

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ НАВЧАЛЬНО-НАУКОВИЙ
КОМПЛЕКС «ІНСТИТУТ ПРИКЛАДНОГО СИСТЕМНОГО АНАЛІЗУ»
НАЦІОНАЛЬНОГО ТЕХНІЧНОГО УНІВЕРСИТЕТУ УКРАЇНИ
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ ІМЕНІ ІГОРЯ
СІКОРСЬКОГО» КАФЕДРА МАТЕМАТИЧНИХ МЕТОДІВ СИСТЕМНОГО
АНАЛІЗУ**

**Практична робота №2
з курсу «Комп'ютерні мережі»**

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Київ – 2020 р.

| No. | Time | Source | Destination | Protocol | Length | Info |
|---|----------|-------------------|-------------------|----------|--------|--|
| 53 | 0.000442 | 192.168.0.109 | gaia.cs.umass.edu | HTTP | 599 | GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1 |
| <p>Frame 53: 599 bytes on wire (4792 bits), 599 bytes captured (4792 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63}, id 0</p> <p>Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63})</p> <p>Encapsulation type: Ethernet (1)</p> <p>Arrival Time: Mar 30, 2020 23:22:53.830029000 Финляндия (лето)</p> <p>[Time shift for this packet: 0.000000000 seconds]</p> <p>Epoch Time: 1585599773.830029000 seconds</p> <p>[Time delta from previous captured frame: 0.000442000 seconds]</p> <p>[Time delta from previous displayed frame: 0.000000000 seconds]</p> <p>[Time since reference or first frame: 7.067332000 seconds]</p> <p>Frame Number: 53</p> <p>Frame Length: 599 bytes (4792 bits)</p> <p>Capture Length: 599 bytes (4792 bits)</p> <p>[Frame is marked: False]</p> <p>[Frame is ignored: False]</p> <p>[Protocols in frame: eth:ethertype:ip:tcp:http]</p> <p>[Coloring Rule Name: HTTP]</p> <p>[Coloring Rule String: http tcp.port == 80 http2]</p> | | | | | | |
| <p>Ethernet II, Src: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72), Dst: dir-300 (f0:7d:68:9d:27:c8)</p> <p>Destination: dir-300 (f0:7d:68:9d:27:c8)</p> <p>Source: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72)</p> <p>Type: IPv4 (0x0800)</p> | | | | | | |
| <p>Internet Protocol Version 4, Src: 192.168.0.109 (192.168.0.109), Dst: gaia.cs.umass.edu (128.119.245.12)</p> <p>0100 = Version: 4</p> <p>.... 0101 = Header Length: 20 bytes (5)</p> <p>Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)</p> <p>Total Length: 585</p> <p>Identification: 0xf164 (61796)</p> <p>Flags: 0x4000, Don't fragment</p> <p>Fragment offset: 0</p> <p>Time to live: 128</p> <p>Protocol: TCP (6)</p> <p>Header checksum: 0xd0b0 [validation disabled]</p> <p>[Header checksum status: Unverified]</p> <p>Source: 192.168.0.109 (192.168.0.109)</p> <p>Destination: gaia.cs.umass.edu (128.119.245.12)</p> | | | | | | |
| <p>Transmission Control Protocol, Src Port: immedianet-bcn (3657), Dst Port: http (80), Seq: 1, Ack: 1, Len: 533</p> | | | | | | |
| <p>Hypertext Transfer Protocol</p> <p>GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n</p> <p>Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n</p> <p>Accept-Language: en-US,en;q=0.8,ru-UA;q=0.6,ru;q=0.4,uk;q=0.2\r\n</p> <p>Upgrade-Insecure-Requests: 1\r\n</p> <p>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/18.18363\r\n</p> <p>Accept-Encoding: gzip, deflate\r\n</p> <p>Host: gaia.cs.umass.edu\r\n</p> <p>If-Modified-Since: Sun, 29 Mar 2020 05:59:04 GMT\r\n</p> <p>If-None-Match: "80-5a1f80826eccd"\r\n</p> <p>Connection: Keep-Alive\r\n</p> <p>\r\n</p> <p>[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]</p> <p>[HTTP request 1/1]</p> | | | | | | |
| <p>[Response in frame 55]</p> | | | | | | |
