:AP...]

Window size value: 245
[Calculated window size: 31360]
[Window size scaling factor: 128]
Checksum: 0xfa3e [unverified]
[Checksum Status: Unverified]
Urgent pointer: 0
[SEQ/ACK analysis]
 [iRTT: 0.116404000 seconds]

[Bytes in flight: 3611]

[Bytes sent since last PSH flag: 3611]

[Timestamps]

[Time since first frame in this TCP stream: 1.694976000 seconds]

[Time since previous frame in this TCP stream: 0.000000000 seconds]

TCP payload (691 bytes)

TCP segment data (691 bytes)

[3 Reassembled TCP Segments (3611 bytes): #74(1460), #75(1460), #76(691)]

[Frame: 74, payload: 0-1459 (1460 bytes)]

[Frame: 75, payload: 1460-2919 (1460 bytes)]

[Frame: 76, payload: 2920-3610 (691 bytes)]

[Segment count: 3]

[Reassembled TCP length: 3611]

[Reassembled

TCP

Data:

485454502f312e3120323030204f4b0d0a446174653a2057...]

Hypertext Transfer Protocol

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: Wed, 29 Apr 2020 07:52:21 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11

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-Length: 3267\r\n

[Content length: 3267]

Keep-Alive: timeout=5, max=99\r\n

Connection: Keep-Alive\r\n

Content-Type: image/png\r\n

\r\n

[HTTP response 2/3]

[Time since request: 0.135181000 seconds]

[Prev request in frame: 36]

[Prev response in frame: 41]

[Request in frame: 71]

[Next request in frame: 113]

[Next response in frame: 163]

[Request URI: http://gaia.cs.umass.edu/pearson.png]

File Data: 3267 bytes

Portable Network Graphics

PNG Signature: 89504e470d0a1a0a

Image Header (IHDR)

Len: 13

Chunk: IHDR

..0. = Ancillary: This is a CRITICAL chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..0. = Safe To Copy: This chunk is NOT safe to copy

Width: 253

Height: 199

Bit Depth: 8

Colour Type: Indexed-colour (3)

Compression Method: Deflate (0)

Filter Method: Adaptive (0)

Interlace Method: No interlace (0)

CRC: 0xe50aa505

Palette (PLTE)

Len: 189

Chunk: PLTE

..0. = Ancillary: This is a CRITICAL chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..0. = Safe To Copy: This chunk is NOT safe to copy

Data

CRC: 0xbd86a38a

Image data chunk (IDAT)

Len: 3009

Chunk: IDAT

..0. = Ancillary: This is a CRITICAL chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..0. = Safe To Copy: This chunk is NOT safe to copy

Data

CRC: 0x93ccbcbc

Image Trailer (IEND)

Len: 0

Chunk: IEND

..0. = Ancillary: This is a CRITICAL chunk

.... ..0. = Private: This is a PUBLIC chunk

.... ..0. = Safe To Copy: This chunk is NOT safe to copy

CRC: 0xae426082

No.	Time	Source	Destination	Protocol	Length	Info
161	2.753177	128.119.245.12	192.168.1.108	HTTP	632	HTTP/1.1
200	OK	(JPEG JFIF image)				

Frame 161: 632 bytes on wire (5056 bits), 632 bytes captured (5056 bits) on interface \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}, id 0

Interface id: 0 (\Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2})

Interface name: \Device\NPF_{515AB600-9DD9-44FB-9043-185B381F60A2}

Interface description: Беспроводная сеть

Encapsulation type: Ethernet (1)

Arrival Time: Apr 29, 2020 10:52:23.410477000 Финляндия (лето)

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1588146743.410477000 seconds

[Time delta from previous captured frame: 0.000000000 seconds]

[Time delta from previous displayed frame: 0.090218000 seconds]

[Time since reference or first frame: 2.753177000 seconds]

Frame Number: 161

Frame Length: 632 bytes (5056 bits)

Capture Length: 632 bytes (5056 bits)

[Frame is marked: True]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:tcp:http:image-jfif]

[Coloring Rule Name: HTTP]

[Coloring Rule String: http || tcp.port == 80 || http2]

Ethernet II, Src: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30), Dst: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Destination: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

Address: IntelCor_4f:90:fc (60:57:18:4f:90:fc)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Source: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

