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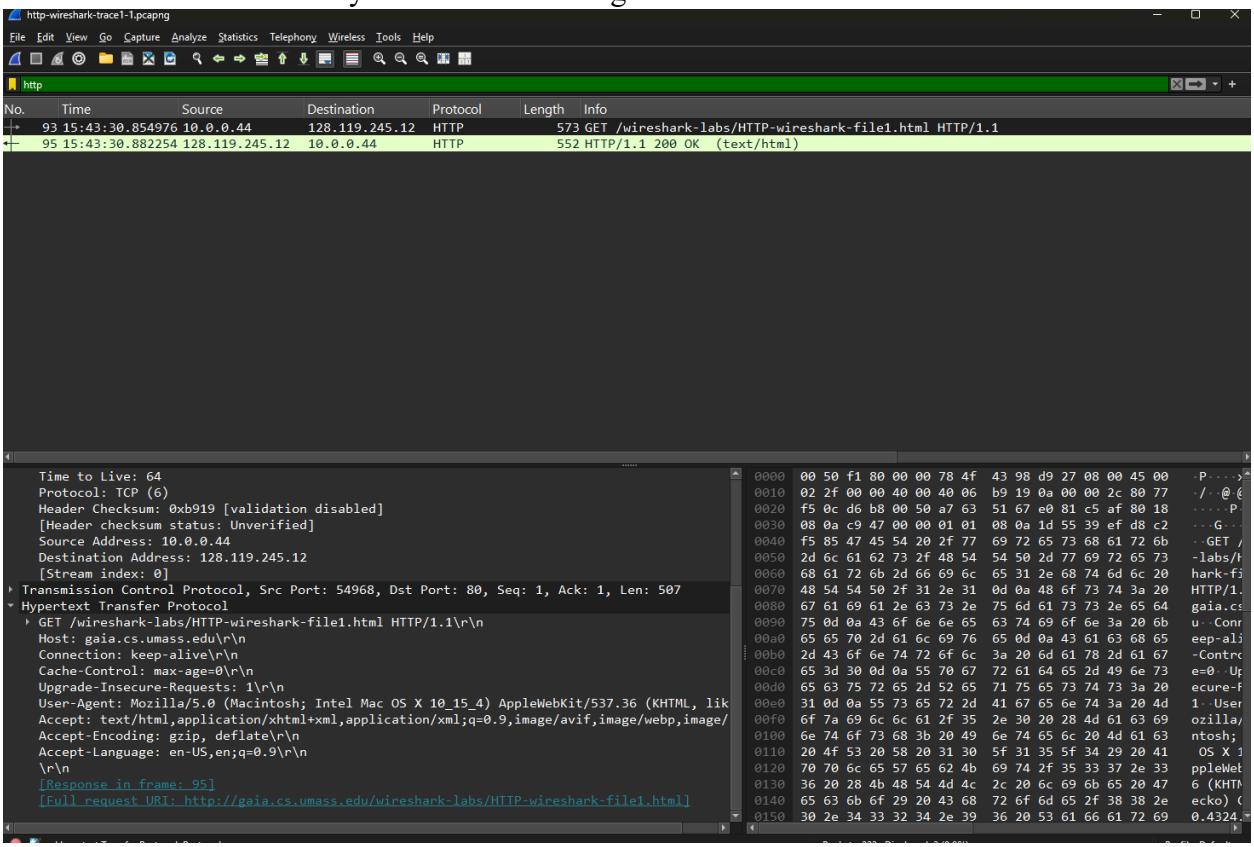
COMP 4320: Midterm 1

