CS 3873: Net-Centric Computing
Lab 1: Examining HTTP with Wireshark

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[Mandatory] Declaration: "I warrant that this is my own work."

Signed by Mahmoud Moustafa

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Signed by _____

Report for Lab Exercise 1:
Examining HTTP with Wireshark

LAB ACTIVITIES:

In this lab, we learnt how to capture packet traces with Wireshark. In particular, we used Wireshark to examine the details of the hypertext transfer protocol (HTTP).

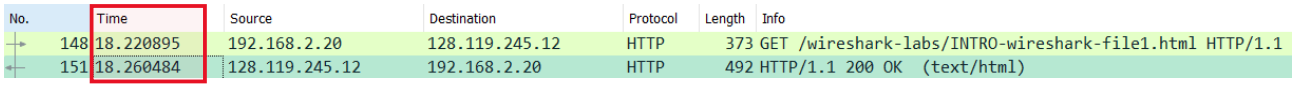
ANSWERS TO LAB QUESTIONS:

The following gives you one example on how to draft your answer to the lab questions.

4. Based on the above trace, answer the following questions:

   a. Select the first HTTP message shown in the packet-listing window. This should be the HTTP GET message that was sent from your computer to the HTTP server. When you select the HTTP GET message, the Ethernet or Ethernet II frame, IPv4 datagram, TCP segment, and HTTP message header information will be displayed in the packet-header window. How long did it take from when the HTTP GET message was sent until the first HTTP response was received?

   Answer: As seen in Fig. 1, the HTTP get message is captured 18.220895 seconds after starting Wireshark, while the first HTTP response is received at 18.260484 seconds after starting Wireshark. It took (18.260484 - 18.220895 = 0.039589) seconds.

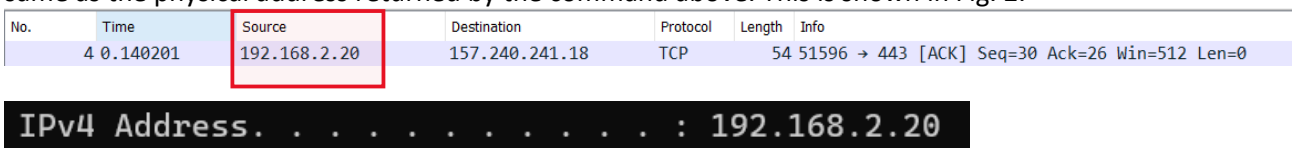


No.	Time	Source	Destination	Protocol	Length	Info
148	18.220895	192.168.2.20	128.119.245.12	HTTP	373	GET /wireshark-labs/INTRO-wireshark-file1.html HTTP/1.1
151	18.260484	128.119.245.12	192.168.2.20	HTTP	492	HTTP/1.1 200 OK (text/html)

Fig. 1. Certain HTTP GET and Response messages in the captured trace.

   b. In the trace you will find IPv4 addresses within the packets. Find an example packet in the trace where the IPv4 address associated with your machine is present. Compare this address with the IPv4 address you can find by using the following command: *ipconfig* on Windows, or *ifconfig* on MacOS or Linux. Running this command also gives a 48-bit physical address for the network interference. This is the MAC (medium access control) address (not discussed in class yet) of your machine. Can you find the MAC address of the packet in the trace? Is it the same as the physical address returned by the above command?

   Answer: Yes, I can find the MAC address of the packet in the trace it is 192.168.2.20. Yes, it is the same as the physical address returned by the command above. This is shown in Fig. 2.



No.	Time	Source	Destination	Protocol	Length	Info
4	0.140201	192.168.2.20	157.240.241.18	TCP	54	51596 → 443 [ACK] Seq=30 Ack=26 Win=512 Len=0

```
IPv4 Address. . . . . . . . . . . : 192.168.2.20
```

Fig.2. The IPv4 addresses

6. Examine your new trace captured in item 5 and answer the following questions:

   a) Inspect the contents of the first HTTP GET request **for the Webpage "lab1.html"** from your browser to the server**3**. Do you see an "If-Modified-Since" line in the HTTP GET?

   Answer: No, I do not see an "If-Modified-Since" line. As shown in the Fig. 3.