| 55 | 0.000001 | gaia.cs.umass.edu | 192.168.0.109 | HTTP | 552 | HTTP/1.1 200 OK (text/html) |
| <p>Frame 55: 552 bytes on wire (4416 bits), 552 bytes captured (4416 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63}, id 0</p> <p>Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63})</p> <p>Encapsulation type: Ethernet (1)</p> <p>Arrival Time: Mar 30, 2020 23:22:54.134346000 Финляндия (лето)</p> <p>[Time shift for this packet: 0.000000000 seconds]</p> <p>Epoch Time: 1585599774.134346000 seconds</p> <p>[Time delta from previous captured frame: 0.000010000 seconds]</p> <p>[Time delta from previous displayed frame: 0.304317000 seconds]</p> <p>[Time since reference or first frame: 7.371649000 seconds]</p> <p>Frame Number: 55</p> <p>Frame Length: 552 bytes (4416 bits)</p> <p>Capture Length: 552 bytes (4416 bits)</p> <p>[Frame is marked: False]</p> <p>[Frame is ignored: False]</p> <p>[Protocols in frame: eth:ethertype:ip:tcp:http:data-text-lines]</p> <p>[Coloring Rule Name: HTTP]</p> <p>[Coloring Rule String: http tcp.port == 80 http2]</p> | | | | | | |
| <p>Ethernet II, Src: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72)</p> <p>Destination: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72)</p> <p>Source: dir-300 (f0:7d:68:9d:27:c8)</p> <p>Type: IPv4 (0x0800)</p> | | | | | | |
| <p>Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.119.245.12), Dst: 192.168.0.109 (192.168.0.109)</p> <p>0100 = Version: 4</p> <p>.... 0101 = Header Length: 20 bytes (5)</p> <p>Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)</p> <p>Total Length: 538</p> <p>Identification: 0x54d2 (21714)</p> <p>Flags: 0x4000, Don't fragment</p> <p>Fragment offset: 0</p> <p>Time to live: 47</p> <p>Protocol: TCP (6)</p> <p>Header checksum: 0xbe72 [validation disabled]</p> <p>[Header checksum status: Unverified]</p> <p>Source: gaia.cs.umass.edu (128.119.245.12)</p> <p>Destination: 192.168.0.109 (192.168.0.109)</p> | | | | | | |
| <p>Transmission Control Protocol, Src Port: http (80), Dst Port: immedianet-bcn (3657), Seq: 1, Ack: 534, Len: 486</p> | | | | | | |
| <p>Hypertext Transfer Protocol</p> <p>HTTP/1.1 200 OK\r\n</p> <p>Date: Mon, 30 Mar 2020 20:22:48 GMT\r\n</p> <p>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</p> <p>Last-Modified: Mon, 30 Mar 2020 05:59:03 GMT\r\n</p> <p>ETag: "80-5a20c25eb0e37"\r\n</p> <p>Accept-Ranges: bytes\r\n</p> <p>Content-Length: 128\r\n</p> <p>Keep-Alive: timeout=5, max=100\r\n</p> <p>Connection: Keep-Alive\r\n</p> <p>Content-Type: text/html; charset=UTF-8\r\n</p> <p>\r\n</p> <p>[HTTP response 1/1]</p> <p>[Time since request: 0.304317000 seconds]</p> <p>[Request in frame: 53]</p> <p>[Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]</p> <p>File Data: 128 bytes</p> <p>Line-based text data: text/html (4 lines)</p> | | | | | | |

Контрольні запитання:

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

Браузер – 1.1, сервер – 1.1.

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

Accept-Language: en-US,en;q=0.8,ru-UA;q=0.6,ru;q=0.4,uk;q=0.2\r\n

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

Src: 192.168.0.109

Dst: 128.119.245.12

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

HTTP/1.1 200 OK

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

Last-Modified: Mon, 30 Mar 2020 05:59:03 GMT\r\n

6. Скільки байт контенту повертається сервером?

Content-Length: 128\r\n

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.