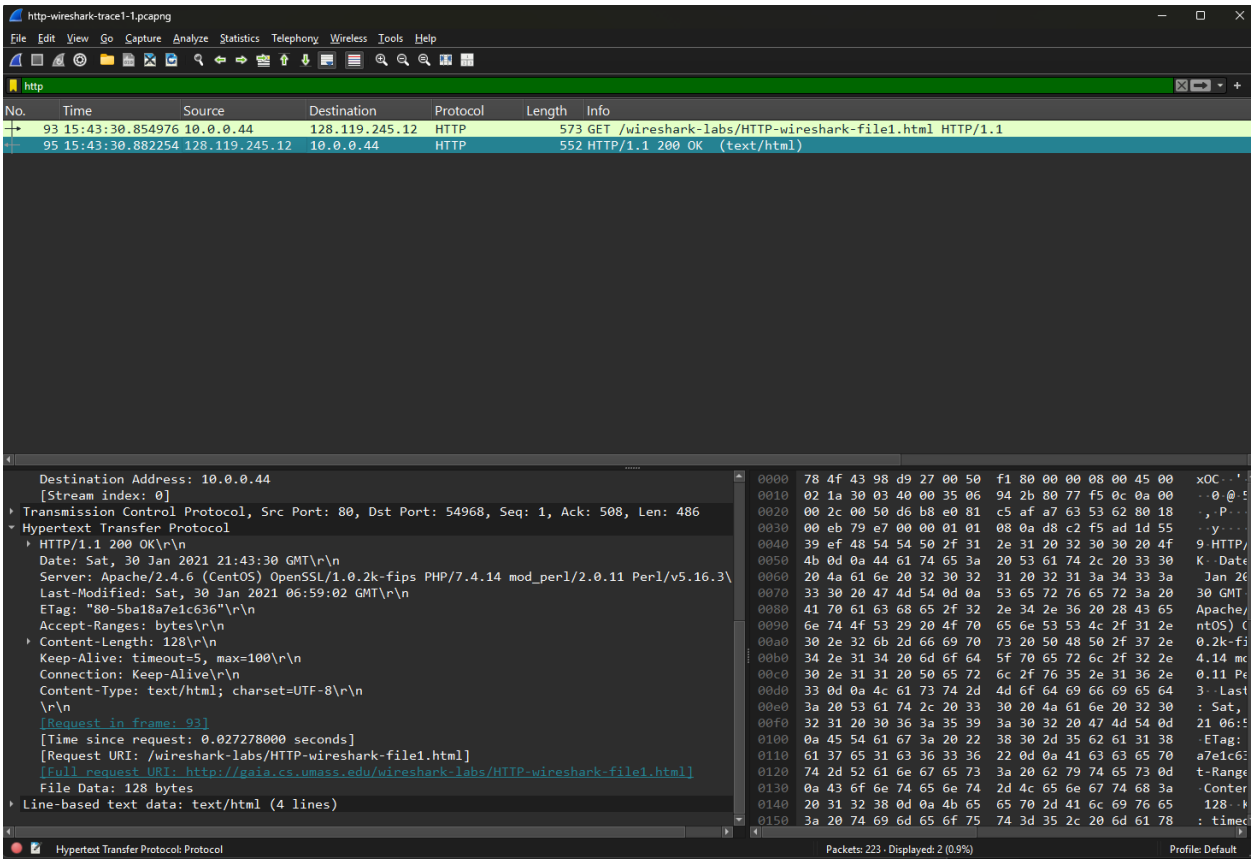
Question 1

1. Which version of HTTP is your browser running?



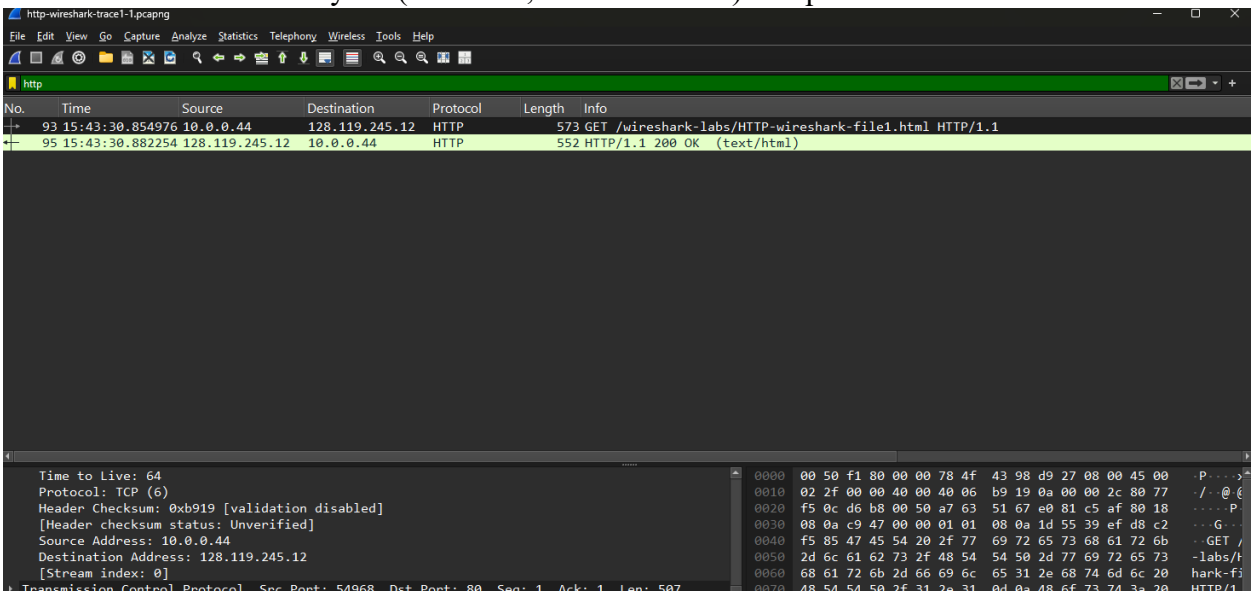
It is running 1.1 as you can see in the get message.

2. Which version of HTT is running at the server?



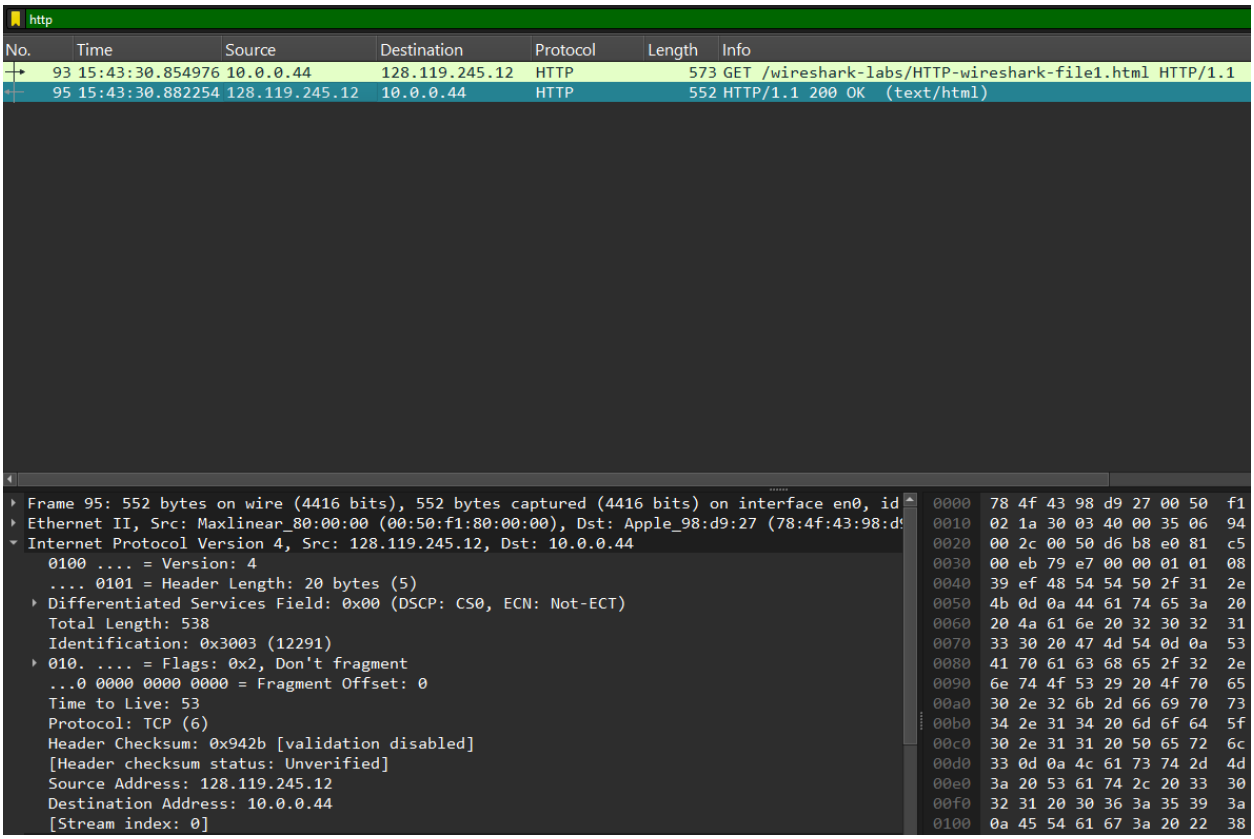
It is running 1.1 at the server as well.

