Міністерство освіти і науки України Національний технічний університет України

«Київський політехнічний інститут ім. І.І.Сікорського»

Навчально-науковий комплекс

«Інститут прикладного системного аналізу»

Лабораторна робота №2

з дисципліни: “Комп’ютерні мережі ”

**Виконала:** студентка IⅡ курсу групи КА-74

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**Прийняв:** Кухарєв С.О

## Пакети для відповідей 1-7 та 8-11:

No. Time Source Destination Protocol Length Info

739 8.917047 192.168.0.102 128.119.245.12 HTTP 453 GET /wireshark-

labs/HTTP-wireshark-file1.html HTTP/1.1

Frame 739: 453 bytes on wire (3624 bits), 435 bytes captured (3624 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99), Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102 (192.168.0.102), Dst: 128.119.245.12 (128.119.245.12)

Transmission Control Protocol, Src Port: 5520 (5520), Dst Port: http (80), Seq: 1, Ack: 1, Len: 399 Hypertext Transfer Protocol

GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n Host: gaia.cs.umass.edu\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) Gecko/20100101 Firefox/45.0\r\n Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8\r\n

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3 Accept-Encoding: gzip, deflate\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: 748]

-

No. Time Source Destination Protocol Length Info

748 9.038187 128.119.245.12 192.168.1.245 HTTP 540 HTTP/1.1 200 OK

(text/html)

Frame 748: 540 bytes on wire (4320 bits), 540 bytes captured (4320 bits) on interface 0

Ethernet II, Src: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa), Dst: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99) Internet Protocol Version 4, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.0.102 (192.168.0.102)

Transmission Control Protocol, Src Port: http (80), Dst Port: 5520 (5520), Seq: 1, Ack: 400, Len: 486 Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

Date: Sun, 08 Mar 2020 21:17:11 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.1e-fips PHP/5.4.16 mod\_perl/2.0.9dev Perl/v5.16.3\r\n

Last-Modified: Sun, 08 Mar 2020 06:59:03 GMT\r\n ETag: "80-5a0526c077876"\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: 0.121140000 seconds] [Request in frame: 739]

Line-based text data: text/html

<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

754 9.107576 192.168.0.102 128.119.245.12 HTTP 334 GET /wireshark-

labs/HTTP-wireshark-file1.html HTTP/1.1

Frame 754: 334 bytes on wire (2672 bits), 334 bytes captured (2672 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99) , Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102 (192.168.0.102), Dst: 128.119.245.12 (128.119.245.12)

Transmission Control Protocol, Src Port: 5521 (5521), Dst Port: http (80), Seq: 1, Ack: 1, Len: 280 Hypertext Transfer Protocol

GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n Host: gaia.cs.umass.edu\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64)) Gecko/20100101 Firefox/45.0\r\n Accept: text/html,application/xhtml+xml,application/xml;q=0.9,\*/\*;q=0.8\r\n

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3 Accept-Encoding: gzip, deflate\r\n

Connection: keep-alive\r\n

Last-Modified: Sun, 08 Mar 2020 06:59:03 GMT\r\n ETag: "80-5a0526c077876"\r\n

Cache-Control: max-age=0\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: 762]

No. Time Source Destination Protocol Length Info

762 9.224545 128.119.245.12 192.168.0.102 HTTP 539 HTTP/1.1 304

Not Modified

Frame 762: 539 bytes on wire (4312 bits), 539 bytes captured (4312 bits) on interface 0

Ethernet II, Src: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa), Dst: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99) Internet Protocol Version 4, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.0.102 (192.168.0.102)

Transmission Control Protocol, Src Port: http (80), Dst Port: 5521 (5521), Seq: 1, Ack: 281, Len: 485 Hypertext Transfer Protocol

HTTP/1.1 304 Not Modified\r\n

Date: Sun, 08 Mar 2020 21:17:11 GMT\r\n

Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.1e-fips PHP/5.4.16 mod\_perl/2.0.9dev Perl/v5.16.3\r\n Connection: Keep-Alive\r\n

Keep-Alive: timeout=5, max=100\r\n ETag: "80-5a0526c077876"\r\n

\r\n

[HTTP response 1/1]

[Time since request: 0.116969000 seconds] [Request in frame: 754]

## Пакети для відповідей 12-15:

No. Time Source Destination Protocol Length Info

535 17.445530 192.168.0.102 178.18.231.115 HTTP 373 GET /success.txt HTTP/1.1

Frame 535: 373 bytes on wire (2984 bits), 373 bytes captured (2984 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99), Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102 (192.168.0.102), Dst: 178.18.231.115 (178.18.231.115)

Transmission Control Protocol, Src Port: 1141 (1141), Dst Port: http (80), Seq: 1, Ack: 1, Len: 319 Hypertext Transfer Protocol

GET /success.txt HTTP/1.1\r\n

[Expert Info (Chat/Sequence): GET /success.txt HTTP/1.1\r\n] [Message: GET /success.txt HTTP/1.1\r\n]

