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9/23/18
CPE 400

HW1

Part 1

1.

a)

a<->b is 1Mb/s

b<->c is 2 Mb/s

transmission delay = (packet length)/(link bandwidth)

transmission delay over link A – B = (1,000*8)/(1,000,000) = 0.008s

transmission delay over link B – C = (1,000*8)/(2,000,000) = 0.004s

b)

nodal processing delay at B = 1ms = 0.001s

queuing delay at B = 3ms = 0.003s

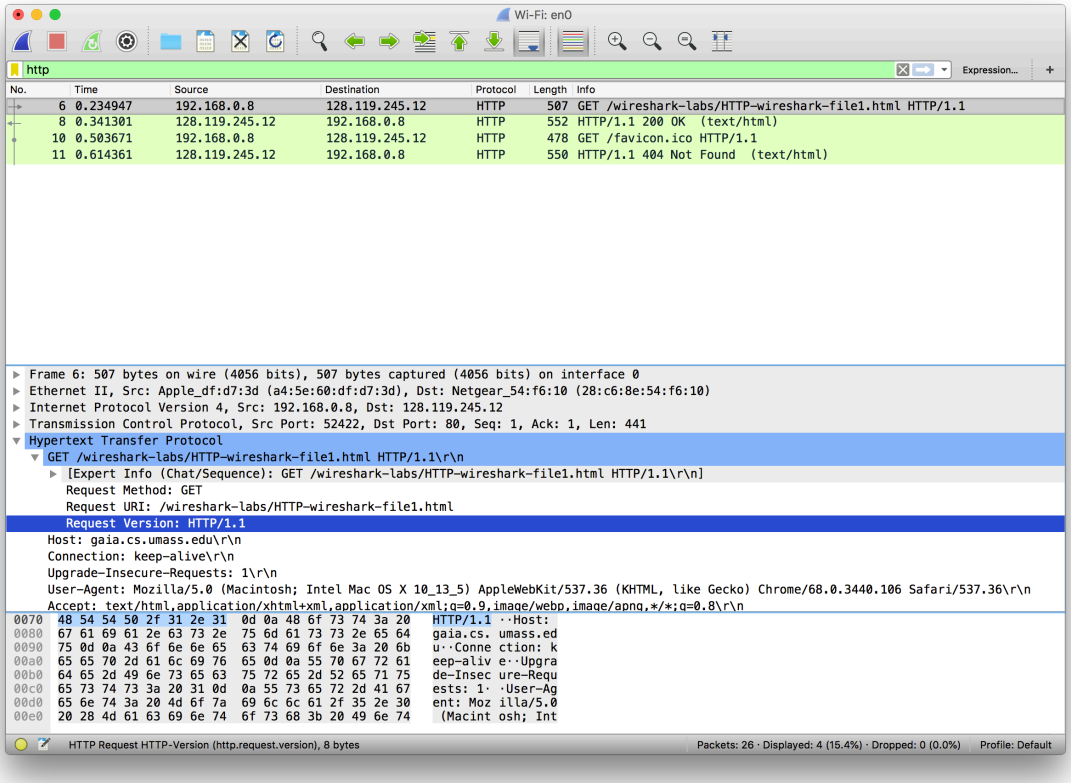
propagation delay at B = 0

Total delay from A to C = 0.008s + = 0.004s + 0.003s + 0.001s = 0.016s

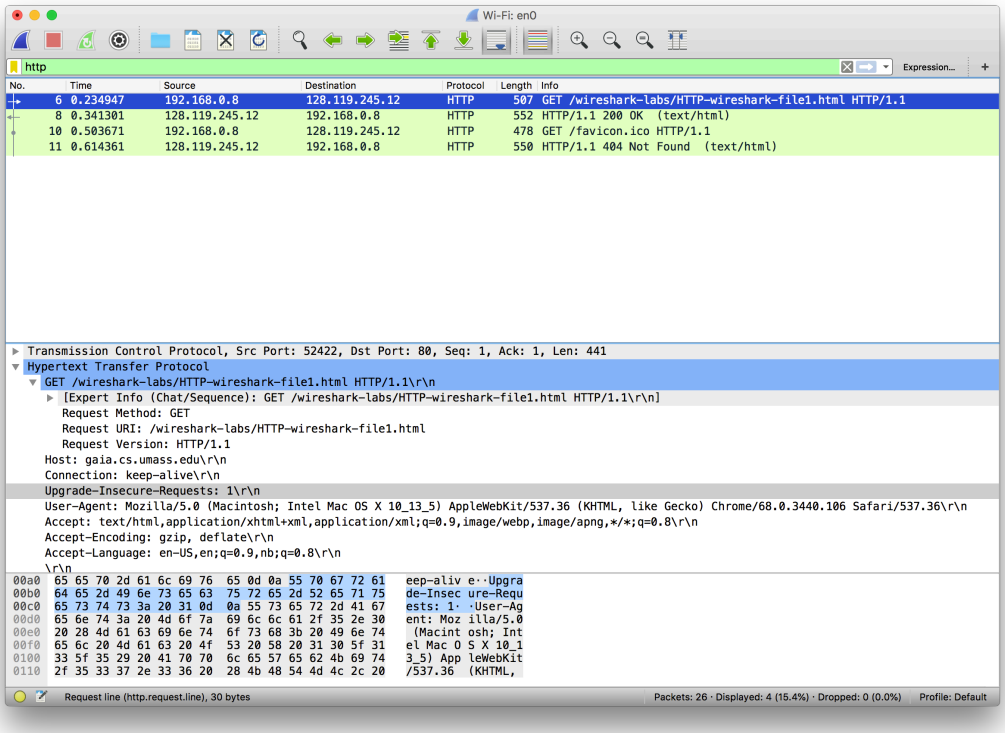
Part 2

2.