Ні, такі заголовки відсутні.

```
[Encapsulated in frame 65]
No.    Time           Source            Destination      Protocol Length Info
65 0.000002      gaia.cs.umass.edu 192.168.0.109    HTTP           305    HTTP/1.1 304 Not Modified
Frame 65: 305 bytes on wire (2440 bits), 305 bytes captured (2440 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FCDC5A63}, id 0
Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FCDC5A63})
Encapsulation type: Ethernet (1)
Arrival Time: Mar 30, 2020 23:43:26.236310000 Финляндия (лето)
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 1585601006.236310000 seconds
[Time delta from previous captured frame: 0.000002000 seconds]
[Time delta from previous displayed frame: 0.306896000 seconds]
[Time since reference or first frame: 47.412564000 seconds]
Frame Number: 65
Frame Length: 305 bytes (2440 bits)
Capture Length: 305 bytes (2440 bits)
[Frame is marked: False]
[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: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72)
Destination: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72)
Source: dir-300 (f0:7d:68:9d:27:c8)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.119.245.12), Dst: 192.168.0.109 (192.168.0.109)
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 291
Identification: 0x878d (34701)
Flags: 0x4000, Don't fragment
Fragment offset: 0
Time to live: 47
Protocol: TCP (6)
Header checksum: 0x8cae [validation disabled]
[Header checksum status: Unverified]
Source: gaia.cs.umass.edu (128.119.245.12)
Destination: 192.168.0.109 (192.168.0.109)

Transmission Control Protocol, Src Port: http (80), Dst Port: canon-capt (3756), Seq: 1, Ack: 560, Len: 239
Hypertext Transfer Protocol
HTTP/1.1 304 Not Modified\r\n
Date: Mon, 30 Mar 2020 20:43:20 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
Connection: Keep-Alive\r\n
Keep-Alive: timeout=5, max=100\r\n
ETag: "80-5a20c25eb0e37"\r\n
\r\n
[HTTP response 1/1]
[Time since request: 0.306896000 seconds]
[Request in frame: 63]
[Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]

[HTTP request 1/1]
[Response in frame: 65]
```

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

If-Modified-Since: Mon, 30 Mar 2020 05:59:03 GMT\r\n

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

Так, повернув.

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

If-Modified-Since: Mon, 30 Mar 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/1.1 200 OK\r\n

Так, повернув

```
No.    Time           Source            Destination      Protocol Length Info
21 0.000329      192.168.0.109    ip171.new.lh.net  HTTP           563    GET /dyn/str_strip/
00000000/00000000/00000000/000000/70000/7000/300/77356/77356.strip.sunday.gif HTTP/1.1
Frame 21: 563 bytes on wire (4504 bits), 563 bytes captured (4504 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDC5A63}, id 0
Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDC5A63})
Encapsulation type: Ethernet (1)
Arrival Time: Mar 31, 2020 00:02:36.011221000 Фінляндия (лето)
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 1585602156.011221000 seconds
[Time delta from previous captured frame: 0.000329000 seconds]
[Time delta from previous displayed frame: 0.000000000 seconds]
[Time since reference or first frame: 1.542481000 seconds]
Frame Number: 21
Frame Length: 563 bytes (4504 bits)
Capture Length: 563 bytes (4504 bits)
[Frame is marked: False]
[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_bd:6b:72 (b8:08:cf:bd:6b:72), Dst: dir-300 (f0:7d:68:9d:27:c8)
Destination: dir-300 (f0:7d:68:9d:27:c8)
Source: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72)
Type: IPv4 (0x0800)
Internet Protocol Version 4, Src: 192.168.0.109 (192.168.0.109), Dst: ip171.new.lh.net (66.6.101.171)
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
Total Length: 549
Identification: 0x1ee3 (7907)
Flags: 0x4000, Don't fragment
Fragment offset: 0
Time to live: 128
Protocol: TCP (6)
Header checksum: 0x7129 [validation disabled]
[Header checksum status: Unverified]
Source: 192.168.0.109 (192.168.0.109)
Destination: ip171.new.lh.net (66.6.101.171)
Transmission Control Protocol, Src Port: idps (3797), Dst Port: http (80), Seq: 1, Ack: 1, Len: 497
Source Port: idps (3797)
Destination Port: http (80)
[Stream index: 2]
[TCP Segment Len: 497]
Sequence number: 1 (relative sequence number)
Sequence number (raw): 3394367579
[Next sequence number: 498 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)
Acknowledgment number (raw): 4013656572
1000 .... = Header Length: 32 bytes (8)
Flags: 0x01B (PSH, ACK)
Window size value: 65535
[Calculated window size: 65535]
[Window size scaling factor: -2 (no window scaling used)]
Checksum: 0x23fc [unverified]
[Checksum Status: Unverified]
Urgent pointer: 0
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
[SEQ/ACK analysis]
```