[Severity level: Chat] [Group: Sequence]

Request Method: GET Request URI: /success.txt Request Version: HTTP/1.1

Host: detectportal.firefox.com\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:73.0) Gecko/20100101 Firefox/73.0\r\n Accept: \*/\*\r\n

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3 Accept-Encoding: gzip, deflate\r\n

Connection: keep-alive\r\n

\r\n

[Full request URI: <http://www.detectportal.firefox.com/success.txt>] [HTTP request 1/1]

[Response in frame: 658]

-

No. Time Source Destination Protocol Length Info

658 17.678662 178.18.231.83 192.168.0.102 HTTP 438 HTTP/1.1 200 OK

(text/plain)

Frame 658: 438 bytes on wire (3504 bits), 438 bytes captured (3504 bits) on interface 0

Ethernet II, Src: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa), Dst: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99) Internet Protocol Version 4, Src: 178.18.231.83, Dst: 192.168.0.102

Transmission Control Protocol, Src Port: 80, Dst Port: 2286, Seq: 1, Ack: 320, Len: 384 Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

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

[Severity level: Chat] [Group: Sequence]

Request Version: HTTP/1.1 Status Code: 200

Response Phrase: OK

Last-Modified: Mon, 15 May 2017 18:04:40 GMT\r\n ETag: "ae780585f49b94ce1444eb7d28906123"\r\n Accept-Ranges: bytes\r\n

Server: AmazonS3\r\n

Cache-Control: no-cache, no-store, must-revalidate\r\n Date: Mon, 09 Mar 2020 16:58:33 GMT\r\n Connection: keep-alive\r\n

\r\n

[HTTP response 1/1]

[Request URI: <http://detectportal.firefox.com/success.txt>] File Data: 8 bytes

Line-based text data: text/plain (1 lines)

## Пакети для відповідей 16-17:

861 6.299418 192.168.0.102 128.119.245.12 HTTP 549 GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1

Frame 861: 549 bytes on wire (4392 bits), 549 bytes captured (4392 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99), Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12

Transmission Control Protocol, Src Port: 2378, Dst Port: 80, Seq: 1, Ack: 1, Len: 495 Hypertext Transfer Protocol

GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1\r\n 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/80.0.3987.132 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,en-US;q=0.8,en;q=0.5,uk;q=0.3

\r\n

[Full request URI: <http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html>] [HTTP request 1/3]

[Response in frame: 884] [Next request in frame: 949]

No. Time Source Destination Protocol Length Info 884 6.425154 128.119.245.12 192.168.0.102 HTTP 1127HTTP/1.1 200 OK (text/html)

Frame 884: 1127 bytes on wire (9016 bits), 1127 bytes captured (9016 bits) on interface 0

Ethernet II, Src: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa), Dst: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99) Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102

Transmission Control Protocol, Src Port: 80, Dst Port: 2378, Seq: 1, Ack: 496, Len: 1073 Hypertext Transfer Protocol

HTTP/1.1 200 OK\r\n

Date: Mon, 09 Mar 2020 18:26:30 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, 09 Mar 2020 05:59:01 GMT\r\n

ETag: "2ca-5a065b3267fa9"\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 1/3]

[Time since request: 0.125736000 seconds] [Request in frame: 861]

[Next request in frame: 949]

[Next response in frame: 1023]

[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 949 6.520478 192.168.0.102 128.119.245.12 HTTP 481 GET /pearson.png HTTP/1.1

Frame 949: 481 bytes on wire (3848 bits), 481 bytes captured (3848 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99), Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12

Transmission Control Protocol, Src Port: 2378, Dst Port: 80, Seq: 496, Ack: 1074, Len: 427 Hypertext Transfer Protocol

GET /pearson.png HTTP/1.1\r\n 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/80.0.3987.132 Safari/537.36\r\n

Accept: image/webp,image/apng,image/\*,\*/\*;q=0.8\r\n

Referer: <http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n> Accept-Encoding: gzip, deflate\r\n

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3

\r\n

[Full request URI: [http://gaia.cs.umass.edu/pearson.png]](http://gaia.cs.umass.edu/pearson.png) [HTTP request 2/3]

[Prev request in frame: 861] [Response in frame: 1023] [Next request in frame: 1732]

No. Time Source Destination Protocol Length Info 1023 6.659942 128.119.245.12 192.168.0.102 HTTP 745 HTTP/1.1 200 OK (PNG)

Frame 1023: 745 bytes on wire (5960 bits), 745 bytes captured (5960 bits) on interface 0

Ethernet II, Src: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa), Dst: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99) Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102

Transmission Control Protocol, Src Port: 80, Dst Port: 2378, Seq: 3994, Ack: 923, Len: 691

[3 Reassembled TCP Segments (3611 bytes): #1021(1460), #1022(1460), #1023(691)]

Hypertext Transfer Protocol HTTP/1.1 200 OK\r\n

Date: Mon, 09 Mar 2020 18:26:31 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