Address: BelkinIn_c9:a4:30 (60:38:e0:c9:a4:30)

....0. = LG bit: Globally unique address (factory default)

....0 = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.108

0100 = Version: 4

....0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)

0000 00.. = Differentiated Services Codepoint: Default (0)

....00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 618

Identification: 0x2fa3 (12195)

Flags: 0x4000, Don't fragment

0... = Reserved bit: Not set

.1.. = Don't fragment: Set
..0. = More fragments: Not set

Fragment offset: 0

Time to live: 49

Protocol: TCP (6)

Header checksum: 0xe052 [validation disabled]

[Header checksum status: Unverified]

Source: 128.119.245.12

Destination: 192.168.1.108

Transmission Control Protocol, Src Port: 80, Dst Port: 41288, Seq: 100741, Ack: 371, Len: 578

Source Port: 80

Destination Port: 41288

[Stream index: 3]

[TCP Segment Len: 578]

Sequence number: 100741 (relative sequence number)

Sequence number (raw): 1413979013

[Next sequence number: 101319 (relative sequence number)]

Acknowledgment number: 371 (relative ack number)

Acknowledgment number (raw): 4153593378

0101 = Header Length: 20 bytes (5)

Flags: 0x018 (PSH, ACK)

000. = Reserved: Not set

...0 = Nonce: Not set

.... 0... = Congestion Window Reduced (CWR): Not set

.... .0.. = ECN-Echo: Not set

.... ..0. = Urgent: Not set

.... ...1 = Acknowledgment: Set

.... 1... = Push: Set

....0.. = Reset: Not set

....0. = Syn: Not set

....0 = Fin: Not set

[TCP Flags:AP...]

Window size value: 237

[Calculated window size: 30336]

[Window size scaling factor: 128]

Checksum: 0x6422 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

[SEQ/ACK analysis]

[iRTT: 0.116380000 seconds]

[Bytes in flight: 16638]

[Bytes sent since last PSH flag: 101318]

[Timestamps]

[Time since first frame in this TCP stream: 1.213556000 seconds]

[Time since previous frame in this TCP stream: 0.000000000 seconds]

TCP payload (578 bytes)

TCP segment data (578 bytes)

[70 Reassembled TCP Segments (101318 bytes): #77(1460), #78(1460), #79(1460), #80(1460), #81(1460), #82(1460), #85(1460), #86(1460), #87(1460), #88(1460), #90(1460), #91(1460), #92(1460), #93(1460), #94(1460), #95(1460), #97(1460), #98(1460)]

[Frame: 77, payload: 0-1459 (1460 bytes)]

[Frame: 78, payload: 1460-2919 (1460 bytes)]

[Frame: 79, payload: 2920-4379 (1460 bytes)]

[Frame: 80, payload: 4380-5839 (1460 bytes)]

[Frame: 81, payload: 5840-7299 (1460 bytes)]

[Frame: 82, payload: 7300-8759 (1460 bytes)]

[Frame: 85, payload: 8760-10219 (1460 bytes)]

[Frame: 86, payload: 10220-11679 (1460 bytes)]

[Frame: 87, payload: 11680-13139 (1460 bytes)]

[Frame: 88, payload: 13140-14599 (1460 bytes)]

[Frame: 90, payload: 14600-16059 (1460 bytes)]

[Frame: 91, payload: 16060-17519 (1460 bytes)]

[Frame: 92, payload: 17520-18979 (1460 bytes)]

[Frame: 93, payload: 18980-20439 (1460 bytes)]

[Frame: 94, payload: 20440-21899 (1460 bytes)]

[Frame: 95, payload: 21900-23359 (1460 bytes)]

[Frame: 97, payload: 23360-24819 (1460 bytes)]

[Frame: 98, payload: 24820-26279 (1460 bytes)]

[Frame: 99, payload: 26280-27739 (1460 bytes)]

[Frame: 100, payload: 27740-29199 (1460 bytes)]

[Frame: 101, payload: 29200-30659 (1460 bytes)]

[Frame: 102, payload: 30660-32119 (1460 bytes)]

[Frame: 103, payload: 32120-33579 (1460 bytes)]

[Frame: 104, payload: 33580-35039 (1460 bytes)]

