

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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групи КА-73
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```
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
Frame 53: 599 bytes on wire (4792 bits), 599 bytes captured (4792 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63}, id 0
  Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63})
  Encapsulation type: Ethernet (1)
  Arrival Time: Mar 30, 2020 23:22:53.830029000 Финляндия (лето)
  [Time shift for this packet: 0.000000000 seconds]
  Epoch Time: 1585599773.830029000 seconds
  [Time delta from previous captured frame: 0.000442000 seconds]
  [Time delta from previous displayed frame: 0.000000000 seconds]
  [Time since reference or first frame: 7.067332000 seconds]
  Frame Number: 53
  Frame Length: 599 bytes (4792 bits)
  Capture Length: 599 bytes (4792 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: gaia.cs.umass.edu (128.119.245.12)
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
  Total Length: 585
  Identification: 0xf164 (61796)
  Flags: 0x4000, Don't fragment
  Fragment offset: 0
  Time to live: 128
  Protocol: TCP (6)
  Header checksum: 0xd0b0 [validation disabled]
  [Header checksum status: Unverified]
  Source: 192.168.0.109 (192.168.0.109)
  Destination: gaia.cs.umass.edu (128.119.245.12)
Transmission Control Protocol, Src Port: immedianet-bcn (3657), Dst Port: http (80), Seq: 1, Ack: 1, Len: 533
Hypertext Transfer Protocol
  GET /wireshark-labs/HTTP-wireshark-file1.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-UA;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/
18.18363\r\n
  Accept-Encoding: gzip, deflate\r\n
  Host: gaia.cs.umass.edu\r\n
  If-Modified-Since: Sun, 29 Mar 2020 05:59:04 GMT\r\n
  If-None-Match: "80-5a1f80826eccd"\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]
```

```
No.      Time      Source      Destination      Protocol Length Info
55 0.000001 192.168.0.109 192.168.0.109 HTTP 552 HTTP/1.1 200 OK (text/html)
Frame 55: 552 bytes on wire (4416 bits), 552 bytes captured (4416 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63}, id 0
  Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FDCD5A63})
  Encapsulation type: Ethernet (1)
  Arrival Time: Mar 30, 2020 23:22:54.134346000 Финляндия (лето)
  [Time shift for this packet: 0.000000000 seconds]
  Epoch Time: 1585599774.134346000 seconds
  [Time delta from previous captured frame: 0.000010000 seconds]
  [Time delta from previous displayed frame: 0.304317000 seconds]
  [Time since reference or first frame: 7.371649000 seconds]
  Frame Number: 55
  Frame Length: 552 bytes (4416 bits)
  Capture Length: 552 bytes (4416 bits)
  [Frame is marked: False]
  [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: 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: 538
  Identification: 0x54d2 (21714)
  Flags: 0x4000, Don't fragment
  Fragment offset: 0
  Time to live: 47
  Protocol: TCP (6)
  Header checksum: 0xbe72 [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: immedianet-bcn (3657), Seq: 1, Ack: 534, Len: 486
```

```
Hypertext Transfer Protocol
  HTTP/1.1 200 OK\r\n
  Date: Mon, 30 Mar 2020 20:22:48 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: "80-5a20c25eb0e37"\r\n
  Accept-Ranges: bytes\r\n
  Content-Length: 128\r\n
  Keep-Alive: timeout=5, max=100\r\n
  Connection: Keep-Alive\r\n
  Content-Type: text/html; charset=UTF-8\r\n
  \r\n
  [HTTP response 1/1]
  [Time since request: 0.304317000 seconds]
  [Request in frame: 53]
  [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)
```

Контрольні запитання:

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

Браузер – 1.1, сервер – 1.1.

3. 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.