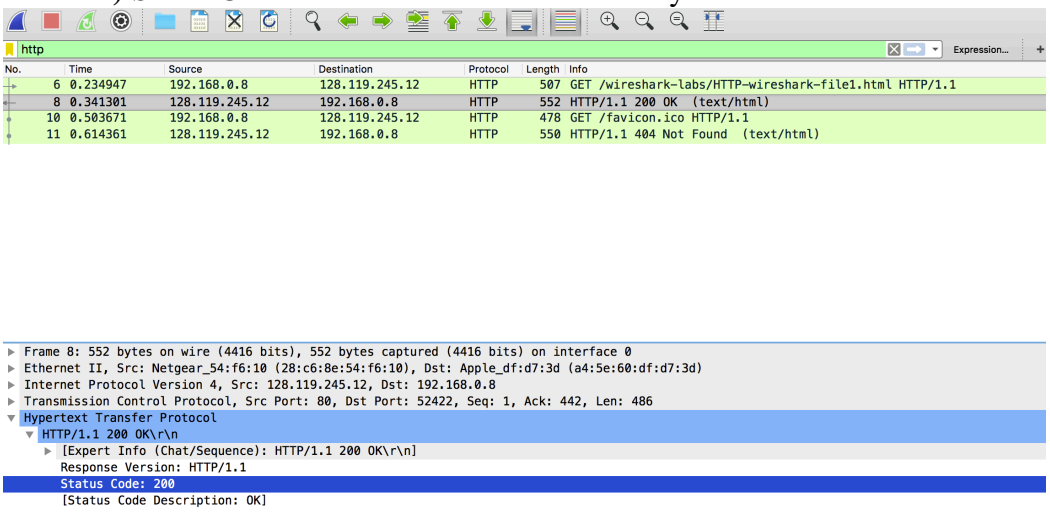
a) HTTP version 1.1 is running



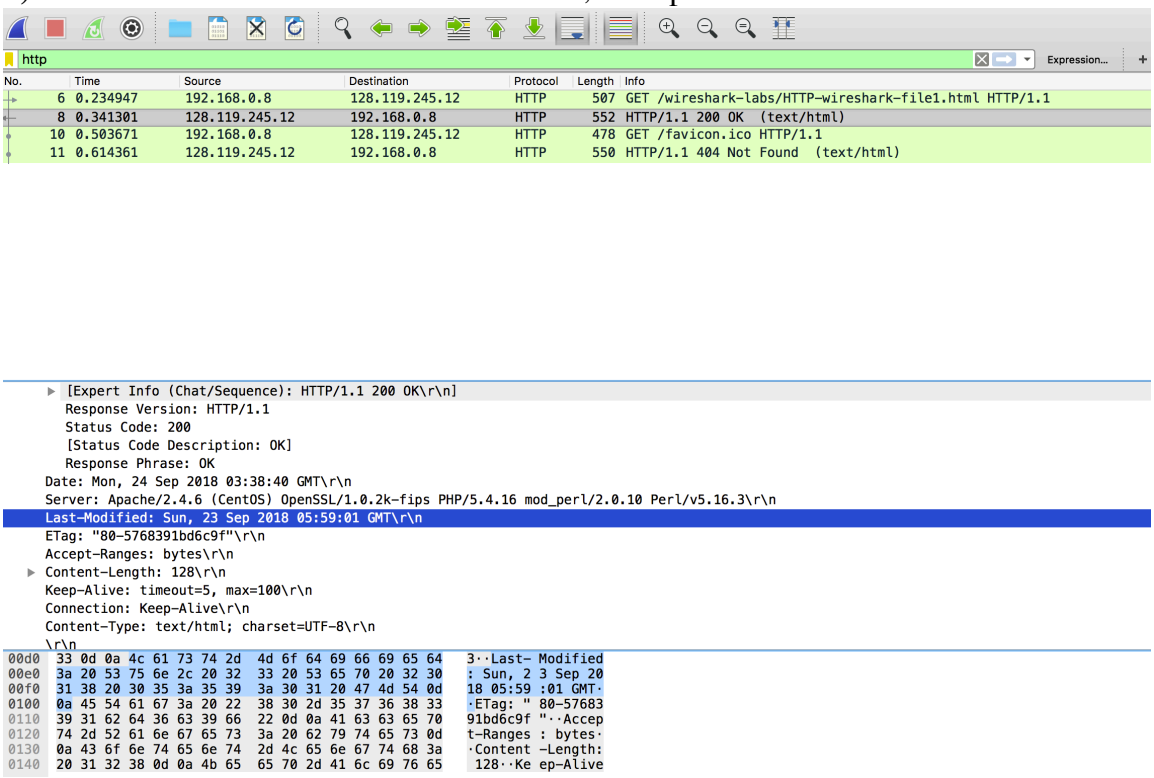
b) My computer's IP address: 192.168.0.8, gaia.cs.umass.edu server IP address: 128.119.245.12