[Frame: 106, payload: 35040-36499 (1460 bytes)]

[Frame: 107, payload: 36500-37959 (1460 bytes)]

[Frame: 108, payload: 37960-39419 (1460 bytes)]

[Frame: 109, payload: 39420-40879 (1460 bytes)]

[Frame: 110, payload: 40880-42339 (1460 bytes)]

[Frame: 111, payload: 42340-43799 (1460 bytes)]

[Frame: 117, payload: 43800-45259 (1460 bytes)]

[Frame: 118, payload: 45260-46719 (1460 bytes)]

[Frame: 120, payload: 46720-48179 (1460 bytes)]

[Frame: 121, payload: 48180-49639 (1460 bytes)]

[Frame: 123, payload: 49640-51099 (1460 bytes)]

[Frame: 124, payload: 51100-52559 (1460 bytes)]

[Frame: 125, payload: 52560-54019 (1460 bytes)]

[Frame: 126, payload: 54020-55479 (1460 bytes)]

[Frame: 128, payload: 55480-56939 (1460 bytes)]
[Frame: 129, payload: 56940-58399 (1460 bytes)]
[Frame: 130, payload: 58400-59859 (1460 bytes)]
[Frame: 131, payload: 59860-61319 (1460 bytes)]
[Frame: 132, payload: 61320-62779 (1460 bytes)]
[Frame: 133, payload: 62780-64239 (1460 bytes)]
[Frame: 135, payload: 64240-65699 (1460 bytes)]
[Frame: 136, payload: 65700-67159 (1460 bytes)]
[Frame: 137, payload: 67160-68619 (1460 bytes)]
[Frame: 138, payload: 68620-70079 (1460 bytes)]
[Frame: 139, payload: 70080-71539 (1460 bytes)]
[Frame: 140, payload: 71540-72999 (1460 bytes)]
[Frame: 141, payload: 73000-74459 (1460 bytes)]
[Frame: 142, payload: 74460-75919 (1460 bytes)]
[Frame: 143, payload: 75920-77379 (1460 bytes)]
[Frame: 144, payload: 77380-78839 (1460 bytes)]
[Frame: 145, payload: 78840-80299 (1460 bytes)]
[Frame: 146, payload: 80300-81759 (1460 bytes)]
[Frame: 147, payload: 81760-83219 (1460 bytes)]
[Frame: 148, payload: 83220-84679 (1460 bytes)]
[Frame: 150, payload: 84680-86139 (1460 bytes)]
[Frame: 151, payload: 86140-87599 (1460 bytes)]
[Frame: 152, payload: 87600-89059 (1460 bytes)]
[Frame: 153, payload: 89060-90519 (1460 bytes)]
[Frame: 154, payload: 90520-91979 (1460 bytes)]
[Frame: 155, payload: 91980-93439 (1460 bytes)]
[Frame: 156, payload: 93440-94899 (1460 bytes)]
[Frame: 157, payload: 94900-96359 (1460 bytes)]
[Frame: 158, payload: 96360-97819 (1460 bytes)]
[Frame: 159, payload: 97820-99279 (1460 bytes)]
[Frame: 160, payload: 99280-100739 (1460 bytes)]
[Frame: 161, payload: 100740-101317 (578 bytes)]
[Segment count: 70]

[Reassembled TCP length: 101318]

[Reassembled

TCP

Data:

485454502f312e3120323030204f4b0d0a4461746553a2057...]

Hypertext Transfer Protocol

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: Wed, 29 Apr 2020 07:52:21 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11
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-Length: 100968\r\n

[Content length: 100968]

Keep-Alive: timeout=5, max=100\r\n

Connection: Keep-Alive\r\n

Content-Type: image/jpeg\r\n

\r\n

[HTTP response 1/1]

[Time since request: 0.394353000 seconds]

[Request in frame: 70]

[Request URI: http://manic.cs.umass.edu/~kurose/cover_5th_ed.jpg]

File Data: 100968 bytes

JPEG File Interchange Format

Marker: Start of Image (0xffd8)

Marker segment: Reserved for application segments - 0 (0xFFE0)

Marker: Reserved for application segments - 0 (0xffe0)

Length: 16

Identifier: JFIF

Version: 1.2

Major Version: 1

Minor Version: 2

Units: Dots per inch (1)