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: 0.139464000 seconds] [Prev request in frame: 861]

[Prev response in frame: 884] [Request in frame: 949] [Next request in frame: 1732]

[Next response in frame: 1856]

[Request URI: [http://gaia.cs.umass.edu/pearson.png]](http://gaia.cs.umass.edu/pearson.png) File Data: 3267 bytes

Portable Network Graphics

No. Time Source Destination Protocol Length Info

1031 6.661353 192.168.0.102 128.119.245.12 HTTP 495 GET /~kurose/cover\_5th\_ed.jpg HTTP/1.1

Frame 1031: 495 bytes on wire (3960 bits), 495 bytes captured (3960 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99), Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12

Transmission Control Protocol, Src Port: 2381, Dst Port: 80, Seq: 1, Ack: 1, Len: 441 Hypertext Transfer Protocol

GET /~kurose/cover\_5th\_ed.jpg HTTP/1.1\r\n Host: manic.cs.umass.edu\r\n

Connection: keep-alive\r\n

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko)

Chrome/80.0.3987.132 Safari/537.36\r\n

Accept: image/webp,image/apng,image/\*,\*/\*;q=0.8\r\n

Referer: <http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n> Accept-Encoding: gzip, deflate\r\n

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3

\r\n

[Full request URI: [http://manic.cs.umass.edu/~kurose/cover\_5th\_ed.jpg]](http://manic.cs.umass.edu/~kurose/cover_5th_ed.jpg) [HTTP request 1/1]

No. Time Source Destination Protocol Length Info 1732 7.417241 192.168.0.102 128.119.245.12 HTTP 481 GET /favicon.ico HTTP/1.1

Frame 1732: 481 bytes on wire (3848 bits), 481 bytes captured (3848 bits) on interface 0

Ethernet II, Src: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99), Dst: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa) Internet Protocol Version 4, Src: 192.168.0.102, Dst: 128.119.245.12

Transmission Control Protocol, Src Port: 2378, Dst Port: 80, Seq: 923, Ack: 4685, Len: 427 Hypertext Transfer Protocol

GET /favicon.ico HTTP/1.1\r\n 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/80.0.3987.132 Safari/537.36\r\n

Accept: image/webp,image/apng,image/\*,\*/\*;q=0.8\r\n

Referer: <http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file4.html\r\n> Accept-Encoding: gzip, deflate\r\n

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3

\r\n

[Full request URI: [http://gaia.cs.umass.edu/favicon.ico]](http://gaia.cs.umass.edu/favicon.ico) [HTTP request 3/3]

[Prev request in frame: 949] [Response in frame: 1856]

No. Time Source Destination Protocol Length Info

1856 7.544480 128.119.245.12 192.168.0.102 HTTP 538 HTTP/1.1 404 Not Found (text/html)

Frame 1856: 538 bytes on wire (4304 bits), 538 bytes captured (4304 bits) on interface 0

Ethernet II, Src: Tp-LinkT\_ae:15:aa (30:b5:c2:ae:15:aa), Dst: 42:9f:54:41:b6:99 (42:9f:54:41:b6:99)

Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.0.102

Transmission Control Protocol, Src Port: 80, Dst Port: 2378, Seq: 4685, Ack: 1350, Len: 484 Hypertext Transfer Protocol

HTTP/1.1 404 Not Found\r\n

Date: Mon, 09 Mar 2020 18:26:32 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

Keep-Alive: timeout=5, max=98\r\n Connection: Keep-Alive\r\n

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

\r\n

[HTTP response 3/3]

[Time since request: 0.127239000 seconds] [Prev request in frame: 949]

[Prev response in frame: 1023] [Request in frame: 1732]

[Request URI: [http://gaia.cs.umass.edu/favicon.ico]](http://gaia.cs.umass.edu/favicon.ico) File Data: 209 bytes

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

# Контрольні запитання:

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

Обидва використовують версію 1.1

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

Американську англійську мову

Accept-Language: ru,en-US;q=0.8,en;q=0.5,uk;q=0.3

1. **Які IP-адреси вашого комп’ютера та цільового веб-сервера?**

Мого компютера: 192.168.0.102

Веб-сервера: 128.119.245.12

1. **Який статусний код сервер повернув у відповіді вашому браузеру?**

200 OK

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

Sun, 08 Mar 2020 06:59:03 GMT

1. **Скільки байт контенту повертається сервером?**

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1. **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.**

Не помітила

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

Ні, немає

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

Так

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

Ні, немає

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

304 Not Modified, ні

1. **Скільки повідомлень HTTP GET було відправлено вашим браузером?**

Одне

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

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1. **Який код та опис статусу був у відповіді сервера?**

200 OK

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

Так, таким чином починається перший пакет протоколу TCP

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

6 запитів.

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

Послідовно, за часом надходження відповідей та адресами.

Висновки: В процесі виконання даної лабораторної роботи ми розглядали протоколи HTTP, досліджували їх з метою отримання більшої інформації про дослідження мережевих протоколів.