| No. | Time | Source | Destination | Protocol | Length | Info |
|--|----------|------------------|---------------|----------|--------|--------------------------------|
| 25 | 0.000002 | ip171.new.lh.net | 192.168.0.109 | HTTP | 286 | HTTP/1.1 301 Moved Permanently |
| Frame 25: 286 bytes on wire (2288 bits), 286 bytes captured (2288 bits) on interface \Device\NPF_{8B0166E5-FD86-4451-8613-1738FDC5A63}, id 0 Interface id: 0 (\Device\NPF_{8B0166E5-FD86-4451-8613-1738FDC5A63}) Encapsulation type: Ethernet (1) Arrival Time: Mar 31, 2020 00:02:36.212298000 Финляндия (лето) [Time shift for this packet: 0.000000000 seconds] Epoch Time: 1585602156.212298000 seconds [Time delta from previous captured frame: 0.000002000 seconds] [Time delta from previous displayed frame: 0.201877000 seconds] [Time since reference or first frame: 1.743558000 seconds] Frame Number: 25 Frame Length: 286 bytes (2288 bits) Capture Length: 286 bytes (2288 bits) [Frame is marked: False] [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: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72) Destination: IntelCor_bd:6b:72 (b8:08:cf:bd:6b:72) Source: dir-300 (f0:7d:68:9d:27:c8) Type: IPv4 (0x0800) Internet Protocol Version 4, Src: ip171.new.lh.net (66.6.101.171), Dst: 192.168.0.109 (192.168.0.109) 0100 = Version: 4 0101 = Header Length: 20 bytes (5) Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT) Total Length: 272 Identification: 0x3031 (12337) Flags: 0x4000, Don't fragment Fragment offset: 0 Time to live: 52 Protocol: TCP (6) Header checksum: 0xacf0 [validation disabled] [Header checksum status: Unverified] Source: ip171.new.lh.net (66.6.101.171) Destination: 192.168.0.109 (192.168.0.109) Transmission Control Protocol, Src Port: http (80), Dst Port: idps (3797), Seq: 1, Ack: 498, Len: 220 Source Port: http (80) Destination Port: idps (3797) [Stream index: 2] [TCP Segment Len: 220] Sequence number: 1 (relative sequence number) Sequence number (raw): 4013656572 [Next sequence number: 221 (relative sequence number)] Acknowledgment number: 498 (relative ack number) Acknowledgment number (raw): 3394368076 1000 = Header Length: 32 bytes (8) Flags: 0x018 (PSH, ACK) Window size value: 30016 [Calculated window size: 30016] [Window size scaling factor: -2 (no window scaling used)] Checksum: 0x59ca [unverified] [Checksum Status: Unverified] Urgent pointer: 0 Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps [SEQ/ACK analysis] | | | | | | |

12. Скільки повідомлень HTTP GET було відправлено вашим браузером?

Одне повідомлення.