Xdensity: 72

Ydensity: 72

Xthumbnail: 0

Ythumbnail: 0

Marker segment: Reserved for application segments - 1 (0xFFE1)

Marker: Reserved for application segments - 1 (0xffe1)

Length: 9469

Identifier: Exif

Endianness: big endian

Start offset of IFD starting from the TIFF header start: 8 bytes

Number of fields in this IFD: 7

Exif Tag: Orientation (274)

Type: SHORT (3)

Count: 1

Value offset from start of TIFF header: 65536

Exif Tag: XResolution (282)

Type: RATIONAL (5)

Count: 1
Value offset from start of TIFF header: 98
Exif Tag: YResolution (283)
Type: RATIONAL (5)
Count: 1
Value offset from start of TIFF header: 106
Exif Tag: ResolutionUnit (296)
Type: SHORT (3)
Count: 1
Value offset from start of TIFF header: 131072
Exif Tag: Software (305)
Type: ASCII (2)
Count: 28
Value offset from start of TIFF header: 114
Exif Tag: DateTime (306)
Type: ASCII (2)
Count: 20
Value offset from start of TIFF header: 142
Exif Tag: Exif IFD Pointer (34665)
Type: LONG (4)
Count: 1
Value offset from start of TIFF header: 164
Offset to next IFD from start of TIFF header: 208 bytes
Number of fields in this IFD: 6
Exif Tag: Compression (259)
Type: SHORT (3)
Count: 1
Value offset from start of TIFF header: 393216
Exif Tag: XResolution (282)
Type: RATIONAL (5)
Count: 1
Value offset from start of TIFF header: 286
Exif Tag: YResolution (283)
Type: RATIONAL (5)
Count: 1
Value offset from start of TIFF header: 294
Exif Tag: ResolutionUnit (296)
Type: SHORT (3)
Count: 1
Value offset from start of TIFF header: 131072
Exif Tag: JPEGInterchangeFormat (513)
Type: LONG (4)
Count: 1
Value offset from start of TIFF header: 302
Exif Tag: JPEGInterchangeFormatLength (514)

Type: LONG (4)

Count: 1

Value offset from start of TIFF header: 9159

Offset to next IFD from start of TIFF header: 0 bytes

Marker segment: Reserved for application segments - 13 (0xFFED)

Marker: Reserved for application segments - 13 (0xffed)

Length: 10800

Remaining segment data: 10798 bytes

Marker segment: Reserved for application segments - 1 (0xFFE1)

Marker: Reserved for application segments - 1 (0xffe1)

Length: 4046

Identifier: <http://ns.adobe.com/xap/1.0/> (Unknown identifier)

Remaining segment data: 4015 bytes

Marker segment: Reserved for application segments - 2 (0xFFE2)

Marker: Reserved for application segments - 2 (0xffe2)

Length: 3160

Identifier: ICC_PROFILE (Unknown identifier)

Remaining segment data: 3146 bytes

Marker segment: Reserved for application segments - 14 (0xFFEE)

Marker: Reserved for application segments - 14 (0xffee)

Length: 14

Remaining segment data: 12 bytes

Marker segment: Define quantization table(s) (0xFFDB)

Marker: Define quantization table(s) (0xffdb)

Length: 132

Remaining segment data: 130 bytes

Start of Frame header: Start of Frame (non-differential, Huffman coding) - Baseline DCT (0xFFC0)

Marker: Start of Frame (non-differential, Huffman coding) - Baseline DCT (0xffc0)