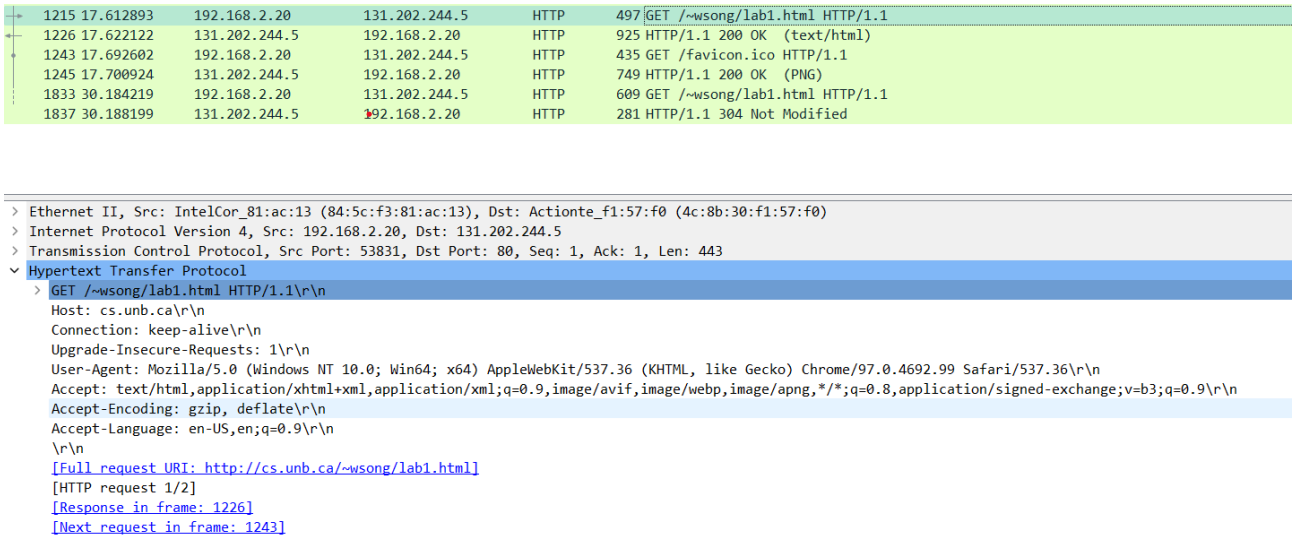


Fig.3. The details of the selected packet (GET … lab1.html)

   b) Inspect the contents of the server response to the first HTTP GET request. Did the server explicitly return the contents of the file? How can you tell?

   Answer: Yes, it returned the content of the file explicitly. I can tell because it is in the "Line_based text data" as shown in Fig.4.

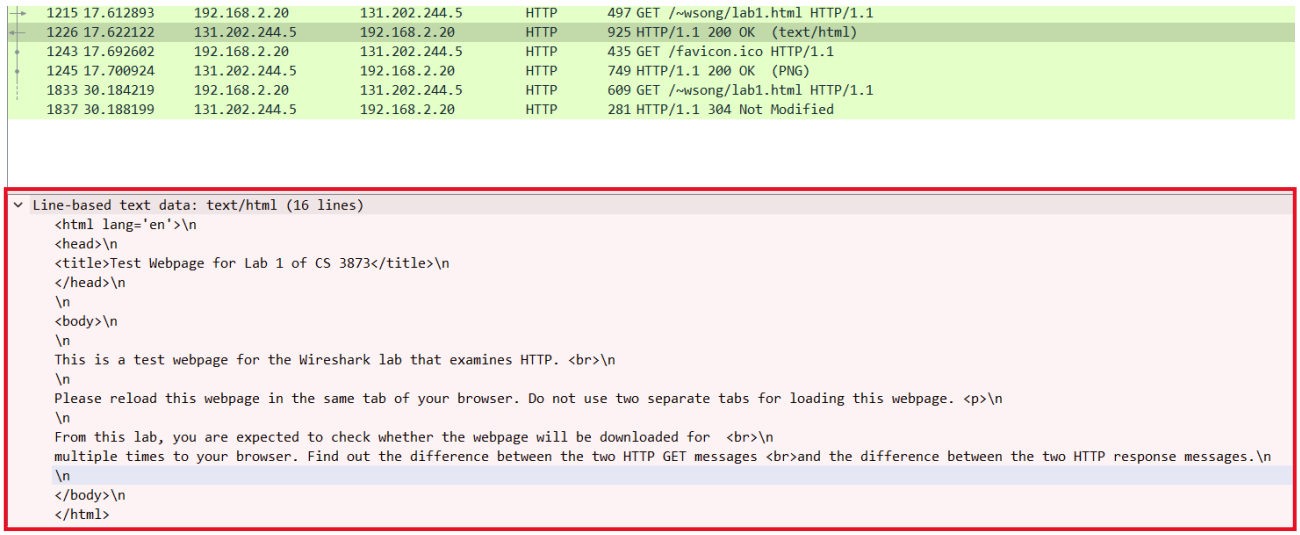


Fig.4. The Line-based text data.

c) Now inspect the contents of the next HTTP GET request **for the Webpage "lab1.html"** from your browser to the server4. Do you see an "If-Modified-Since:" line in the HTTP GET? If so, what information follows the "If-Modified-Since:" header?

Answer: Yes, there is an "If-Modified-Since" line. The information that follows is "Mon, 22 Jan 2018 14:06:41 GMT \r\n\r\n" the date of the last modification of file from the previous GET request. This is shown in Fig.5.