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

220

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

HTTP/1.1 301 Moved Permanently

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

Не зустрічаються

lans-lab2-http_newer.pdf 2 lab.pdf 2(1) lab.pdf 2(3) lab.pdf

file:///D:/Пользователь/Рабочий%20стол/ИПСА/3%20курс/2семестр/КС/2(3)%20lab.pdf

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По размеру страницы Разметка страницы А⁰ Прочсть вслх Добавление примечаний

No. Time Source Destination Protocol Length Info

28 0.00050 192.168.0.109 gaia.cs.umass.edu HTTP 514 GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1

Frame 28: 514 bytes on wire (4112 bits), 514 bytes captured (4112 bits) on interface 'Device\\NPF_{880166E5-FD86-4451-8613-1738FCDC5A63}', Id 0

Ethernet II, Src: IntelCor_bd:bb:72 (b8:08:cf:bd:bb:72), Dst: dir-300 (f0:7d:68:9d:27:c8)

Internet Protocol Version 4, Src: 192.168.0.109 (192.168.0.109), Dst: gaia.cs.umass.edu (128.119.245.12)

Transmission Control Protocol, Src Port: xpl (3865), Dst Port: http (80), Seq: 1, Ack: 1, Len: 448

Source Port: xpl (3865)

Destination Port: http (80)

[Stream index: 2]

[TCP Segment Len: 448]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 3804380694

[Next sequence number: 449 (relative sequence number)]

Acknowledgment number: 1 (relative ack number)

Acknowledgment number (raw): 3364253788

1000 = Header Length: 32 bytes (8)

Flags: 0x018 (PSH, ACK)

Window size value: 1024

[Calculated window size: 262144]

Window size scaling factor: 256

Checksum: 8b8d6 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps [Seq/ACK analysis]

[Timestamps]

TCP payload (448 bytes)

Hypertext Transfer Protocol

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

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

Accept-Language: en-US,en;q=0.8,ru-uk;q=0.6,ru;q=0.4,uk;q=0.2\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/18.18613\r\n

Accept-Encoding: gzip, deflate\r\n

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

Connection: keep-alive\r\n

\r\n

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

HTTP request 1/2]

[Response in frame: 49]

[Next request in frame: 51]

No. Time Source Destination Protocol Length Info

49 0.000812 gaia.cs.umass.edu 192.168.0.109 HTTP 1139 HTTP/1.1 200 OK (text/html)

Frame 49: 1139 bytes on wire (9112 bits), 1139 bytes captured (9112 bits) on interface 'Device\\NPF_{880166E5-FD86-4451-8613-1738FCDC5A63}', Id 0

Ethernet II, Src: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd:bb:72 (b8:08:cf:bd:bb:72)

Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.119.245.12), Dst: 192.168.0.109 (192.168.0.109)

Transmission Control Protocol, Src Port: http (80), Dst Port: xpl (3865), Seq: 1, Ack: 449, Len: 1073

Source Port: http (80)

Destination Port: xpl (3865)

[Stream index: 2]

[TCP Segment Len: 1073]

Sequence number: 1 (relative sequence number)

Sequence number (raw): 3364253788

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

Acknowledgment number: 449 (relative ack number)

Acknowledgment number (raw): 3804380142

1000 = Header Length: 32 bytes (8)

Flags: 0x018 (PSH, ACK)

Window size value: 1024

[Calculated window size: 262144]

Window size scaling factor: 256

Checksum: 8bf86 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps [Seq/ACK analysis]

[Timestamps]

TCP payload (1073 bytes)

Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

Date: Mon, 30 Mar 2020 21:31:05 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: Mon, 30 Mar 2020 05:59:03 GMT\r\n

ETag: "2ca-5a2b23eaf6"\r\n

Accept-Ranges: bytes\r\n

Content-Length: 714\r\n

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

Connection: Keep-Alive\r\n

Content-Type: text/html; charset=UTF-8\r\n

\r\n

[HTTP response 1/2]

[Time since request: 0.221809000 seconds]

[Request in frame: 28]

[Next request in frame: 51]

[Next response in frame: 51]

[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)

51 0.042645 192.168.0.109 gaia.cs.umass.edu HTTP 515 GET /pearson.png HTTP/1.1

Frame 51: 515 bytes on wire (4120 bits), 515 bytes captured (4120 bits) on interface 'Device\\NPF_{880166E5-FD86-4451-8613-1738FCDC5A63}', Id 0

Ethernet II, Src: IntelCor_bd:bb:72 (b8:08:cf:bd:bb:72), Dst: dir-300 (f0:7d:68:9d:27:c8)

Internet Protocol Version 4, Src: 192.168.0.109 (192.168.0.109), Dst: gaia.cs.umass.edu (128.119.245.12)