Length: 17

Sample Precision (bits): 8

Lines: 301

Samples per line: 244

Number of image components in frame: 3

Component identifier: 1

0001 = Horizontal sampling factor: 1

.... 0001 = Vertical sampling factor: 1

Quantization table destination selector: 0

Component identifier: 2

0001 = Horizontal sampling factor: 1

.... 0001 = Vertical sampling factor: 1

Quantization table destination selector: 1

Component identifier: 3

0001 = Horizontal sampling factor: 1

.... 0001 = Vertical sampling factor: 1
 Quantization table destination selector: 1
 Marker segment: Define restart interval (0xFFDD)
 Marker: Define restart interval (0xffdd)
 Length: 4
 Remaining segment data: 2 bytes
 Marker segment: Define Huffman table(s) (0xFFC4)
 Marker: Define Huffman table(s) (0xffc4)
 Length: 418
 Remaining segment data: 416 bytes
 Start of Segment header: Start of Scan (0xFFDA)
 Marker: Start of Scan (0xffda)
 Length: 12
 Number of image components in scan: 3
 Scan component selector: 1
 0000 = DC entropy coding table destination selector: 0
 0000 = AC entropy coding table destination selector: 0
 Scan component selector: 2
 0001 = DC entropy coding table destination selector: 1
 0001 = AC entropy coding table destination selector: 1
 Scan component selector: 3
 0001 = DC entropy coding table destination selector: 1
 0001 = AC entropy coding table destination selector: 1
 Start of spectral or predictor selection: 0
 End of spectral selection: 63
 0000 = Successive approximation bit position high: 0
 0000 = Successive approximation bit position low or point transform: 0
 Entropy-coded segment (dissection is not yet implemented):
 9f7fce057fce057fce277e74ff00ce277e54fe65fe65fe54...
 Marker: Restart interval termination - Restart with modulo 8 count 0 (0xffd0)
 Entropy-coded segment (dissection is not yet implemented):
 f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...
 Marker: Restart interval termination - Restart with modulo 8 count 1 (0xffd1)
 Entropy-coded segment (dissection is not yet implemented):
 f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...
 Marker: Restart interval termination - Restart with modulo 8 count 2 (0xffd2)
 Entropy-coded segment (dissection is not yet implemented):
 f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...
 Marker: Restart interval termination - Restart with modulo 8 count 3 (0xffd3)
 Entropy-coded segment (dissection is not yet implemented):
 f7effcf3ff00584ff233ff00066ffc49f56c55f7c5d5d5...
 Marker: Restart interval termination - Restart with modulo 8 count 4 (0xffd4)
 Entropy-coded segment (dissection is not yet implemented):
 f7effcf3ff00584ff233ff00066ffc49f56c55f47ffce4...
 Marker: Restart interval termination - Restart with modulo 8 count 5 (0xffd5)

Entropy-coded segment (dissection is not yet implemented):
f7effcfae3ff00584ff233ff00066ffc49f56c55f7fe2afc...

Marker: Restart interval termination - Restart with modulo 8 count 6 (0xffd6)

Entropy-coded segment (dissection is not yet implemented):
f7effcfae3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 7 (0xffd7)

Entropy-coded segment (dissection is not yet implemented):
f7effcfae3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 0 (0xffd0)

Entropy-coded segment (dissection is not yet implemented):
f7effcfae3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 1 (0xffd1)

Entropy-coded segment (dissection is not yet implemented):
f875a359da4ba6db492dac323b73e4ec8a49a3b0dc919958...

Marker: Restart interval termination - Restart with modulo 8 count 2 (0xffd2)

Entropy-coded segment (dissection is not yet implemented):
f885a17fc72ad7fe7a7fc9c6ccbc447080f3faefefa5f0fb...

Marker: Restart interval termination - Restart with modulo 8 count 3 (0xffd3)

Entropy-coded segment (dissection is not yet implemented):
f983f9397da5ea3e50d2f48b5fc96d0fce7ab5835cfd775a...

Marker: Restart interval termination - Restart with modulo 8 count 4 (0xffd4)

Entropy-coded segment (dissection is not yet implemented):
f965f927e7bf31f96a1f295a5ee8535f7956e6592dff0048...

Marker: Restart interval termination - Restart with modulo 8 count 5 (0xffd5)

Entropy-coded segment (dissection is not yet implemented):
f98df97f6934bf95be527d2ece0bad4e3b9bc68ae6e8cec2...

Marker: Restart interval termination - Restart with modulo 8 count 6 (0xffd6)

Entropy-coded segment (dissection is not yet implemented):
f915e51d6cff00cabdb5d327d42e66b6862bf59343d1621f...

Marker: Restart interval termination - Restart with modulo 8 count 7 (0xffd7)

Entropy-coded segment (dissection is not yet implemented):
f8d7e53b336be5ed2a51afb452eb72c71bf952ce0bff00ac...

Marker: Restart interval termination - Restart with modulo 8 count 0 (0xffd0)

Entropy-coded segment (dissection is not yet implemented):
f267fce3785ff9531e4f8dc456769707515bcb8215a7b976...

