Assignment 3

Due 16 Nov at 22:59 **Points** 15 **Questions** 15 **Time limit** None

Instructions

While working on this assignment, you certify that you have neither given help to nor received help from any other person.

Attempt history

	Attempt	Time	Score
LATEST	Attempt 1	206 minutes	13 out of 15

Submission details:

Time:	206 minutes
Current score:	13 out of 15
Kept score:	13 out of 15

ⓘ Correct answers are hidden.

Score for this quiz: **13** out of 15
Submitted 16 Nov at 20:24
This attempt took 206 minutes.

Question 1 **1 / 1 pts**

Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP?

- ◉ UDP since it requires 1 RTT
- ○ TCP because it requires 2 RTT

Question 2 **1 / 1 pts**

An application developer may not want his/her application to use TCP's congestion control, which can throttle the application's sending rate at times of congestion. Often, designers of IP telephony and IP videoconference applications choose to run their applications over UDP because they want to avoid TCP's congestion control.

- ◉ True
- ○ False

Question 3 **1 / 1 pts**

An attacker can use the whois database and nslookup tool to determine the IP address ranges, DNS server addresses, etc., for the target institution, By analyzing the source address of attack packets, the victim can use whois to obtain information about domain from which the attack is coming and possibly inform the administrators of the origin domain.

- ◉ True
- ○ False

Question 4 **1 / 1 pts**

Consider distributing a file F = 15 Gbits to 10 peers. The server has an upload rate of us=30 Mbps, and each peer has a download rate of di=2

Mbps and an upload rate of u=300 Kbps, which of the following options give the minimum distribution time for client-server distribution?

- (●) 7680
- ( ) 25904
- ( ) 512000

Question 5

1 / 1 pts

Consider distributing a file F = 15 Gbits to 100 peers. The server has an upload rate of us=30 Mbps, and each peer has a download rate of di=2 Mbps and an upload rate of u=300 Kbps, which of the following options give the minimum distribution time for P2P distribution?

- ( ) 7680
- (●) 25904
- ( ) 512000

Question 6

1 / 1 pts

Web caching brings the desired content “closer” to the user, possibly to the same LAN to which the user’s host is connected. Therefore, web caching can reduce the delay for all objects, even objects that are not cached, since caching reduces the traffic on links.

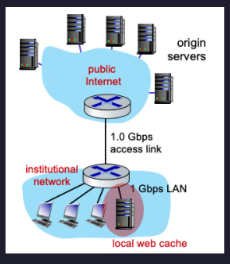
- (●) True
- ( ) False

Question 7

1 / 1 pts

Consider an HTTP 1.1 client and server. The RTT delay between the client and server is 2 seconds. Suppose the time a server needs to transmit an object into its outgoing link is 3 seconds.

There is also a local web cache, as shown in the figure below, with negligible (zero) propagation delay and object transmission time. The client makes 100 requests one after the other, waiting for a reply before sending the next request. All requests first go to the cache (which also has a 2.0 sec. RTT delay to the server but zero RTT to the client).



How much time elapses between the client transmitting the first request, and the receipt of the last requested object, *assuming no use of the IF-MODIFIED-SINCE header line anywhere, and assuming that 50% of the objects requested are "hits"* (found) in the local cache?

- ( ) 203 secs
- (●) 252 secs

Nice! Your answer is correct.

352 secs

350 secs

150 secs

Nice! Your answer is correct.

Question 8

1 / 1 pts

What is the value of caching in the local DNS name server? Check all that apply.

- [x] DNS caching provides for faster replies, if the reply to the query is found in the cache.
- [x] DNS caching results in less load elsewhere in DNS, when the reply to a query is found in the local cache.
- [ ] DNS caching provides prioritized access to the root servers, since the DNS request is from a local DNS cache.
- [ ] DNS caching provides the ability to serve as authoritative name server for multiple organizations.

Nice! This answer is correct

Question 9

1 / 1 pts

What approach is taken by a CDN to stream content to hundreds of thousands of simultaneous users?

- Serve video from a single central "mega-server" with ultra-high-speed network connectivity, and high-speed storage.
- (•) Store/serve multiple copies of videos at multiple geographically distributed sites.

Nice! Your answer is correct.

- Proactively push videos to a client device before they're requested, using machine learning to predict requested videos.
- Allow client devices to send requested content to each other, in order to offload the CDN infrastructure.

Nice! Your answer is correct.

Question 10

1 / 1 pts

In DASH (Dynamic, Adaptive Streaming over HTTP), a server divides a video file into chunks that ... (pick best completion from below)

- (selected) ... are stored, each encoded at multiple rates (video quality). The client plays the video chunk-by-chunk, with each chunk requested at encoding rate that fits the available bandwidth at the time.