c) Status Code returned from the server to my browser: 200



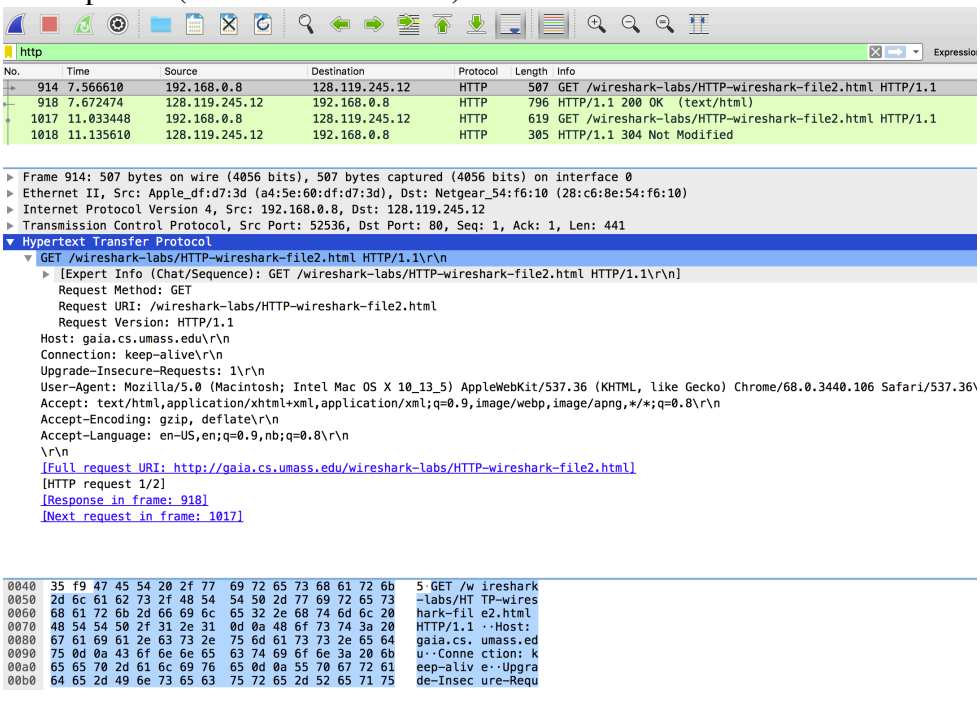
d) The HTML file was last-modified on: Sun, 23 Sep 2018 05:59:01 GMT

