Mr. Phot Koseekrainiramon z5387411

COMP3331 Lab2

Exercise 3: Using Wireshark to understand basic HTTP request/response message

```
▶ Frame 10: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
▶ Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
▶ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
▶ Transmission Control Protocol, Src Port: 4127, Dst Port: 80, Seq: 1, Ack: 1, Len: 501
▼ Hypertext Transfer Protocol
  ▼ GET /ethereal-labs/lab2-1.html HTTP/1.1\r\n
    ▼ [Expert Info (Chat/Sequence): GET /ethereal-labs/lab2-1.html HTTP/1.1\r\n]
        [GET /ethereal-labs/lab2-1.html HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
      Request Method: GET
      Request URI: /ethereal-labs/lab2-1.html
      Request Version: HTTP/1.1
    Host: gaia.cs.umass.edu\r\n
    User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
    Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
    Accept-Language: en-us, en;q=0.50\r\n
    Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
    Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
    Keep-Alive: 300\r\n
    Connection: keep-alive\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-1.html]
    [HTTP request 1/2]
    [Response in frame: 12]
    [Next request in frame: 13]
```

```
▶ Frame 12: 439 bytes on wire (3512 bits), 439 bytes captured (3512 bits)
▶ Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
▶ Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
▶ Transmission Control Protocol, Src Port: 80, Dst Port: 4127, Seq: 1, Ack: 502, Len: 385
▼ 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, 23 Sep 2003 05:29:50 GMT\r\n
    Server: Apache/2.0.40 (Red Hat Linux)\r\n
    Last-Modified: Tue, 23 Sep 2003 05:29:00 GMT\r\n
    ETag: "1bfed-49-79d5bf00"\r\n
    Accept-Ranges: bytes\r\n
  ▶ Content-Length: 73\r\n
    Keep-Alive: timeout=10, max=100\r\n
    Connection: Keep-Alive\r\n
    Content-Type: text/html; charset=ISO-8859-1\r\n
    \r\n
    [HTTP response 1/2]
    [Time since request: 0.024143000 seconds]
    [Request in frame: 10]
    [Next request in frame: 13]
    [Next response in frame: 14]
    [Request URI: http://gaia.cs.umass.edu/favicon.ico]
    File Data: 73 bytes
▼ Line-based text data: text/html (3 lines)
    <html>\n
    Congratulations.  You've downloaded the file lab2-1.html!\n
    </html>\n
```

1. OK with a status code 200.

2. It was last modified on 23 Sep 2003, 05:29:00. It has a DATE header with a slightly different time (05:29:50).

3. The connection is persistent since it has a Keep-Alive header with Keep-Alive connection (via a Connection header). Keep-Alive connection is one type of persistent connection.

4. 73 bytes are being returned.

5. The data contains in the packet is:

<html>\n

Congratulations. You've downloaded the file lab2-1.html!\n

</html>\n

Exercise 4: Using Wireshark to understand the HTTP CONDITIONAL GET/response interaction

```
▶ Frame 8: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
▶ Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
▶ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
▶ Transmission Control Protocol, Src Port: 4247, Dst Port: 80, Seq: 1, Ack: 1, Len: 501
▼ Hypertext Transfer Protocol
  ▼ GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n
    ▼ [Expert Info (Chat/Sequence): GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n]
        [GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
      Request Method: GET
      Request URI: /ethereal-labs/lab2-2.html
      Request Version: HTTP/1.1
    Host: gaia.cs.umass.edu\r\n
    User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
    Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
    Accept-Language: en-us, en;q=0.50\r\n
    Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
    Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
    Keep-Alive: 300\r\n
    Connection: keep-alive\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
    [HTTP request 1/2]
    [Response in frame: 10]
    [Next request in frame: 14]

▶ Frame 10: 739 bytes on wire (5912 bits), 739 bytes captured (5912 bits)
▶ Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
▶ Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
▶ Transmission Control Protocol, Src Port: 80, Dst Port: 4247, Seq: 1, Ack: 502, Len: 685
▼ 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, 23 Sep 2003 05:35:50 GMT\r\n
    Server: Apache/2.0.40 (Red Hat Linux)\r\n
    Last-Modified: Tue, 23 Sep 2003 05:35:00 GMT\r\n
    ETag: "1bfef-173-8f4ae900"\r\n
    Accept-Ranges: bytes\r\n
  ▶ Content-Length: 371\r\n
    Keep-Alive: timeout=10, max=100\r\n
    Connection: Keep-Alive\r\n
    Content-Type: text/html; charset=ISO-8859-1\r\n
    \r\n
    [HTTP response 1/2]
    [Time since request: 0.026634000 seconds]
    [Request in frame: 8]
    [Next request in frame: 14]
    [Next response in frame: 15]
    [Request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
    File Data: 371 bytes
▼ Line-based text data: text/html (10 lines)
    \n
    <html>\n
    \n
    Congratulations again!  Now you've downloaded the file lab2-2.html. <br>\n
    This file's last modification date will not change.  <p>\n
    Thus  if you download this multiple times on your browser, a complete copy <br>\n
    will only be sent once by the server due to the inclusion of the IN-MODIFIED-SINCE<br>\n
    field in your browser's HTTP GET request to the server.\n
    \n
    </html>\n
```