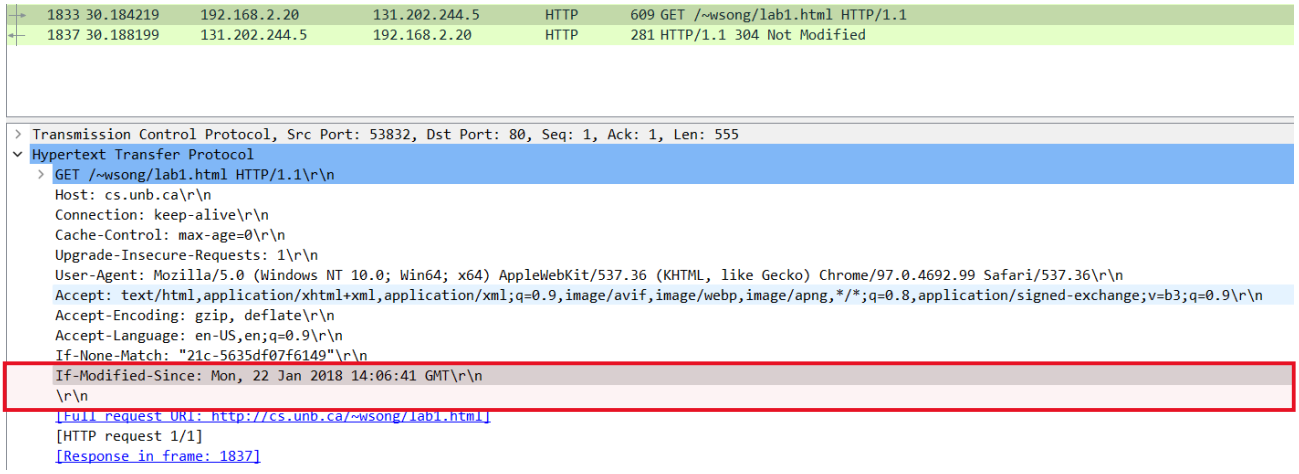


Fig.5. The "If-Modified-Since" line and the information that follows

d) What is the HTTP status code and phrase returned from the server in response to this second HTTP GET for "lab1.html"? Did the server explicitly return the contents of the file? Explain.

Answer: The status code is 304. No, it did not return the contents of the file explicitly because the file has not been modified therefore, the browser retrieved it from its cache. This is shown in Fig.6. That is why we do not see a "Line_based text data" line. If it was modified, we would be able to see the contents of the file under the "Line_based text data" line.

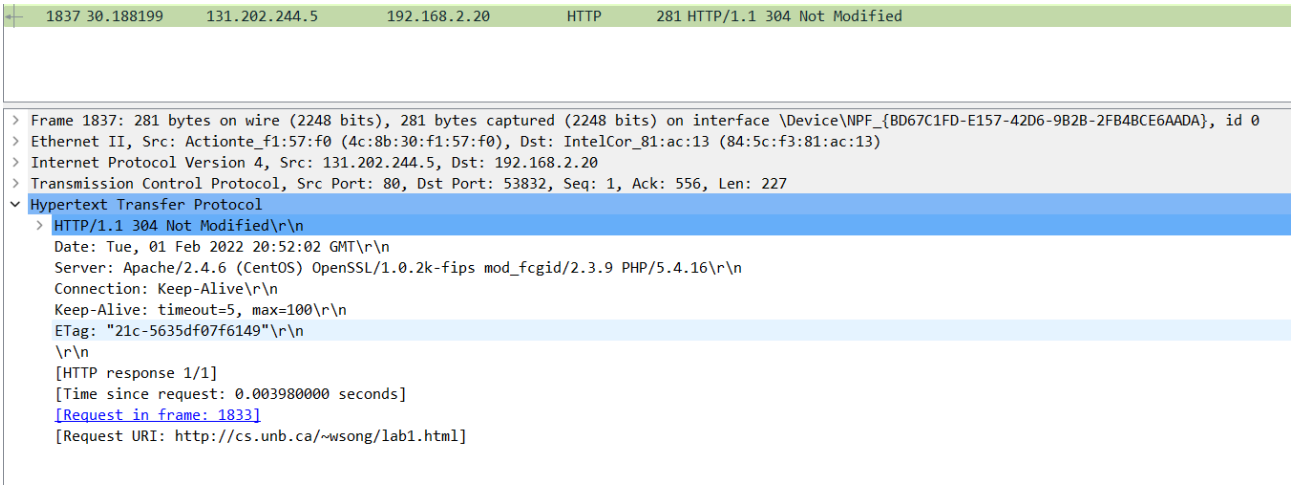


Fig.6. There is no a “Line_based text data” line therefore, no explicit return of file contents.