

Exercise 3

http-ethereal-trace-1 [Wireshark 1.12.1 (Git Rev Unknown from unknown)]							
File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help							
Filter: http Expression... Clear Apply Save							
No.	Time	Source	Destination	Protocol	Length	Info	
10	4.694850	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-1.html HTTP/1.1	
12	4.718993	128.119.245.12	192.168.1.102	HTTP	439	HTTP/1.1 200 OK (text/html)	
13	4.724332	192.168.1.102	128.119.245.12	HTTP	541	GET /favicon.ico HTTP/1.1	
14	4.750366	128.119.245.12	192.168.1.102	HTTP	1395	HTTP/1.1 404 Not Found (text/html)	

▶ Frame 10: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)

▶ Ethernet II, Src: DellComp_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 (192.168.1.102), Dst: 128.119.245.12 (128.119.245.12)

▶ Transmission Control Protocol, Src Port: 4127 (4127), Dst Port: 80 (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]

http-ethereal-trace-1 [Wireshark 1.12.1 (Git Rev Unknown from unknown)]							
File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help							
Filter: http Expression... Clear Apply Save							
No.	Time	Source	Destination	Protocol	Length	Info	
10	4.694850	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-1.html HTTP/1.1	
12	4.718993	128.119.245.12	192.168.1.102	HTTP	439	HTTP/1.1 200 OK (text/html)	
13	4.724332	192.168.1.102	128.119.245.12	HTTP	541	GET /favicon.ico HTTP/1.1	
14	4.750366	128.119.245.12	192.168.1.102	HTTP	1395	HTTP/1.1 404 Not Found (text/html)	

▶ 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: DellComp_4f:36:23 (00:08:74:4f:36:23)

▶ Internet Protocol Version 4, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.1.102 (192.168.1.102)

▶ Transmission Control Protocol, Src Port: 80 (80), Dst Port: 4127 (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]

Request Version: HTTP/1.1

Status Code: 200

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]

▼ Line-based text data: text/html

<html>\n

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

</html>\n

0000 00 00 74 4f 36 23 00 06 25 da af 73 08 00 45 00 ...t06#..%.s..E.

0010 01 a9 b6 fe 40 00 37 06 53 c2 00 77 f5 0c c0 a0 ...@.?.S..W...

0020 01 66 00 50 10 1f 6b a6 54 92 f5 32 66 a7 50 18 ...f.P..k.T..2f.P.

0030 19 20 7a 1c 00 00 48 54 54 50 2f 31 2e 31 20 32 ...z...HT TP/1.1 2

0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ...

Frame (frame), 439 bytes Packets: 17 · Displayed: 4 (23.5%) · Load time: 0:00.000

Question 1:

Status code: 200

Phrase: OK

Question 2:

Last –Modified: Tue, 23 Sep 2003 05:29:00 GMT

Yes. Date: Tue, 23 Sep 2003 05:29:50 GMT

The DATE header refers to the date and time when the server retrieved the object and inserted the object found into response message, then sent the message to client. While the Last –Modified date means the time and date when object was created or last –modified.

Question 3:

It is persistent connection.

‘Connection: keep –alive’.

```
keep-alive: 300\r\n
Connection: keep-alive\r\n
\r\n
```

Question 4:

