

COMP3331 LAB02 Report

Exercise 3.

Question 1.

```
▼ 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]
```

```
▼ 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
        [Content length: 73]
        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/ethereal-labs/lab2-1.html]
        File Data: 73 bytes
```

The status code is “200”, and the returned phrase is “OK”.

Question 2.

1. The last modified date was Tuesday, 23rd of September 2003, 05:29:00 GMT.
2. The response contains a “DATE Header” which is in the row of saying “Date”.
3. Although both Date and Last-Modified contain the date and time, the DATE Header indicates when the message was generated while the Last-Modified when the message was updated to latest version and whether the browser should use the cached copy or download new version to the website.

Question 3.

1. Since the Connection Header says “Keep-Alive”, it means that the connection between the browser and the server is using persistent HTTP.
2. With the persistent HTTP, the server keeps the TCP connection open after sending the response (message). However, when using non-persistent HTTP, the browser and server need to connect TCP every time before they send and receive the request and response.

Question 4.

From the Content-Length Header in the second HTTP message from the filtered packet-listing window, it says 73 bytes.

Question 5.

```
▼ Line-based text data: text/html (3 lines)
<html>\n
Congratulations.  You've downloaded the file lab2-1.html!\n
</html>\n
```

It could be found in the Line-based text data toggle list, which is in the second HTTP message from the filtered packet-listing window.

Exercise 4.

Question 1.

```
▼ 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]
      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]
```

The image above shows the first HTTP message from the filtered packet-listing window, it does not include IF-MODIFIED-SINCE Header.

Question 2.

```
▼ 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
        [Content length: 371]
      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
```

From the image above we could see that there is a Last-Modified Header, which means this message indicated the last time that the requested file was modified, and the date and time was Tuesday 23rd of September 2003, 05:35:00 GMT.

Question 3.

```
▼ 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]
```

The image above shows the second GET HTTP message from the browser to the server. We could see that the If-Modified-Since Header and If-None-Match Header are indicated in the message.

The If-Modified-Since Header contains the information of the date and time, Tuesday 23rd of September 2003, 05:35:00 GMT.

The If-None-Match Header contains the information of the ETag, 1bfef-173-8f4ae900.

Question 4.

```
▼ 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]
```

1. The status code is 304 while the returned phrase is Not Modified.
2. This message sent from the server does not return the content of the file.
3. The browser (Client) still has the old version of downloaded (local) copy, and the response version was still same as the previous GET HTTP request, it was not modified (it is still in HTTP 1.1). Therefore, it is redundant to transmit the same requested resource again.

Question 5.

Date: Tue, 23 Sep 2003 05:35:50 GMT\r\n	Date: Tue, 23 Sep 2003 05:35:53 GMT\r\n
Server: Apache/2.0.40 (Red Hat Linux)\r\n	Server: Apache/2.0.40 (Red Hat Linux)\r\n
Last-Modified: Tue, 23 Sep 2003 05:35:00 GMT\r\n	Connection: Keep-Alive\r\n
ETag: "1bfef-173-8f4ae900"\r\n	Keep-Alive: timeout=10, max=99\r\n
	ETag: "1bfef-173-8f4ae900"\r\n

1. The value of ETag Header in the second HTTP response is 1bfef-173-8f4ae900.
ETag is used for determining the version of a resource from a server that is requested by a browser. If the resource is changed, a new ETag will be generated by the server for the resource. If the old and new ETag don't match each other, then the browser will request the same resource from the server to update the outdated content.
2. The left image above is the first HTTP response, and the right image is the second HTTP response. We could see that both ETags have the same value. Therefore, the ETag has not been changed.

Exercise 5.

Using Java programming language to complete this exercise.

PingServer 1024 Output:

```
z5237541@wagner:~/CSE/cs3331$ cd lab02
z5237541@wagner:~/CSE/cs3331/lab02$ java PingServer 1024
Received from 127.0.0.1: ping3331 1655520777093
  Reply not sent.
Received from 127.0.0.1: ping3332 1655520777779
  Reply sent.
Received from 127.0.0.1: ping3333 1655520777946
  Reply not sent.
Received from 127.0.0.1: ping3334 1655520778547
  Reply sent.
Received from 127.0.0.1: ping3335 1655520778717
  Reply sent.
Received from 127.0.0.1: ping3336 1655520778825
  Reply sent.
Received from 127.0.0.1: ping3337 1655520778948
  Reply sent.
Received from 127.0.0.1: ping3338 1655520779140
  Reply sent.
Received from 127.0.0.1: ping3339 1655520779261
  Reply not sent.
Received from 127.0.0.1: ping3340 1655520779862
  Reply not sent.
Received from 127.0.0.1: ping3341 1655520780462
  Reply sent.
Received from 127.0.0.1: ping3342 1655520780592
  Reply sent.
Received from 127.0.0.1: ping3343 1655520780605
  Reply sent.
Received from 127.0.0.1: ping3344 1655520780635
  Reply sent.
█
```

PingClient 127.0.0.1 1024 Output:

```
Connecting to unsw_cse...
z5237541@wagner:~/CSE$ cd cs3331
z5237541@wagner:~/CSE/cs3331$ cd lab02
z5237541@wagner:~/CSE/cs3331/lab02$ java PingClient 127.0.0.1 1024
ping to /127.0.0.1, seq = 3331, time out
ping to /127.0.0.1, seq = 3332, rtt = 152 ms
ping to /127.0.0.1, seq = 3333, time out
ping to /127.0.0.1, seq = 3334, rtt = 170 ms
ping to /127.0.0.1, seq = 3335, rtt = 107 ms
ping to /127.0.0.1, seq = 3336, rtt = 123 ms
ping to /127.0.0.1, seq = 3337, rtt = 192 ms
ping to /127.0.0.1, seq = 3338, rtt = 121 ms
ping to /127.0.0.1, seq = 3339, time out
ping to /127.0.0.1, seq = 3340, time out
ping to /127.0.0.1, seq = 3341, rtt = 129 ms
ping to /127.0.0.1, seq = 3342, rtt = 13 ms
ping to /127.0.0.1, seq = 3343, rtt = 30 ms
ping to /127.0.0.1, seq = 3344, rtt = 77 ms

-----Report Output-----

Minimum round-trip time is: 13
Average round-trip time is: 111
Maximum round-trip time is: 192

z5237541@wagner:~/CSE/cs3331/lab02$ █
```