3. What is the IP address of your (the client, with a browser) computer?



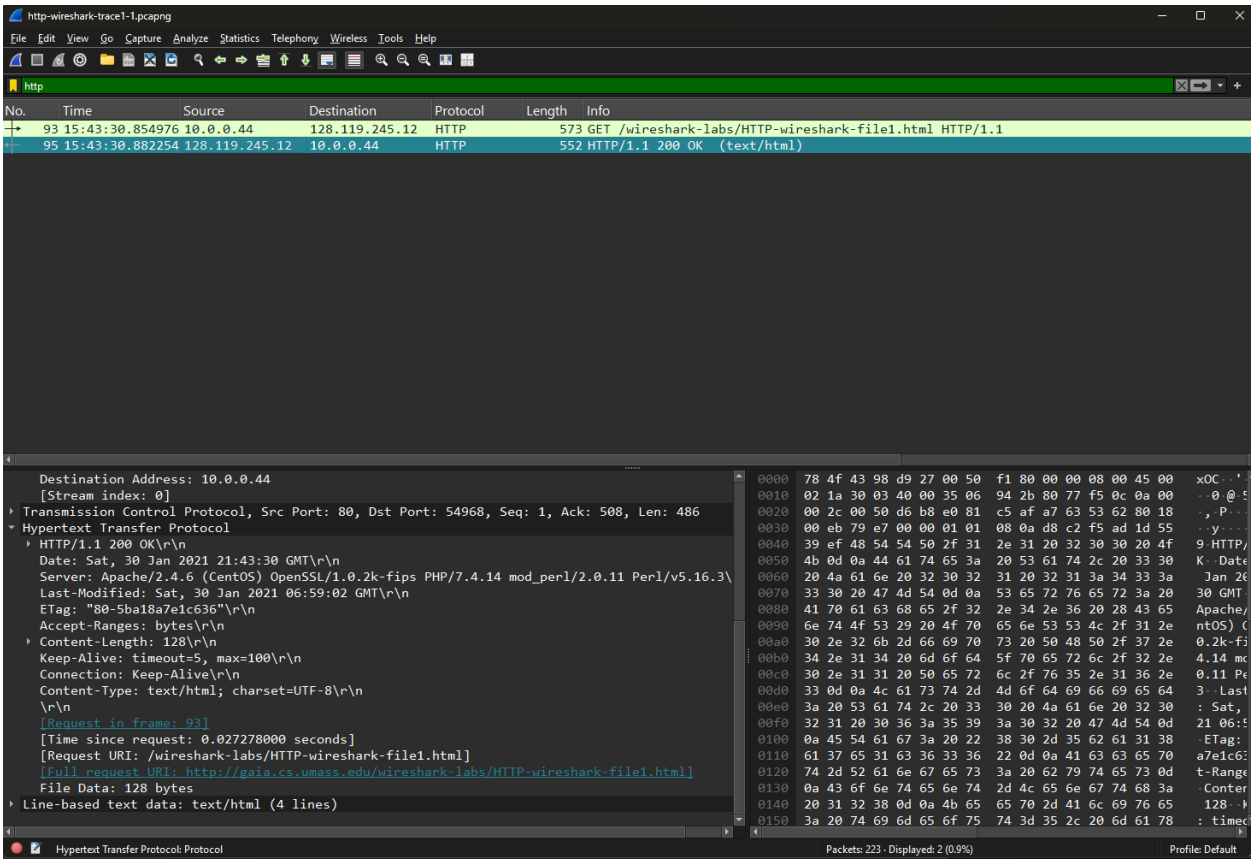
The IP address of the client is 10.0.0.44 because it is the source in this.

4. What is the HTTP server that replied to your HTTP GET request?



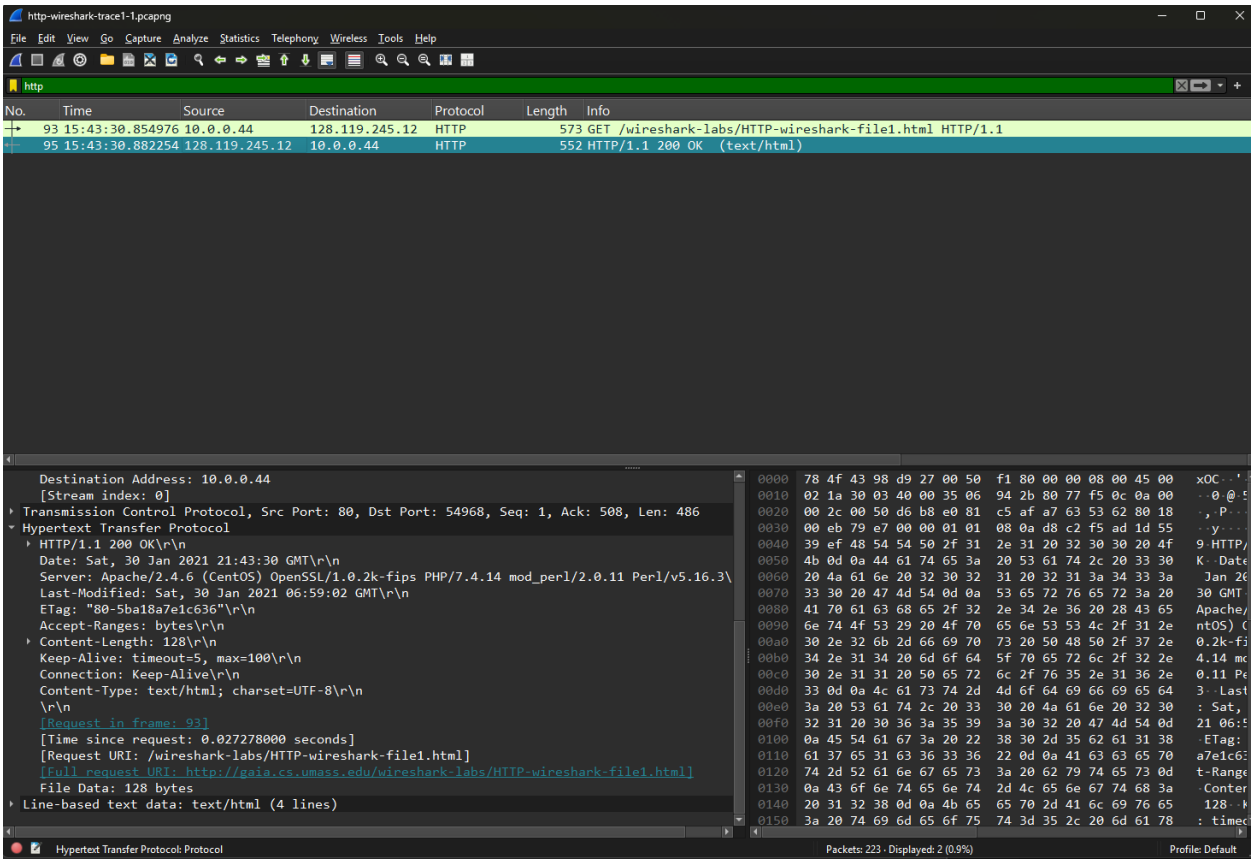
The IP address of the server is 128.119.245.12 because it is sending the response from the HTTP GET request.