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
```

Exercise 4

The screenshot shows a Wireshark capture of an HTTP GET request. The packet list shows five packets, with packet 8 selected. The packet details pane shows the structure of the GET request, including the request line, headers, and body. The packet bytes pane shows the raw data of the request.

No.	Time	Source	Destination	Protocol	Length	Info
8	2.331268	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-2.html HTTP/1.1
10	2.357902	128.119.245.12	192.168.1.102	HTTP	739	HTTP/1.1 200 OK (text/html)
14	5.517390	192.168.1.102	128.119.245.12	HTTP	668	GET /ethereal-labs/lab2-2.html HTTP/1.1
15	5.540216	128.119.245.12	192.168.1.102	HTTP	243	HTTP/1.1 304 Not Modified

Frame 8: 555 bytes on wire (4440 bits), 555 bytes captured (4440 bits)
Ethernet II, Src: DellComp_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 (192.168.1.102), Dst: 128.119.245.12 (128.119.245.12)
Transmission Control Protocol, Src Port: 4247 (4247), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 501
Hypertext Transfer Protocol
GET /ethereal-labs/lab2-2.html HTTP/1.1
[Expert Info (Chat/Sequence): GET /ethereal-labs/lab2-2.html HTTP/1.1
[GET /ethereal-labs/lab2-2.html HTTP/1.1
[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
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01
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,css/*;q=0.1
Accept-Language: en-us,en;q=0.50
Accept-Encoding: gzip, deflate, compress;q=0.9
Accept-Charset: ISO-8859-1, utf-8;q=0.66,*;q=0.66
Keep-Alive: 300
Connection: keep-alive
[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 screenshot shows a Wireshark capture of an HTTP 200 OK response. The packet list shows five packets, with packet 10 selected. The packet details pane shows the structure of the response, including the status line, headers, and body. The packet bytes pane shows the raw data of the response.

No.	Time	Source	Destination	Protocol	Length	Info
8	2.331268	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-2.html HTTP/1.1
10	2.357902	128.119.245.12	192.168.1.102	HTTP	739	HTTP/1.1 200 OK (text/html)
14	5.517390	192.168.1.102	128.119.245.12	HTTP	668	GET /ethereal-labs/lab2-2.html HTTP/1.1
15	5.540216	128.119.245.12	192.168.1.102	HTTP	243	HTTP/1.1 304 Not Modified

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: DellComp_4f:36:23 (00:08:74:4f:36:23)
Internet Protocol Version 4, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.1.102 (192.168.1.102)
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 4247 (4247), Seq: 1, Ack: 502, Len: 685
Hypertext Transfer Protocol
HTTP/1.1 200 OK
[Expert Info (Chat/Sequence): HTTP/1.1 200 OK
[HTTP/1.1 200 OK
[Severity Level: Chat]
[Group: Sequence]
Request Version: HTTP/1.1
Status Code: 200
Response Phrase: OK
Date: Tue, 23 Sep 2003 05:35:50 GMT
Server: Apache/2.0.40 (Red Hat Linux)
Last-Modified: Tue, 23 Sep 2003 05:35:00 GMT
ETag: "1bfef-173-8f4ae900"
Accept-Ranges: bytes
Content-Length: 371
Keep-Alive: timeout=10, max=100
Connection: Keep-Alive
Content-Type: text/html; charset=ISO-8859-1
[HTTP response 1/2]
[Time since request: 0.026634000 seconds]
[Request in frame: 8]
[Next request in frame: 14]
[Next response in frame: 15]
Line-based text data: text/html
<html>
<body>
Congratulations again! Now you've downloaded the file lab2-2.html.

This file's last modification date will not change. <p>
Thus if you download this multiple times on your browser, a complete copy

Question 1:

No.

Question 2:

Yes. Last –Modified : Tue, 23 Sep 2003 05:35:00 GMT

Question 3

Filter: http

No.	Time	Source	Destination	Protocol	Length	Info
8	2.331268	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-2.html HTTP/1.1
10	2.357902	128.119.245.12	192.168.1.102	HTTP	739	HTTP/1.1 200 OK (text/html)
14	5.517390	192.168.1.102	128.119.245.12	HTTP	668	GET /ethereal-labs/lab2-2.html HTTP/1.1
15	5.540216	128.119.245.12	192.168.1.102	HTTP	243	HTTP/1.1 304 Not Modified

Frame 14: 668 bytes on wire (5344 bits), 668 bytes captured (5344 bits)
Ethernet II, Src: DellComp_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 (192.168.1.102), Dst: 128.119.245.12 (128.119.245.12)
Transmission Control Protocol, Src Port: 4247 (4247), Dst Port: 80 (80), Seq: 502, Ack: 686, Len: 614

Hypertext Transfer Protocol
GET /ethereal-labs/lab2-2.html HTTP/1.1
[Expert Info (Chat/Sequence): GET /ethereal-labs/lab2-2.html HTTP/1.1
[GET /ethereal-labs/lab2-2.html HTTP/1.1
[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
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.0.2) Gecko/20021120 Netscape/7.01
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,css/*;q=0.1
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip, deflate, compress;q=0.9
Accept-Charset: ISO-8859-1, utf-8;q=0.66,*;q=0.66
Keep-Alive: 300
Connection: keep-alive
If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT
If-None-Match: "1bfef-173-8f4ae900"
Cache-Control: max-age=0
[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]

Yes.

If-Modified-Since: Tue, 23 Sep 2003 05:35:00 GMT
If-None-Match: "1bfef-173-8f4ae900"

Question 4:

Filter: http

No.	Time	Source	Destination	Protocol	Length	Info
8	2.331268	192.168.1.102	128.119.245.12	HTTP	555	GET /ethereal-labs/lab2-2.html HTTP/1.1
10	2.357902	128.119.245.12	192.168.1.102	HTTP	739	HTTP/1.1 200 OK (text/html)
14	5.517390	192.168.1.102	128.119.245.12	HTTP	668	GET /ethereal-labs/lab2-2.html HTTP/1.1
15	5.540216	128.119.245.12	192.168.1.102	HTTP	243	HTTP/1.1 304 Not Modified

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: DellComp_4f:36:23 (00:08:74:4f:36:23)
Internet Protocol Version 4, Src: 128.119.245.12 (128.119.245.12), Dst: 192.168.1.102 (192.168.1.102)
Transmission Control Protocol, Src Port: 80 (80), Dst Port: 4247 (4247), Seq: 686, Ack: 1116, Len: 189

Hypertext Transfer Protocol
HTTP/1.1 304 Not Modified
[Expert Info (Chat/Sequence): HTTP/1.1 304 Not Modified
[HTTP/1.1 304 Not Modified
[Severity level: Chat
[Group: Sequence
Request Version: HTTP/1.1
Status Code: 304
Response Phrase: Not Modified
Date: Tue, 23 Sep 2003 05:35:53 GMT
Server: Apache/2.0.40 (Red Hat Linux)
Connection: Keep-Alive
Keep-Alive: timeout=10, max=99
ETag: "1bfef-173-8f4ae900"
[HTTP response 2/2]
[Time since request: 0.022826000 seconds]
[Prev request in frame: 8]
[Prev response in frame: 10]
[Request in frame: 14]

Status code: 304

Phrase: Not Modified

The contents of the file was not returned explicitly. Because the request message is

in conditional GET method. The contents had been saved in Web cache before. 304 Not Modified means the object was not modified, thus the object saved in cache could be used, and the object would not be sent again in this respond message.

Question 5:

ETag: "1bfef-173-8f4ae900".

It is a 'sign' of an object in server. The server could judge whether the object is modified by using the ETag value. If not modified (then its ETag would not change), returns 304 HTTP status code.

The value didn't change.

Exercise 5

File 'PingClient.py' has been attached.