Marker: Restart interval termination - Restart with modulo 8 count 1 (0xffd1)

Entropy-coded segment (dissection is not yet implemented):
f9d3f933f9dde58f2c7907ca9e53b8d0b58d4bcc5a5c5792...

Marker: Restart interval termination - Restart with modulo 8 count 2 (0xffd2)

Entropy-coded segment (dissection is not yet implemented):
f8a3e50b49ae74eb6d334cba820bbd5a669757bd07f796d6...

Marker: Restart interval termination - Restart with modulo 8 count 3 (0xffd3)

Entropy-coded segment (dissection is not yet implemented):
e1ff00f388ff00f3803e57fceffc8df24fe636a9f9953686...

Marker: Restart interval termination - Restart with modulo 8 count 4 (0xffd4)

Entropy-coded segment (dissection is not yet implemented):
9aff00ce05ca21ff009c51fcb07b790c174575c8de60d221...

Marker: Restart interval termination - Restart with modulo 8 count 5 (0xffd5)

Entropy-coded segment (dissection is not yet implemented):
94ff00ce07db349ff38aff00960ed5094d68200dc6bfee7a...

Marker: Restart interval termination - Restart with modulo 8 count 6 (0xffd6)

Entropy-coded segment (dissection is not yet implemented):
2fff009c29f3f0d13fe71a3f2df4cbad3643650aeb08b7c8...

Marker: Restart interval termination - Restart with modulo 8 count 7 (0xffd7)

Entropy-coded segment (dissection is not yet implemented):
f26ffce3079d1fcbbf969e453fa5d67834dfad34ba44f772...

Marker: Restart interval termination - Restart with modulo 8 count 0 (0xffd0)

Entropy-coded segment (dissection is not yet implemented):
f80f25b491c30cacd1149e3f5502cb1b381cda3a3aab1653...

Marker: Restart interval termination - Restart with modulo 8 count 1 (0xffd1)

Entropy-coded segment (dissection is not yet implemented):
f8c9e52fcbdd035fd06c751bcbcbce8af6e7d6f52189e354a...

Marker: Restart interval termination - Restart with modulo 8 count 2 (0xffd2)

Entropy-coded segment (dissection is not yet implemented):
f943f97089fe0fd25aaa246f5e8c53995ff48940a0041153...

Marker: Restart interval termination - Restart with modulo 8 count 3 (0xffd3)

Entropy-coded segment (dissection is not yet implemented):
f8c5e56f3dc1a5689a4e8e91c9ea41eaaceca10b132ccef5...

Marker: Restart interval termination - Restart with modulo 8 count 4 (0xffd4)

Entropy-coded segment (dissection is not yet implemented):
f85be5c82e62bdd1ee6c385e5fc93f2874fe2fcc709000d5...

Marker: Restart interval termination - Restart with modulo 8 count 5 (0xffd5)

Entropy-coded segment (dissection is not yet implemented):
f8cbf97d0da5b7e8fbc8bd9a3bfbab69934db4f4e88c826...

Marker: Restart interval termination - Restart with modulo 8 count 6 (0xffd6)

Entropy-coded segment (dissection is not yet implemented):
e2dff388ff00f3ec3d53f3ebf233c8bf9dda6ffce40a7912...

Marker: Restart interval termination - Restart with modulo 8 count 7 (0xffd7)

Entropy-coded segment (dissection is not yet implemented):
f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 0 (0xffd0)

Entropy-coded segment (dissection is not yet implemented):
f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 1 (0xffd1)

Entropy-coded segment (dissection is not yet implemented):
f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 2 (0xffd2)

Entropy-coded segment (dissection is not yet implemented):
f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...

Marker: Restart interval termination - Restart with modulo 8 count 3 (0xffd3)

Entropy-coded segment (dissection is not yet implemented):
f7effcf3ff00584ff233ff00066ffc49f56c55f7fe2aec...
Marker: Restart interval termination - Restart with modulo 8 count 4 (0xffd4)
Entropy-coded segment (dissection is not yet implemented):
f4effcfb875afcfd4ff009c31fc9bb7f257e5a7e5ff0098...
Marker: End of Image (0xffd9)