5. What is the status code returned from the server to your browser in response to the original HTTP GET?



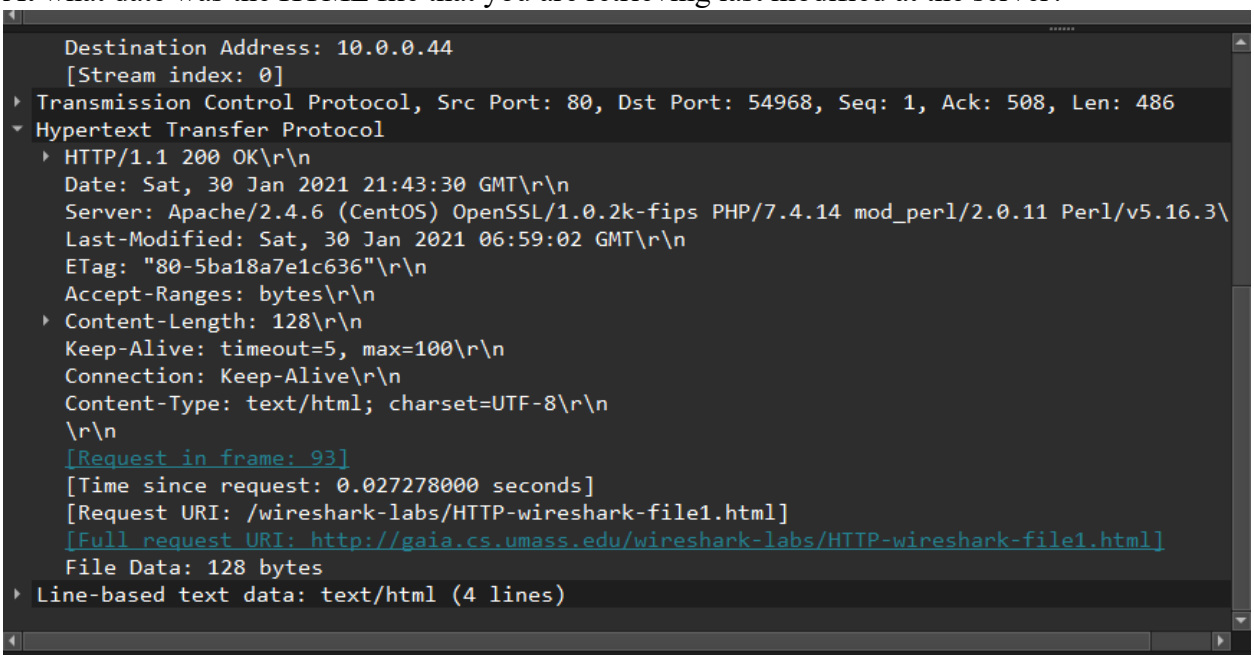
The status code of the response is 200.

6. What is the status phrase returned from the server to your browser in response to the original HTTP GET?



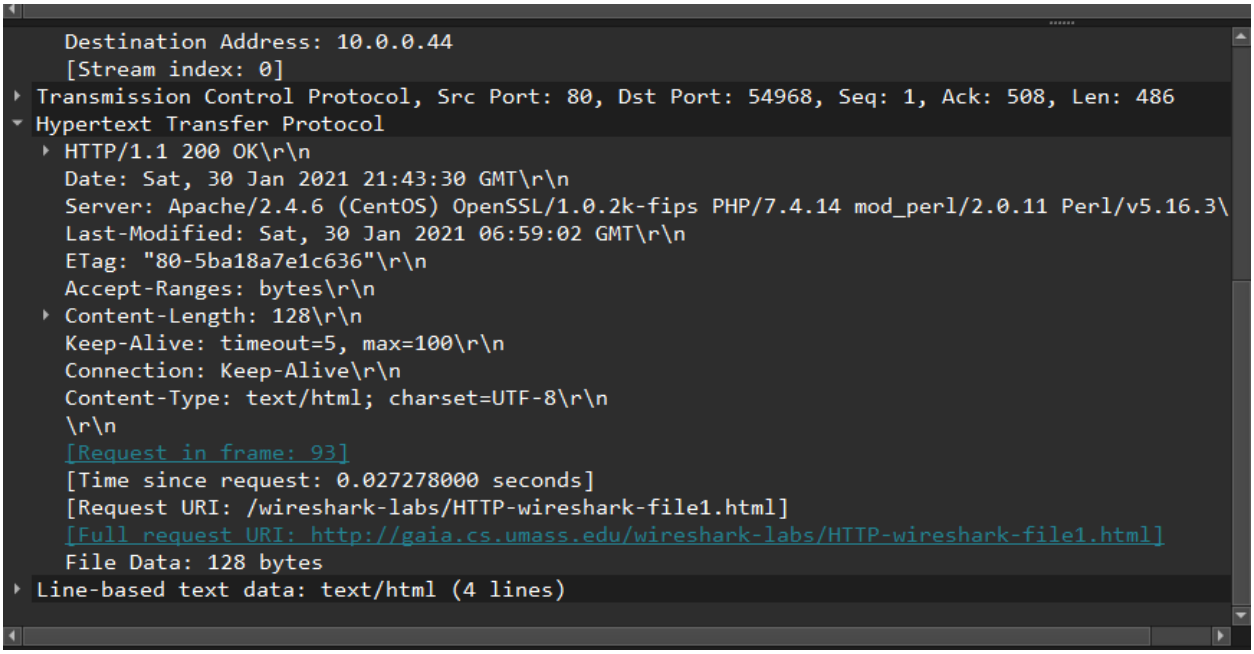
The phrase return is OK.