```
[response 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/
00000000/00000000/00000000/000000/7000/300/77356/77356.strip.sunday.gif HTTP/1.1
Frame 21: 563 bytes on wire (4504 bits), 563 bytes captured (4504 bits) on interface \Device\NPF_{8B0166E5-FDB6-4451-8613-1738FCDC5A63}, id 0
Interface id: 0 (\Device\NPF_{8B0166E5-FDB6-4451-8613-1738FCDC5A63})
Encapsulation type: Ethernet (1)
Arrival Time: Mar 31, 2020 00:02:36.01221000 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: 0x018 (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-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 00:02:36.212298000 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

1 из 3

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 'DeviceNPF_{880166E5-FD86-4451-8613-1738FCDC5A63}', Id 0
Ethernet II, Src: IntelCor_bd:6b:72 (b8:08:cf: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: 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): 380438094
[Next sequence number: 449 (relative sequence number)]
Acknowledgment number: 1 (relative ack number)
Acknowledgment number (raw): 3364253780
1000 .... = Header Length: 32 bytes (8)
Flags: 0x018 (PSH, ACK)
Window size value: 1024
[Calculated window size: 262144]
[Window size scaling factor: 256]
Checksum: 0x018 [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=0.4,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/
18.18363\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 0.000612 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 'DeviceNPF_{880166E5-FD86-4451-8613-1738FCDC5A63}', Id 0
Ethernet II, Src: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd:6b:72 (b8:08:cf: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: 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): 3364253780
[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: 0xf046 [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 09:59:03 GMT\r\n
ETag: "3ca-5a2b23a5aaf"\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)
No. Time Source Destination Protocol Length Info
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 'DeviceNPF_{880166E5-FD86-4451-8613-1738FCDC5A63}', Id 0
Ethernet II, Src: IntelCor_bd:6b:72 (b8:08:cf: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: 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: 898 (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: 0xfec9 [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)
```

00:43 31.03.2020

00:44 31.03.2020

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/KC/2(3)%20lab.pdf

2 из 3

По размеру страницы Разметка страницы А⁰ Прочсть вслх Добавление примечаний

```
TCP payload (449 bytes)
Hypertext Transfer Protocol
GET /person.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=0.4,ru;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/
18.10363\r\n
Host: gaia.cs.umass.edu\r\n
Connection: keep-alive\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/person.png]
[HTTP request 2/2]
[Prev request in frame: 28]
[Response in frame: 91]

No.    Time    Source                Destination            Protocol Length Info
-----
Frame 91: 781 bytes on wire (6248 bits), 781 bytes captured (6248 bits) on Interface Device\NPF_{BB0166E5-FDB6-4451-8613-173BFCC5A63}, id 0
Ethernet II, Src: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd0b:72 (b8:08:cf:bd:0b:72)
Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.110.245.12), Dst: 192.168.0.109 (192.168.0.109)
Transmission Control Protocol, Src Port: http (80), Dst Port: spl (3865), Seq: 3970, Ack: 899, Len: 715
Source Port: http (80)
Destination Port: spl (3865)
[Stream index: 2]
[TCP Segment Len: 715]
Sequence number: 3970 (relative sequence number)
Sequence number (raw): 3364257757
[Next sequence number: 4685 (relative sequence number)]
Acknowledgment number: 899 (relative ack number)
Acknowledgment number (raw): 3804389591
3808 ... -> Header Length: 32 bytes (8)
Flags: 0x018 (PSH, ACK)
Window size value: 243
[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, 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/5.16.3\r\n
Last-Modified: Sat, 08 Aug 2016 10:08:14 GMT\r\n
ETag: "c3-539645cf7faw"\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: 0.224889000 seconds]
[Prev request in frame: 28]
[Prev response in frame: 49]