1. The first HTTP GET request has no "IF-MODIFIED-SINCE" line.

2. The response indicates the last time the requested file was modified via a Last-Modified header (Tue, 23 Sep 2003 05:35:00 GMT).

```
▶ Frame 14: 668 bytes on wire (5344 bits), 668 bytes captured (5344 bits)
▶ Ethernet II, Src: Dell_4f:36:23 (00:08:74:4f:36:23), Dst: LinksysG_da:af:73 (00:06:25:da:af:73)
▶ Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
▶ Transmission Control Protocol, Src Port: 4247, Dst Port: 80, Seq: 502, Ack: 686, Len: 614
▼ Hypertext Transfer Protocol
  ▼ GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n
    ▼ [Expert Info (Chat/Sequence): GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n]
        [GET /ethereal-labs/lab2-2.html HTTP/1.1\r\n]
        [Severity level: Chat]
        [Group: Sequence]
      Request Method: GET
      Request URI: /ethereal-labs/lab2-2.html
      Request Version: HTTP/1.1
    Host: gaia.cs.umass.edu\r\n
    User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01\r\n
    Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,video/x-mng,image/png,image/jpeg,image/gif;q=0.2,text/css,*/*;q=0.1\r\n
    Accept-Language: en-us, en;q=0.50\r\n
    Accept-Encoding: gzip, deflate, compress;q=0.9\r\n
    Accept-Charset: ISO-8859-1, utf-8;q=0.66, *;q=0.66\r\n
    Keep-Alive: 300\r\n
    Connection: keep-alive\r\n
    If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT\r\n
    If-None-Match: "1bfef-173-8f4ae900"\r\n
    Cache-Control: max-age=0\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
    [HTTP request 2/2]
    [Prev request in frame: 8]
    [Response in frame: 15]

▶ Frame 15: 243 bytes on wire (1944 bits), 243 bytes captured (1944 bits)
▶ Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Dell_4f:36:23 (00:08:74:4f:36:23)
▶ Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.102
▶ Transmission Control Protocol, Src Port: 80, Dst Port: 4247, Seq: 686, Ack: 1116, Len: 189
▼ 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, 23 Sep 2003 05:35:53 GMT\r\n
    Server: Apache/2.0.40 (Red Hat Linux)\r\n
    Connection: Keep-Alive\r\n
    Keep-Alive: timeout=10, max=99\r\n
    ETag: "1bfef-173-8f4ae900"\r\n
    \r\n
    [HTTP response 2/2]
    [Time since request: 0.022826000 seconds]
    [Prev request in frame: 8]
    [Prev response in frame: 10]
    [Request in frame: 14]
    [Request URI: http://gaia.cs.umass.edu/ethereal-labs/lab2-2.html]
```

3. There's a "If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT" and a "If-None-Match: "1bfef-173-8f4ae900"".

4. Not modified with a status code 304. The server didn't return the file's contents because there are no more recent versions of the file.

5. 2nd response message's Etag is "1bfef-173-8f4ae900" which is the same as 1st response's ("1bfef-173-8f4ae900"). It is used to check the most recent data and to make conditional requests. Usually used for dynamic content.

Exercise 5: Ping Client

Server-side: Client-side:

```
z5387411@vx07:~/Downloads$ java PingServer 5077
Received from 127.0.0.1: PING 3331 1686658222411
  Reply not sent.
Received from 127.0.0.1: PING 3332 1686658223106
  Reply sent.
Received from 127.0.0.1: PING 3333 1686658223285
  Reply sent.
Received from 127.0.0.1: PING 3334 1686658223299
  Reply not sent.
Received from 127.0.0.1: PING 3335 1686658223900
  Reply sent.
Received from 127.0.0.1: PING 3336 1686658224009
  Reply sent.
Received from 127.0.0.1: PING 3337 1686658224109
  Reply not sent.
Received from 127.0.0.1: PING 3338 1686658224710
  Reply sent.
Received from 127.0.0.1: PING 3339 1686658224751
  Reply sent.
Received from 127.0.0.1: PING 3340 1686658224941
  Reply sent.
Received from 127.0.0.1: PING 3341 1686658225124
  Reply sent.
Received from 127.0.0.1: PING 3342 1686658225166
  Reply sent.
Received from 127.0.0.1: PING 3343 1686658225191
  Reply sent.
Received from 127.0.0.1: PING 3344 1686658225337
  Reply sent.
Received from 127.0.0.1: PING 3345 1686658225360
  Reply sent.
```

```
z5387411@vx07:~/Downloads$ java PingClient 127.0.0.1 5077
ping to 127.0.0.1, seq = 3331, time out
ping to 127.0.0.1, seq = 3332, rtt = 173 ms
ping to 127.0.0.1, seq = 3333, rtt = 14 ms
ping to 127.0.0.1, seq = 3334, time out
ping to 127.0.0.1, seq = 3335, rtt = 109 ms
ping to 127.0.0.1, seq = 3336, rtt = 100 ms
ping to 127.0.0.1, seq = 3337, time out
ping to 127.0.0.1, seq = 3338, rtt = 40 ms
ping to 127.0.0.1, seq = 3339, rtt = 189 ms
ping to 127.0.0.1, seq = 3340, rtt = 182 ms
ping to 127.0.0.1, seq = 3341, rtt = 41 ms
ping to 127.0.0.1, seq = 3342, rtt = 24 ms
ping to 127.0.0.1, seq = 3343, rtt = 146 ms
ping to 127.0.0.1, seq = 3344, rtt = 23 ms
ping to 127.0.0.1, seq = 3345, rtt = 29 ms
The minimum RTTs of all packets received successfully is 14
The maximum RTTs of all packets received successfully is 189
The average RTTs of all packets received successfully is 89
```