7. At what date was the HTML file that you are retrieving last modified at the server?



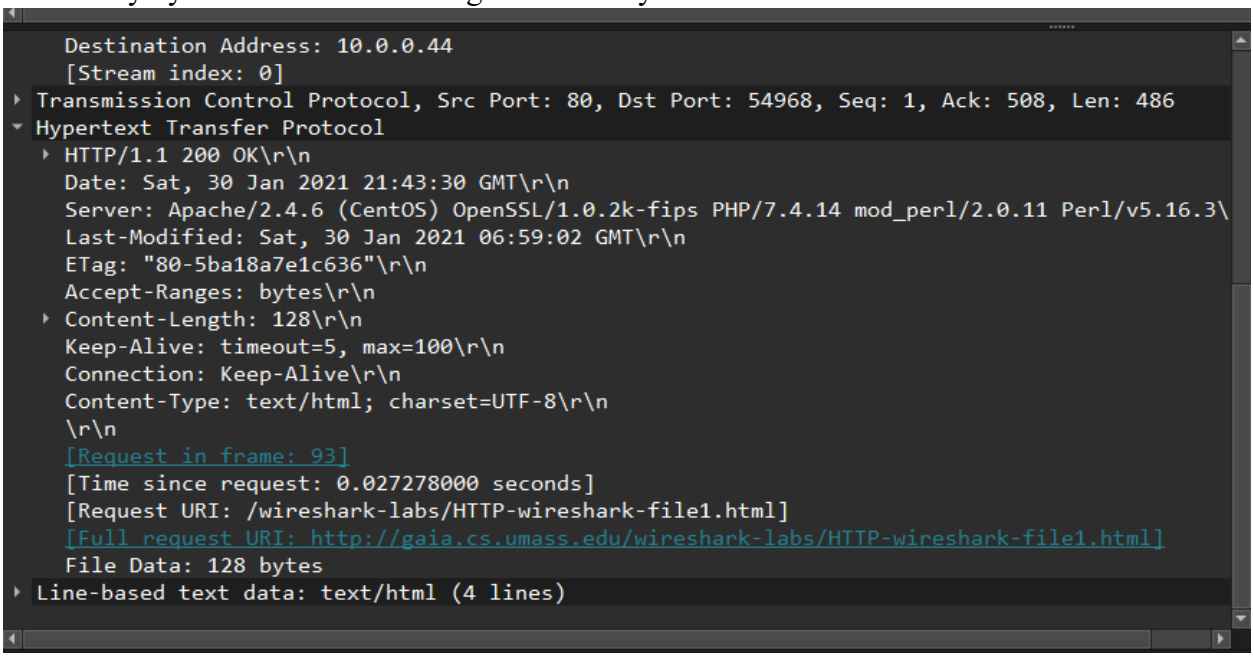
01/30/2021

8. At what time was the HTML file that you are retrieving last modified at the server?



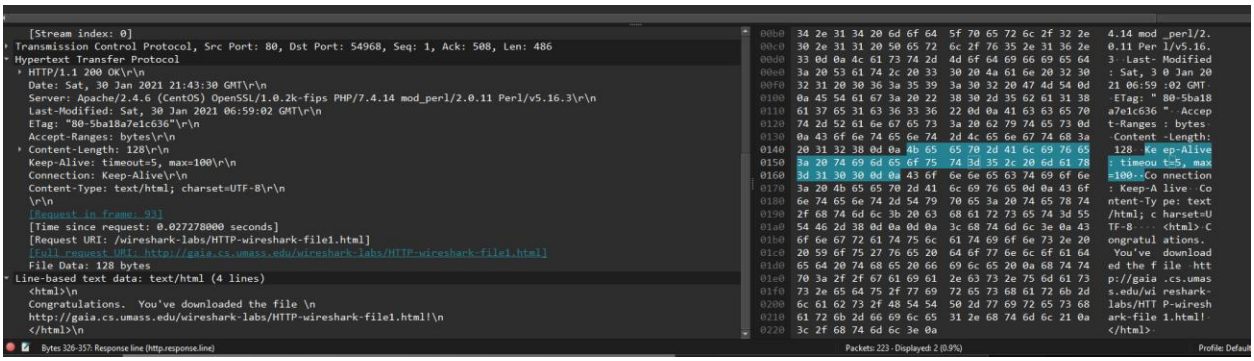
21:43:30

9. How many bytes of content are being returned to your browser?



128 bytes are being returned to your browser.

10. By inspecting the raw data in the packet content window, do you see any headers within the data that are not displayed in the packet-listing window? (Yes/No)



No

Question 3

3.