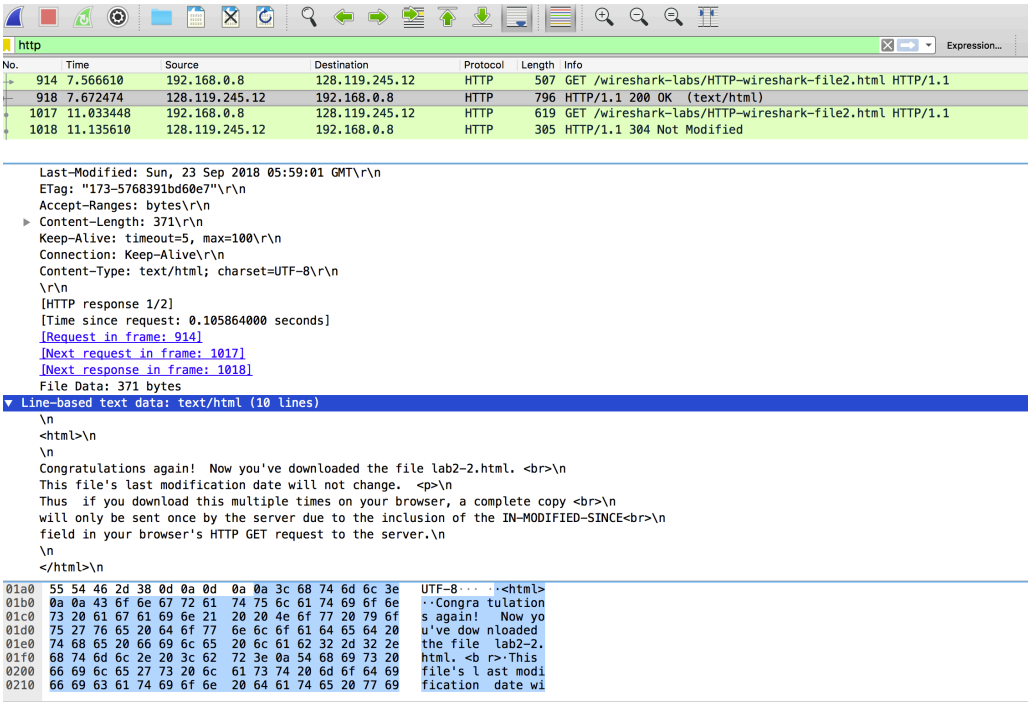


Part 3

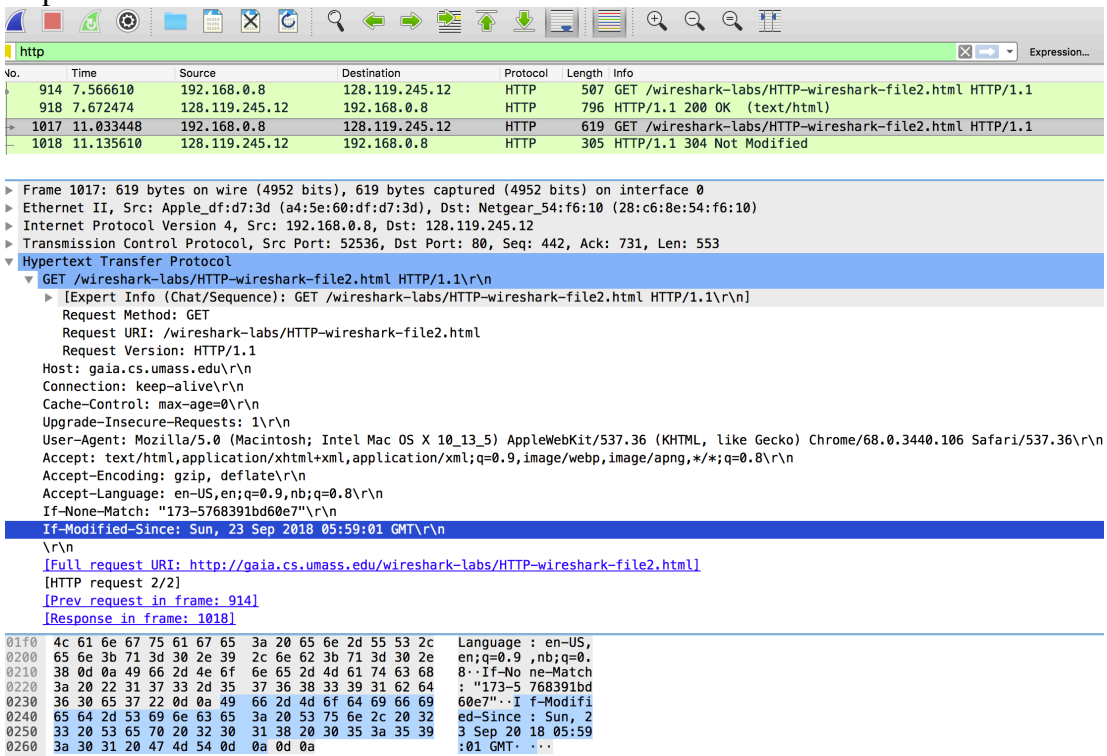
3.

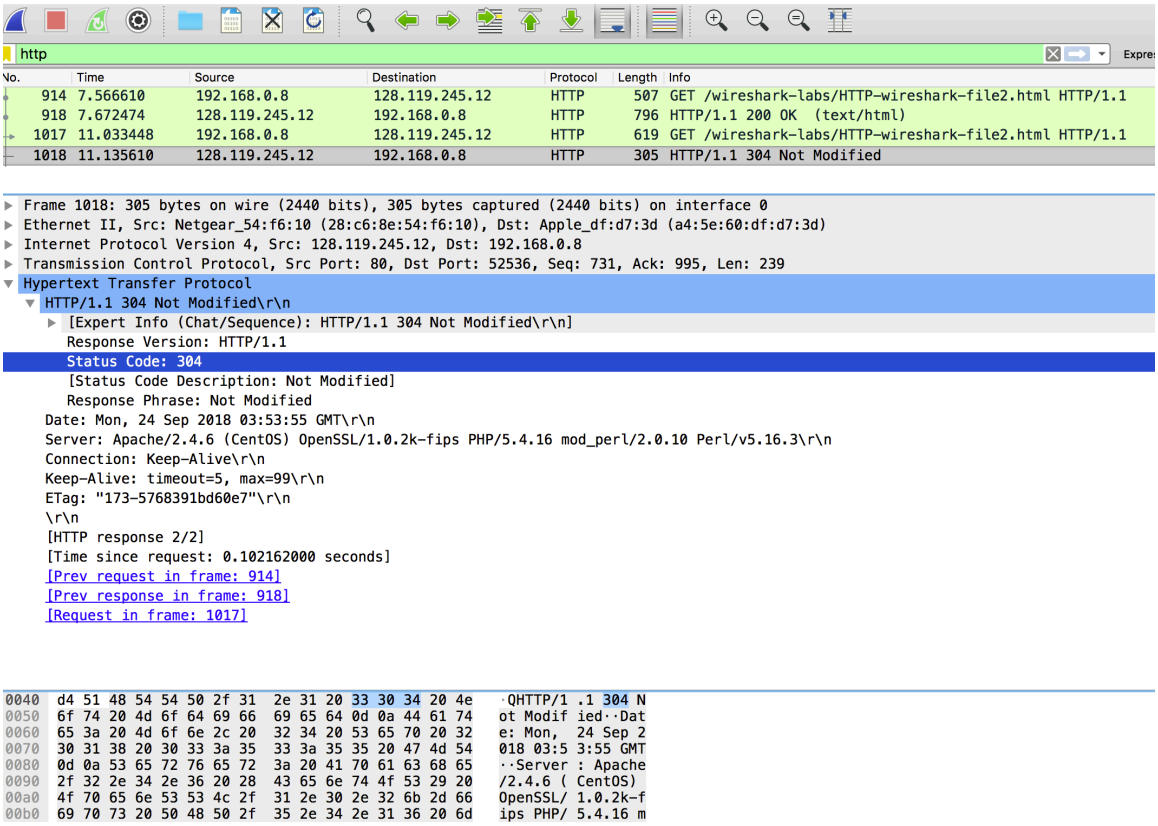
a) There is no IF-MODIFIED-SINCE header in the first request. (in first screenshot). The content is explicitly returned by the server in the first response as shown by the line-based text data in the response. (in second screenshot)