Transmission Control Protocol, Src Port: xpl (3865), Dst Port: http (80), Seq: 449, Ack: 1074, Len: 449

Source Port: xpl (3865)

Destination Port: http (80)

[Stream index: 2]

[TCP Segment Len: 449]

Sequence number: 449 (relative sequence number)

Sequence number (raw): 3804380142

[Next sequence number: 898 (relative sequence number)]

Acknowledgment number: 1074 (relative ack number)

Acknowledgment number (raw): 3364254061

1000 = Header Length: 32 bytes (8)

Flags: 0x018 (PSH, ACK)

Window size value: 1019

[Calculated window size: 260864]

Window size scaling factor: 256

Checksum: 8fec9 [unverified]

[Checksum Status: Unverified]

Urgent pointer: 0

Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps [Seq/ACK analysis]

[Timestamps]

TCP payload (449 bytes)

lans-lab2-http_newer.pdf 2 lab.pdf 2(1) lab.pdf 2(3) lab.pdf

file:///D:/Пользователь/Рабочий%20стол/ИПСА/3%20курс/2семестр/КС/2(3)%20lab.pdf

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По размеру страницы Разметка страницы Прочть вслх Добавление примечаний

```
TCP payload (489 bytes)
Hypertext Transfer Protocol
GET /pearson.png HTTP/1.1\r\n
Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n
Accept: image/png,image/svg+xml,image/*;q=0.8,*/*;q=0.5\r\n
Accept-Language: en-US,en;q=0.8,ru-uk;q=0.6,ru;q=0.4,uk;q=0.2\r\n
Accept-Encoding: gzip, deflate\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/18.18363\r\n
Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/pearson.png]
[HTTP request 2/2]
[Prev request in frame: 28]
[Response in frame: 91]

No.    Time                Source                Destination            Protocol Length Info
-----
91 0.0000000    gaia.cs.umass.edu    192.168.0.109          HTTP                781      HTTP/1.1 200 OK (PNG)
Frame 91: 781 bytes on wire (6248 bits), 781 bytes captured (6248 bits) on interface \\Device\\NPF_{B8B166E5-FDB6-4451-8613-173BFCD5A633}, id 0
Ethernet II, Src: IntelCor_bd:6b:72 (88:08:c8:bd:6b:72), Dst: IntelCor_bd:6b:72 (88:08:c8:bd:6b:72)
Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.119.245.12), Dst: 192.168.0.109 (192.168.0.109)
Transmission Control Protocol, Src Port: http (80), Dst Port: npl (3865), Seq: 3070, Ack: 886, Len: 715
Source Port: http (80)
Destination Port: npl (3865)
[Stream index: 2]
[TCP Segment Len: 715]
Sequence number: 3070 (relative sequence number)
Sequence number (raw): 3364257757
[Next sequence number: 4685 (relative sequence number)]
Acknowledgment number: 898 (relative ack number)
Acknowledgment number (raw): 3804389591
1800 ... -> Header Length: 32 bytes (8)
Flags: 0x018 (PSH, ACK)
Window size value: 240
[Calculated window size: 31304]
[Window size scaling factor: 128]
Checksum: 0x408 [unverified]
[Checksum Status: Unverified]
Urgent pointer: 0
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
[SEQ/ACK analysis]
[Timestamps]
TCP payload (715 bytes)
TCP segment data (715 bytes)
[3 Reassembled TCP Segments (3611 bytes): #88(1448), #90(1448), #91(715)]
Hypertext Transfer Protocol
HTTP/1.1 200 OK\r\n
Date: Mon, 10 Mar 2020 21:31:05 GMT\r\n
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/5.4.16 mod_perl/2.0.11 Perl/5.16.3\r\n
Last-Modified: Sat, 08 Aug 2016 10:08:14 GMT\r\n
ETag: "c3-539645cf7ae7"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 3267\r\n
Keep-Alive: timeout=5, max=99\r\n
Connection: Keep-Alive\r\n
Content-Type: image/png\r\n
\r\n
[HTTP response 2/2]
[Time since request: 0.224889800 seconds]
[Prev request in frame: 28]
[Prev response in frame: 48]
```