1. [redacted] $80 > 60 = 60$ Mbps

2. $R_s = 80$ Mbps

$R_{bottleneck}/R_s = 60/80 = 3/4 = 75\%$

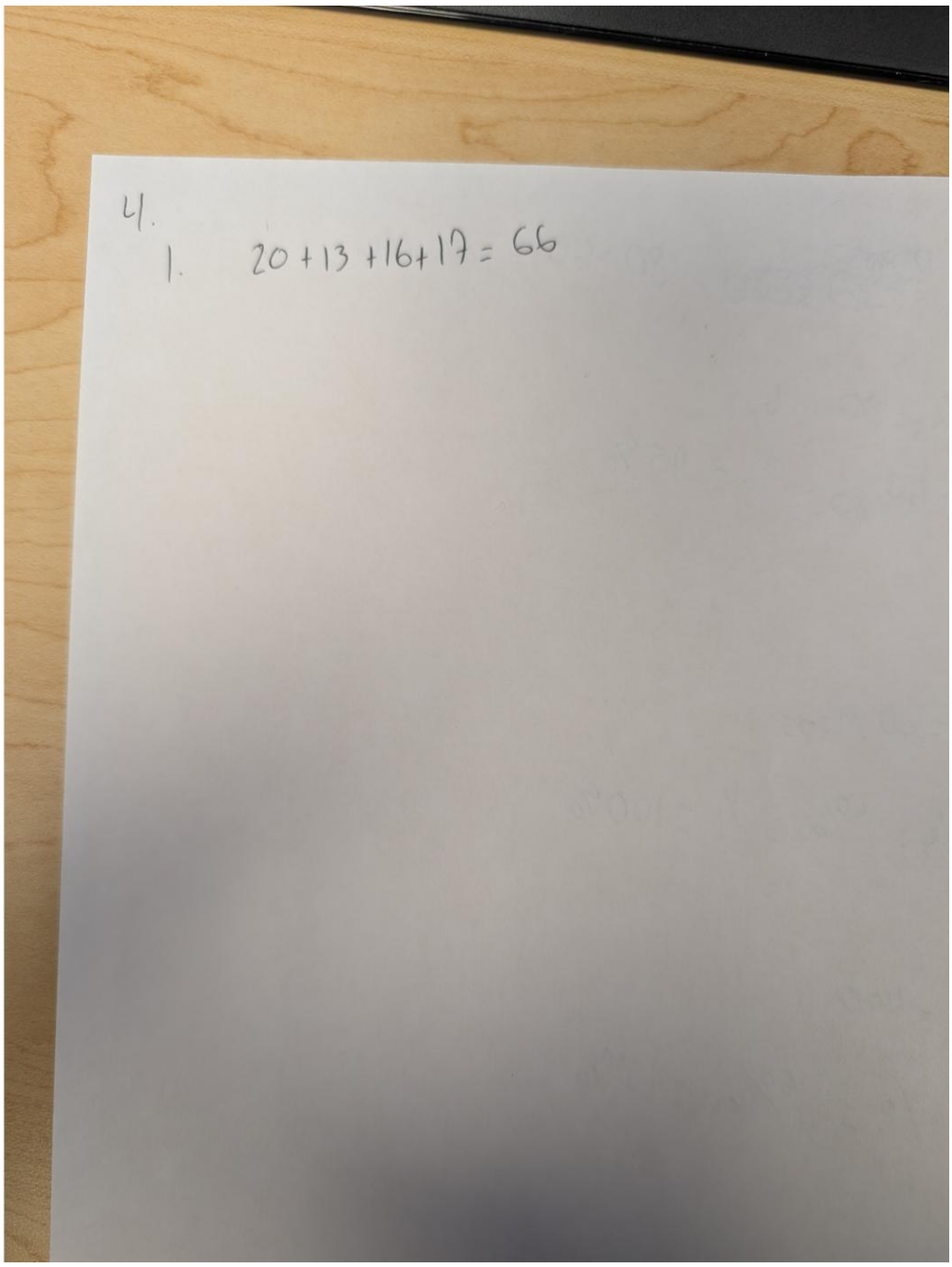
3. $R_c = 60$ Mbps

$R_{bottleneck}/R_c = 60/60 = 1/1 = 100\%$

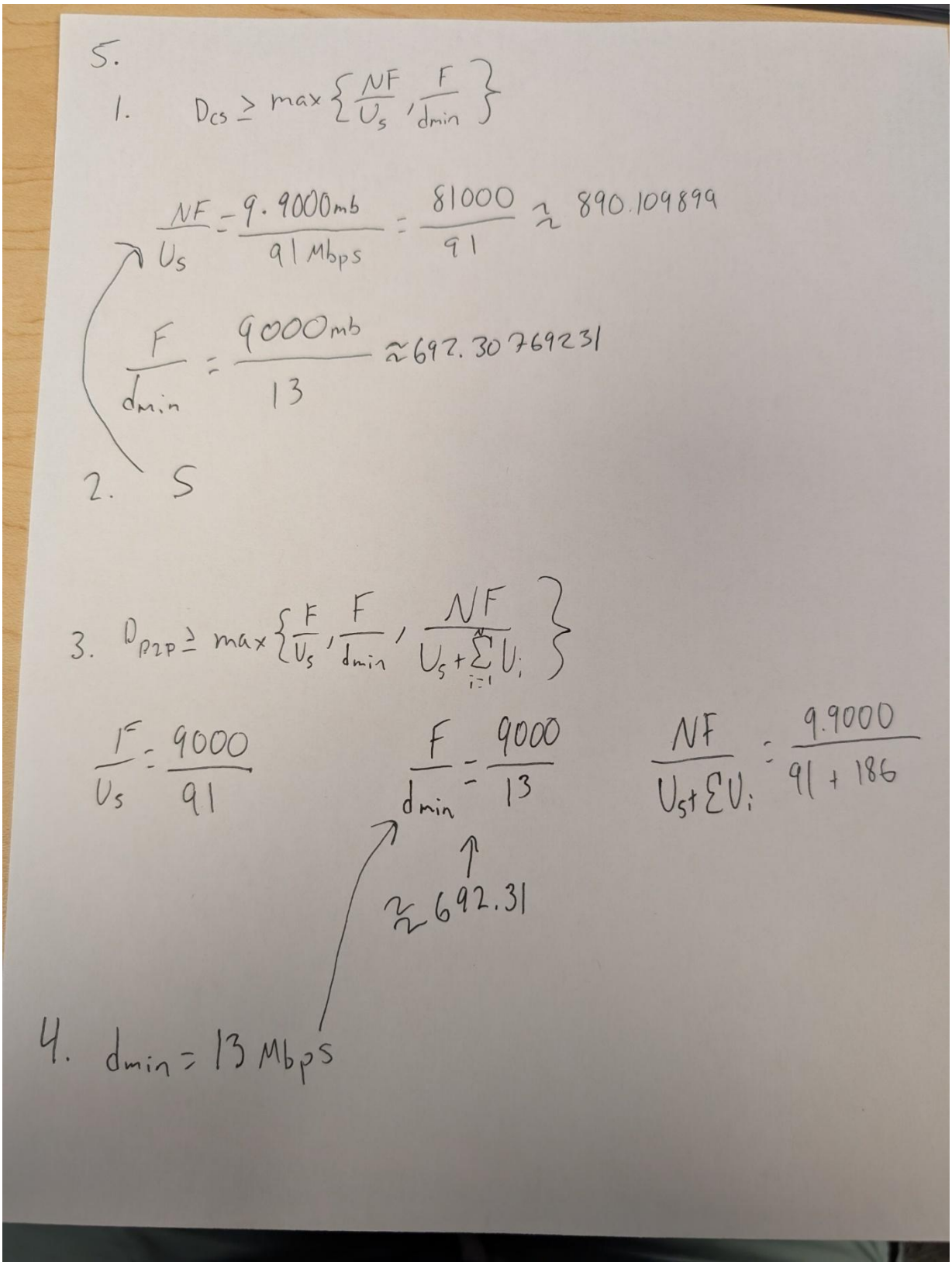
4. $R = 400$

$R_{bottleneck}/R = 60/400 = 15\%$

Question 4



Question 5


5.
1. $D_{CS} \geq \max\left\{\frac{NF}{U_s}, \frac{F}{d_{min}}\right\}$
$\frac{NF}{U_s} = \frac{9.9000mb}{91Mbps} = \frac{81000}{91} \approx 890.109899$
$\frac{F}{d_{min}} = \frac{9000mb}{13} \approx 692.30769231$
2. S