b) There is an IF-MODIFIED-SINCE header in the first request. It contains "Sun, 23 Sep 2018 05:59:01 GMT\r\n" (in first screenshot). The server responds with Status Code 304: Not Modified (in second screenshot and line below selection). This is because there has been no change to the data since the last request not long ago. There is no need to respond with all of the data.

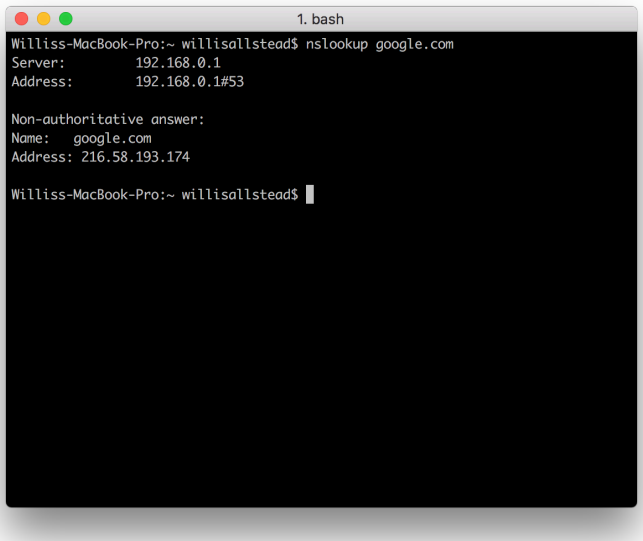




Part 4

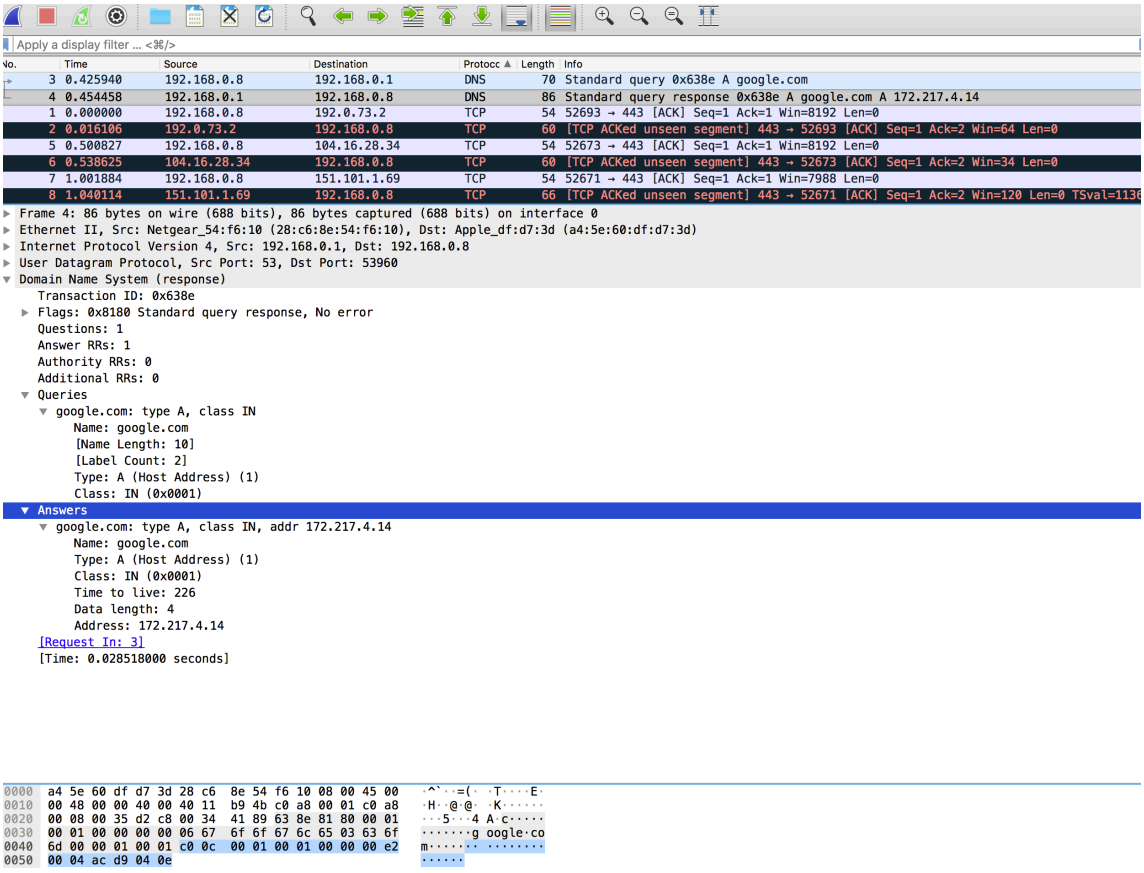
4.