[Request in frame: 51]
[Request URI: http://gaia.cs.umass.edu/person.png]
File Data: 3267 bytes
Portable Network Graphics
No.    Time    Source                Destination            Protocol Length Info
-----
Frame 96: 529 bytes on wire (4232 bits), 529 bytes captured (4232 bits) on Interface Device\NPF_{BB0166E5-FDB6-4451-8613-173BFCC5A63}, id 0
Ethernet II, Src: IntelCor_bd0b:72 (b8:08:cf:bd:0b: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 (128.110.245.12)
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): 3605397946
3808 ... -> Header Length: 32 bytes (8)
Flags: 0x018 (PSH, ACK)
Window size value: 1024
[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=0.4,ru;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/
18.10363\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
-----
Frame 184: 1472 bytes on wire (11776 bits), 1472 bytes captured (11776 bits) on Interface Device\NPF_{BB0166E5-FDB6-4451-8613-173BFCC5A63}, id 0
Ethernet II, Src: dir-300 (f0:7d:68:9d:27:c8), Dst: IntelCor_bd0b:72 (b8:08:cf:bd:0b:72)
Internet Protocol Version 4, Src: gaia.cs.umass.edu (128.110.245.12), 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)
```

00:45 31.03.2020

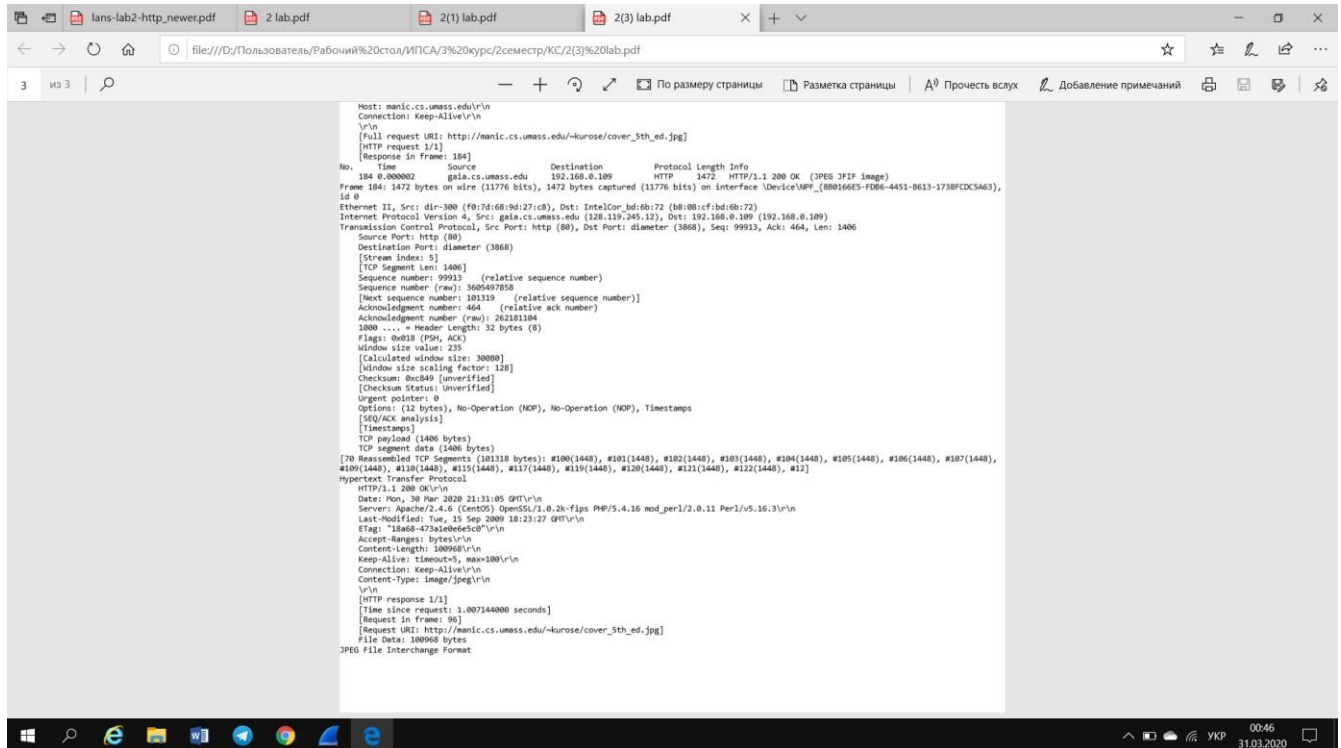
lans-lab2-http_newer.pdf 2 lab.pdf 2(1) lab.pdf 2(3) lab.pdf

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

3 из 3

По размеру страницы Разметка страницы А⁰ Прочсть вслх Добавление примечаний

00:46 31.03.2020



16. Скільки запитів HTTP GET було відправлено вашим браузером? Якими

були цільові IP-адреси запитів? З 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
No.	Time	Source	Destination	Protocol	Length	Info
51	0.042645	192.168.0.109	gaia.cs.umass.edu	HTTP	515	GET /pearson.png HTTP/1.1
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

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, IfModified-Since та інші. Було виявлено взаємодії між появою деяких заголовків і умовах захоплення пакетів і те яким 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.