3. $D_{P2P} \geq \max\left\{\frac{F}{U_s}, \frac{F}{d_{min}}, \frac{NF}{U_s + \sum_{i=1}^{n} U_i}\right\}$
$\frac{F}{U_s} = \frac{9000}{91}$
$\frac{F}{d_{min}} = \frac{9000}{13}$
$\frac{NF}{U_s + \Sigma U_i} = \frac{9.9000}{91 + 186}$
≈ 692.31
4. $d_{min} = 13$ Mbps

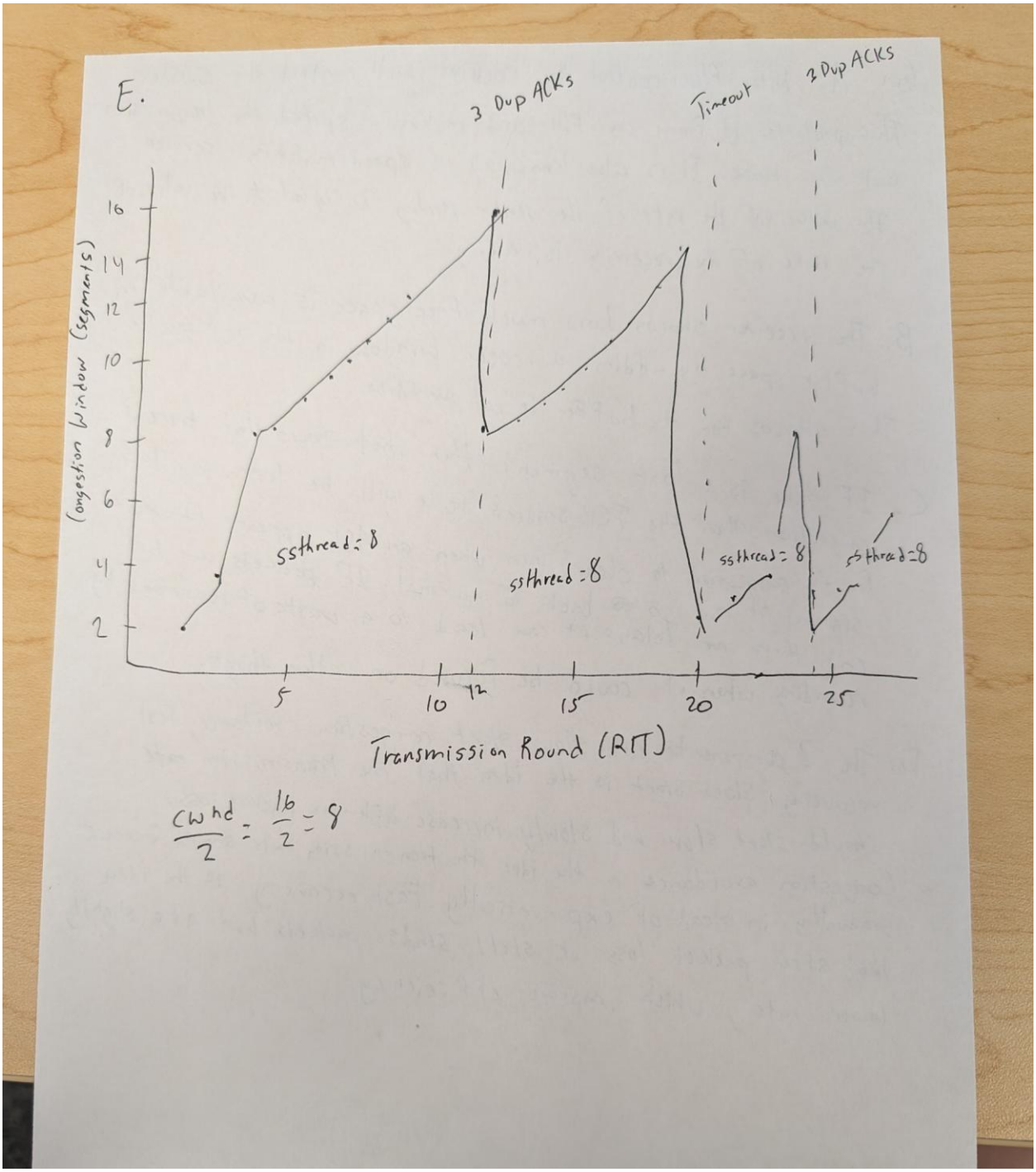
Question 6

6. A. With flow control the reciver will control the sender. This protects it from overflow and makes it spread the transmission out over time. It is also know as a speed-matching service. The value of the rate of the sender sending is equal to the value of the rate of the receiving is reading.