a) The IP Addresses given was: 216.58.193.174. This was achieved with command: `nslookup google.com`.

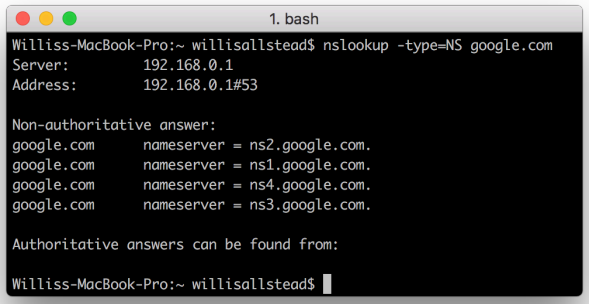


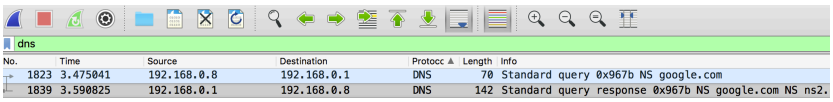
b) As you can see above, there was no server obviously designated as the one giving the answer. But, you can see that it is a non-authoritative answer. It seems like 192.168.0.1 is the server giving the response.

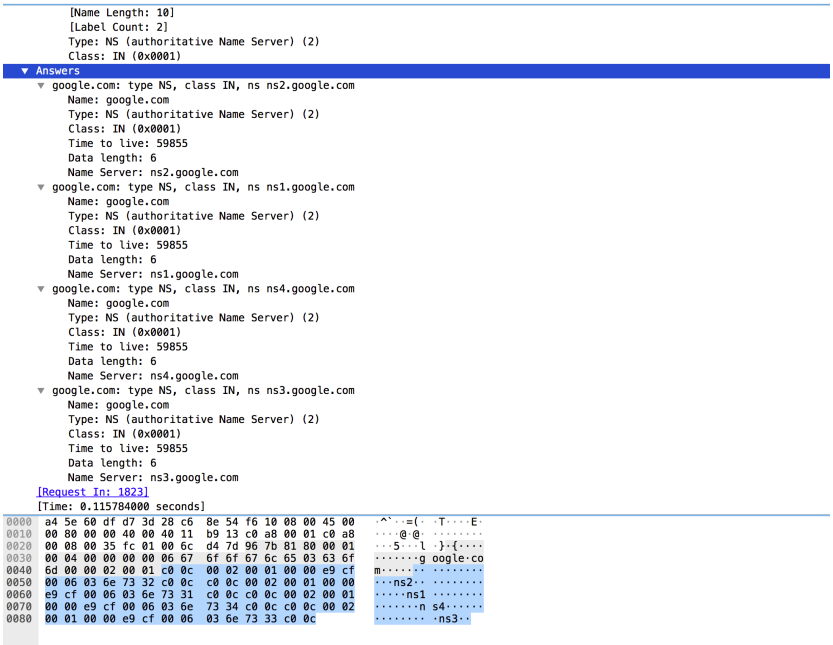
c) I found that the response in wireshark listed the A-record (as was expected by not specifying the type), a TTL of 226, and an address of 172.217.4.14 (which was the address of the server it was pointing to this time).