lans-lab2-http_newer.pdf 2 lab.pdf 2(1) lab.pdf 2(3) lab.pdf

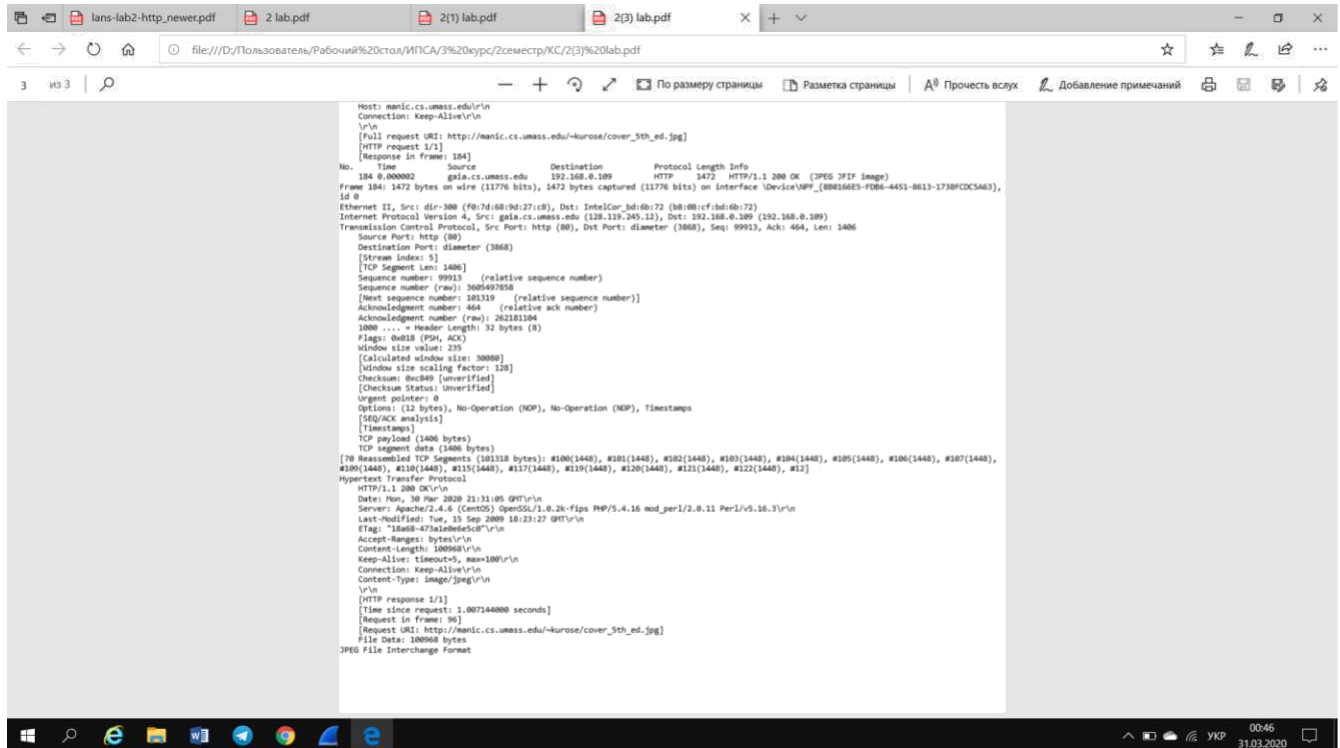
file:///D:/Пользователь/Рабочий%20стол/ИПСА/3%20курс/2семестр/КС/2(3)%20lab.pdf