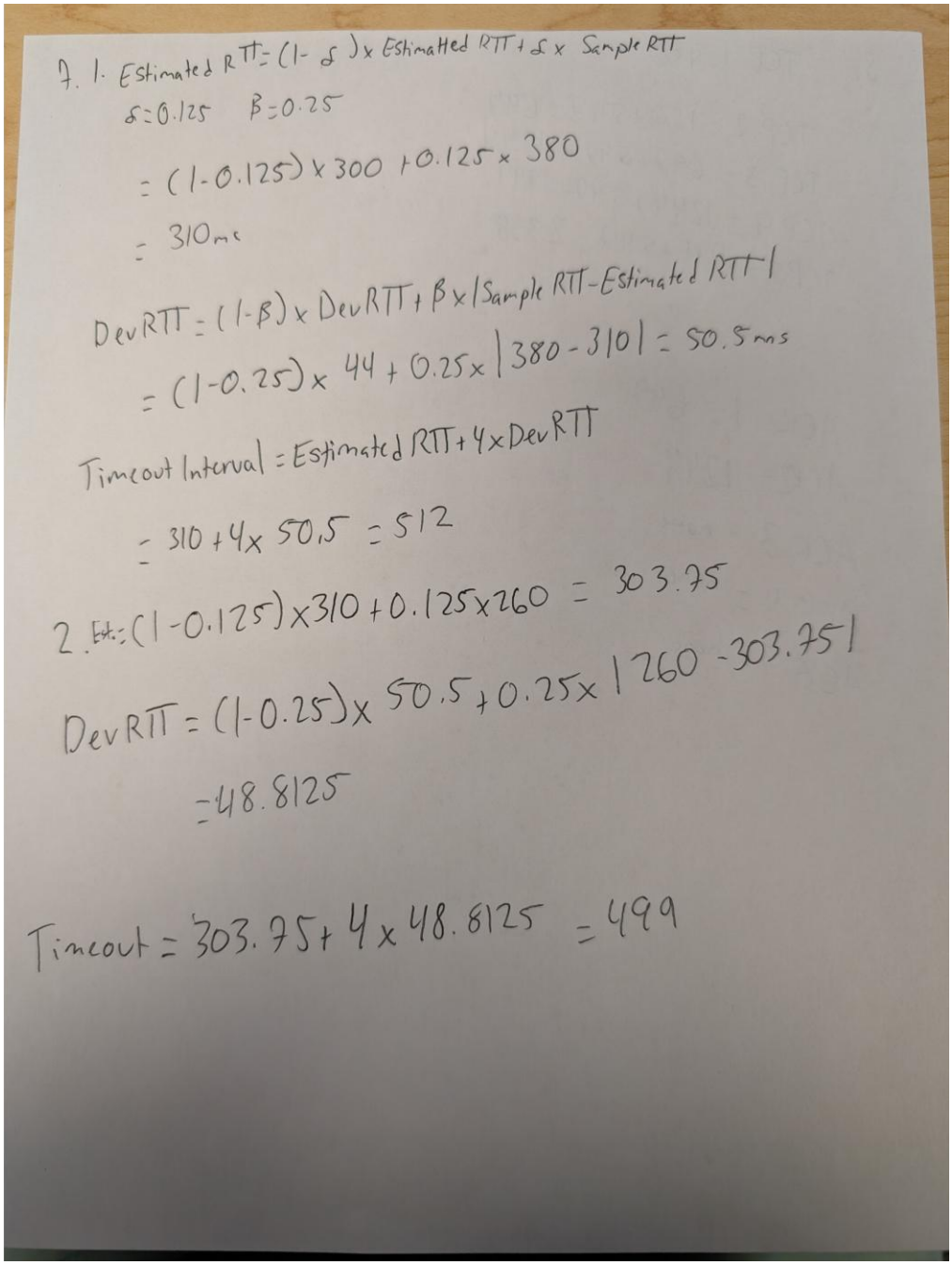
B. The receiver shows how much free space is available in buffer space by adding a receiv window in the TCP header. This allows for the buffer to not overflow.

C. IF there is a lost segment then that shows that there is congestion. Then the TCP sender's rate will be lessen to allow for the congestion to clear. Then when an ACK appears for that segment it can go back to normal. If packets are lost and there are delays it can lead to a waste of resources by resending when it could be focused on other things.

D. The 3 components are slow start, congestion avoidance, fast recovery. Slow start is the idea that the transmission rate should start slow and slowly increase after no packet loss. Congestion avoidance is the idea th transmission rate should increase gradually instead of exponentially. Fast recovery is the idea that after packet loss it still sends packets but at a slightly lower rate, which improve efficiency.


E.
3 Dup ACKs
Timeout
3 Dup ACKs
(congestion window (segments)
16
14
12
10
8
6
4
2
ssthread = 8
ssthread = 8
ssthread = 8
ssthread = 8
5
10
12
15
20
25
Transmission Round (RTT)
cwnd / 2 = 16 / 2 = 8

Question 7


7. 1. Estimated RTT = (1- δ) x Estimated RTT + δ x Sample RTT
δ=0.125 β=0.25
= (1-0.125) x 300 +0.125 x 380
= 310ms
DevRTT = (1-β) x DevRTT + β x |Sample RTT-Estimated RTT|
= (1-0.25) x 44 + 0.25 x |380 - 310| = 50.5ms
Timeout Interval = Estimated RTT + 4 x DevRTT
= 310 + 4 x 50.5 = 512
2. Est.: (1-0.125) x 310 + 0.125 x 260 = 303.75
DevRTT = (1-0.25) x 50.5 + 0.25 x |260 - 303.75|
= 48.8125
Timeout = 303.75 + 4 x 48.8125 = 499

Question 8

8. TCP 1 = 150

TCP 2 = 150 + 547 = 697
TCP 3 = 697 + 547 = 1244
TCP 4 = 1244 + 547 = 1791
TCP 5 = 1791 + 547 = 2338

ACK 1 = 697
ACK 2 = 1244
ACK 3 = none
ACK 4 = none
ACK 5 = none