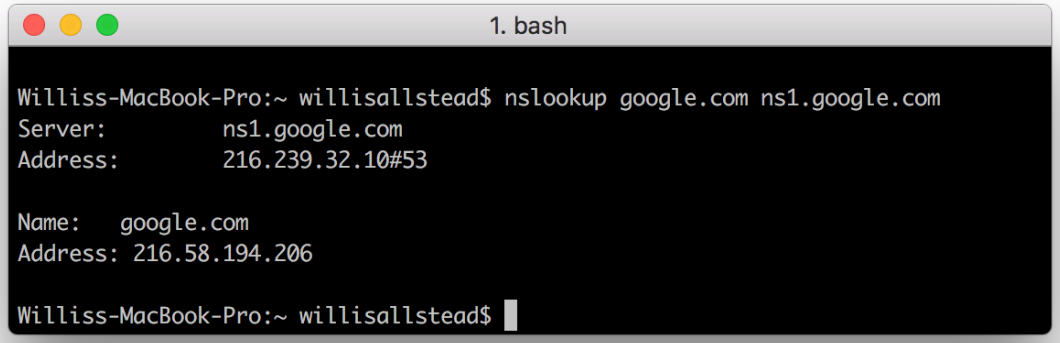
d) I ran the command shown in the screenshot below and got the following results. In wireshark I received 4 answers of type NS for my query if google.com. Each contained a name server, like ns1.google.com, ns2.google.com, etc.

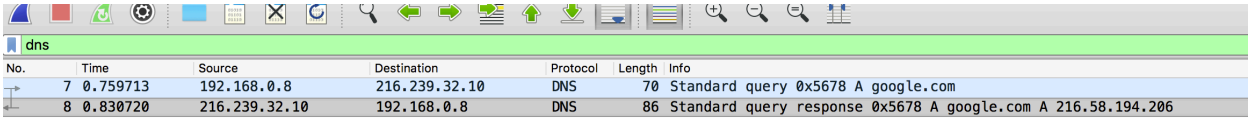






e) I ran the command shown in the screenshot below using ns1.google.com instead of the default nameserver. You can see that in the wireshark response the answer was of type A but there was no mention in either nslookup or wireshark of the response being non-authoritative.






```
▶ Frame 8: 86 bytes on wire (688 bits), 86 bytes captured (688 bits) on interface 0
▶ Ethernet II, Src: Netgear_54:f6:10 (28:c6:8e:54:f6:10), Dst: Apple_df:d7:3d (a4:5e:60:df:d7:3d)
▶ Internet Protocol Version 4, Src: 216.239.32.10, Dst: 192.168.0.8
▶ User Datagram Protocol, Src Port: 53, Dst Port: 53869
▼ Domain Name System (response)
    Transaction ID: 0x5678
  ▶ Flags: 0x8500 Standard query response, No error
    Questions: 1
    Answer RRs: 1
    Authority RRs: 0
    Additional RRs: 0
  ▼ Queries
    ▼ google.com: type A, class IN
        Name: google.com
        [Name Length: 10]
        [Label Count: 2]
        Type: A (Host Address) (1)
        Class: IN (0x0001)
  ▼ Answers
    ▼ google.com: type A, class IN, addr 216.58.194.206
        Name: google.com
        Type: A (Host Address) (1)
        Class: IN (0x0001)
        Time to live: 300
        Data length: 4
        Address: 216.58.194.206
    [Request In: 7]
    [Time: 0.071007000 seconds]
```

```
0000  a4 5e 60 df d7 3d 28 c6  8e 54 f6 10 08 00 45 00   ·^`··=(· ·T····E·
0010  00 48 a2 af 00 00 66 11  f8 4b d8 ef 20 0a c0 a8   ·H····f· ·K·· ···
0020  00 08 00 35 d2 6d 00 34  28 be 56 78 85 00 00 01   ···5·m·4 (·Vx····
0030  00 01 00 00 00 00 06 67  6f 6f 67 6c 65 03 63 6f   ·······g oogle·co
0040  6d 00 00 01 00 01 c0 0c  00 01 00 01 00 00 01 2c   m······· ·······,
0050  00 04 d8 3a c2 ce                                 ···:··
```