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По размеру страницы Разметка страницы Прочть вслх Добавление примечаний

```
[Prev response in frame: 48]
[Request in frame: 51]
[Request URI: http://gaia.cs.umass.edu/pearson.png]
File Data: 3267 bytes
Portable Network Graphics
No.    Time                Source                Destination            Protocol Length Info
-----
96 0.000409    192.168.0.109        gaia.cs.umass.edu      HTTP                529      GET /kurose/cover_5th_ed.jpg HTTP/1.1
Frame 96: 529 bytes on wire (4232 bits), 529 bytes captured (4232 bits) on interface \\Device\\NPF_{B8B166E5-FDB6-4451-8613-173BFCD5A633}, id 0
Ethernet II, Src: IntelCor_bd:6b:72 (88:08:c8:bd:6b:72), Dst: dir-300 (f0:7d:68:9d:27:c8)
Internet Protocol Version 4, Src: 192.168.0.109 (192.168.0.109), Dst: gaia.cs.umass.edu (128.119.245.12)
Transmission Control Protocol, Src Port: diameter (3868), Dst Port: http (80), Seq: 1, Ack: 1, Len: 463
Source Port: diameter (3868)
Destination Port: http (80)
[Stream index: 5]
[TCP Segment Len: 463]
Sequence number: 1 (relative sequence number)
Sequence number (raw): 262180641
[Next sequence number: 464 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)
Acknowledgment number (raw): 3685397946
1800 ... -> Header Length: 32 bytes (8)
Flags: 0x018 (PSH, ACK)
Window size value: 3824
[Calculated window size: 262144]
[Window size scaling factor: 256]
Checksum: 0x1c7 [unverified]
[Checksum Status: Unverified]
Urgent pointer: 0
Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
[SEQ/ACK analysis]
[Timestamps]
TCP payload (463 bytes)
Hypertext Transfer Protocol
GET /kurose/cover_5th_ed.jpg HTTP/1.1\r\n
Referer: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n
Accept: image/png,image/svg+xml,image/*;q=0.8,*/*;q=0.5\r\n
Accept-Language: en-US,en;q=0.8,ru-uk;q=0.6,ru;q=0.4,uk;q=0.2\r\n
Accept-Encoding: gzip, deflate\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/18.18363\r\n
Host: manic.cs.umass.edu\r\n
Connection: keep-alive\r\n
\r\n
[Full request URI: http://manic.cs.umass.edu/~kurose/cover_5th_ed.jpg]
[HTTP request 1/1]
[Response in frame: 184]

No.    Time                Source                Destination            Protocol Length Info
-----
184 0.000002    gaia.cs.umass.edu    192.168.0.109          HTTP                3472     HTTP/1.1 200 OK (JPEG 3FIF image)
Frame 184: 1472 bytes on wire (11776 bits), 1472 bytes captured (11776 bits) on interface \\Device\\NPF_{B8B166E5-FDB6-4451-8613-173BFCD5A633}, id 0
Ethernet II, Src: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd:6b:72 (88:08:c8:bd:6b:72)
Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.119.245.12), Dst: 192.168.0.109 (192.168.0.109)
Transmission Control Protocol, Src Port: http (80), Dst Port: diameter (3868), Seq: 99913, Ack: 464, Len: 1406
Source Port: http (80)
Destination Port: diameter (3868)
[Stream index: 5]
[TCP Segment Len: 1406]
Sequence number: 99913 (relative sequence number)
```



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

3 запити:

| No. | Time | Source | Destination | Protocol | Length | Info |
|-----|----------|---------------|-------------------|----------|--------|--|
| 28 | 0.000650 | 192.168.0.109 | gaia.cs.umass.edu | HTTP | 514 | GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1 |
| 51 | 0.042645 | 192.168.0.109 | gaia.cs.umass.edu | HTTP | 515 | GET /pearson.png HTTP/1.1 |
| 96 | 0.000409 | 192.168.0.109 | gaia.cs.umass.edu | HTTP | 529 | GET /~kurose/cover_5th_ed.jpg HTTP/1.1 |

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

Вони були отримані послідовно, можна побачити за часом

Висновки:

В цій лабораторній роботі більш детально була проведена робота з протоколом HTTP та досліджені деякі HTTP заголовки і їх значення, а саме Accept-Language, Last-Modified, Content-Length, If-Modified-Since та інші. Було виявлено взаємодії між появою деяких заголовків і умовах захоплення пакетів і те яким чином чином отримуються ресурси з сайту. Також виявилось, що для великих за розміром ресурсів може знадобитись велика кількість TCP пакетів для доставки відповіді сервера, і що в цих пакетах містяться стрічки з кодом та описом статусу відповіді та заголовки HTTP.