```
Received from 127.0.0.1: PING 3344 Sun Jun 21 18:42:48 2020
  Reply sent.
Received from 127.0.0.1: PING 3345 Sun Jun 21 18:42:48 2020
  Reply sent.
Received from 127.0.0.1: PING 3331 Sun Jun 21 18:42:52 2020
  Reply sent.
Received from 127.0.0.1: PING 3332 Sun Jun 21 18:42:52 2020
  Reply not sent.
Received from 127.0.0.1: PING 3333 Sun Jun 21 18:42:52 2020
  Reply not sent.
Received from 127.0.0.1: PING 3334 Sun Jun 21 18:42:53 2020
  Reply sent.
Received from 127.0.0.1: PING 3335 Sun Jun 21 18:42:53 2020
  Reply sent.
Received from 127.0.0.1: PING 3336 Sun Jun 21 18:42:53 2020
  Reply sent.
Received from 127.0.0.1: PING 3337 Sun Jun 21 18:42:53 2020
  Reply not sent.
Received from 127.0.0.1: PING 3338 Sun Jun 21 18:42:54 2020
  Reply sent.
Received from 127.0.0.1: PING 3339 Sun Jun 21 18:42:54 2020
  Reply sent.
Received from 127.0.0.1: PING 3340 Sun Jun 21 18:42:54 2020
  Reply sent.
Received from 127.0.0.1: PING 3341 Sun Jun 21 18:42:54 2020
  Reply sent.
Received from 127.0.0.1: PING 3342 Sun Jun 21 18:42:55 2020
  Reply sent.
Received from 127.0.0.1: PING 3343 Sun Jun 21 18:42:55 2020
  Reply not sent.
Received from 127.0.0.1: PING 3344 Sun Jun 21 18:42:55 2020
  Reply not sent.
Received from 127.0.0.1: PING 3345 Sun Jun 21 18:42:56 2020
```

```
wagner % python PingClient.py 127.0.0.1 12000
ping to 127.0.0.1, seq = 3331, rtt = 136 ms
ping to 127.0.0.1, seq = 3332, rtt = 163 ms
ping to 127.0.0.1, seq = 3333, time out
ping to 127.0.0.1, seq = 3334, time out
ping to 127.0.0.1, seq = 3335, rtt = 98 ms
ping to 127.0.0.1, seq = 3336, rtt = 136 ms
ping to 127.0.0.1, seq = 3337, rtt = 60 ms
ping to 127.0.0.1, seq = 3338, rtt = 92 ms
ping to 127.0.0.1, seq = 3339, rtt = 177 ms
ping to 127.0.0.1, seq = 3340, rtt = 29 ms
ping to 127.0.0.1, seq = 3341, rtt = 124 ms
ping to 127.0.0.1, seq = 3342, rtt = 148 ms
ping to 127.0.0.1, seq = 3343, rtt = 63 ms
ping to 127.0.0.1, seq = 3344, rtt = 25 ms
ping to 127.0.0.1, seq = 3345, rtt = 107 ms
rtt min/avg/max = 25/104/177 ms
wagner % python PingClient.py 127.0.0.1 12000
ping to 127.0.0.1, seq = 3331, rtt = 56 ms
ping to 127.0.0.1, seq = 3332, rtt = 77 ms
ping to 127.0.0.1, seq = 3333, rtt = 146 ms
ping to 127.0.0.1, seq = 3334, rtt = 132 ms
ping to 127.0.0.1, seq = 3335, time out
ping to 127.0.0.1, seq = 3336, rtt = 40 ms
ping to 127.0.0.1, seq = 3337, rtt = 155 ms
ping to 127.0.0.1, seq = 3338, time out
ping to 127.0.0.1, seq = 3339, rtt = 37 ms
ping to 127.0.0.1, seq = 3340, rtt = 100 ms
ping to 127.0.0.1, seq = 3341, rtt = 34 ms
ping to 127.0.0.1, seq = 3342, rtt = 161 ms
ping to 127.0.0.1, seq = 3343, rtt = 3 ms
ping to 127.0.0.1, seq = 3344, rtt = 59 ms
ping to 127.0.0.1, seq = 3345, rtt = 100 ms
rtt min/avg/max = 3/85/161 ms
wagner % python PingClient.py 127.0.0.1 12000
ping to 127.0.0.1, seq = 3331, rtt = 156 ms
ping to 127.0.0.1, seq = 3332, time out
ping to 127.0.0.1, seq = 3333, time out
ping to 127.0.0.1, seq = 3334, rtt = 81 ms
ping to 127.0.0.1, seq = 3335, rtt = 174 ms
ping to 127.0.0.1, seq = 3336, rtt = 179 ms
ping to 127.0.0.1, seq = 3337, time out
ping to 127.0.0.1, seq = 3338, rtt = 175 ms
ping to 127.0.0.1, seq = 3339, rtt = 181 ms
ping to 127.0.0.1, seq = 3340, rtt = 95 ms
ping to 127.0.0.1, seq = 3341, rtt = 111 ms
ping to 127.0.0.1, seq = 3342, rtt = 163 ms
ping to 127.0.0.1, seq = 3343, time out
ping to 127.0.0.1, seq = 3344, time out
ping to 127.0.0.1, seq = 3345, rtt = 30 ms
rtt min/avg/max = 30/134/181 ms
wagner %
```