  Nice. Your answer is correct.

- ... are download smallest-chunk-first in order to maximize the number of chunks received.
- ... are stored, each encoded at multiple rates (video quality). The client receives multiple video chunks (encoded at different rates) and plays out the chunks that best fit the screen size.
- ... are downloaded just before their playout time. Chunking is used primarily because a viewer may jump around (e.g., fast forward) in a video.
- ... allow premium users to avoid watching chunks that contain commercials.

Nice. Your answer is correct.

Question 11

1 / 1 pts

Consider the two sixteen bit numbers:

```
10110100 01000110
01001000 01101111
```

Compute the Internet Checksum of these two values

Enter the 2 bytes each as an 8-bit number with only 0's and 1's, and make a single blank space between the two 8-bit numbers (e.g., 01010101 00101000).

00000011 010010

Answer 1:

00000011 01001010

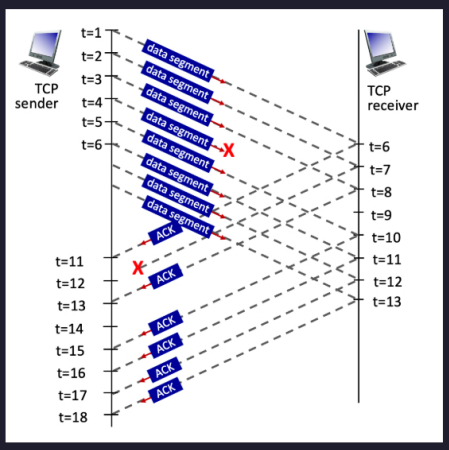
Nice! This answer is correct!

Question 12

1 / 1 pts

Consider the figure below, where a TCP sender sends 8 TCP segments at *t = 1, 2, 3, 4, 5, 6, 7, 8*. Suppose the initial value of the sequence number is 0 and every segment sent to the receiver each contains 100 bytes. The delay between the sender and receiver is 5 time units, and so the first segment arrives at the receiver at t = 6. The ACKs sent by the receiver at *t = 6, 7, 8, 10, 11, 12* are shown. The TCP segments (if any) sent by the sender at t = 11, 13, 15, 16, 17, 18 are *not* shown.

The segment sent at t=4 is lost, as is the ACK segment sent at t=7.



What is the sequence number of the segment sent at t=2?

- 200
- 100 (selected)

Nice. This answer is correct.

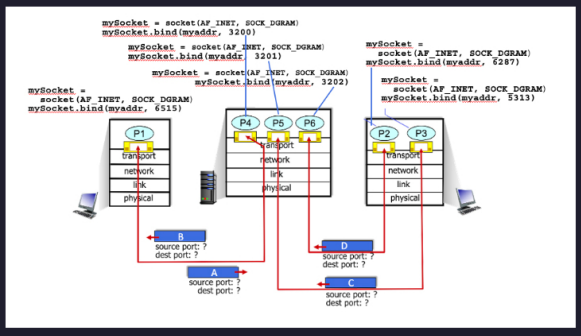
- 1
- 2

Nice. This answer is correct.

Question 13

1 / 1 pts

Consider the figure below, with 6 sockets shown across the network and the corresponding Python code at each host. There are four UDP segments in flight. Which of the following are the values of the destination port numbers for segments A, B, C, and D, respectively?



Note: you can generate/solve/practice many similar instances of this question here.

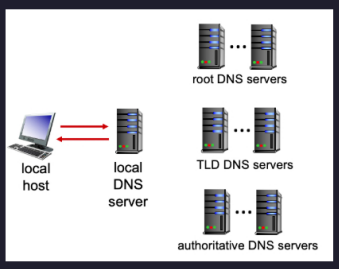
- 3200, 6515, 3201, and 3202 (selected)
- 6515, 3200, 5313, and 6287
- 3200, 6515, 5313, and 62875
- 6515, 3200, 6287, and 5313

Unanswered

Question 14

0 / 1 pts

Suppose the local DNS server caches all information coming in from all root, TLD, and authoritative DNS servers for 20 time units. (Thus, for example, when a root server returns the name and address of a TLD server for .com, the cache remembers that this is the TLD server to use to resolve a .com name). Assume also that the local cache is initially empty, that iterative DNS queries are always used, that DNS requests are just for name-to-IP-address translation, and that 1-time unit is needed for each server-to-server or host-to-server (one-way) request/response, and that there is only one authoritative name server (each) for any .edu or .com domain.



Consider the following DNS requests made by the local host at the given times:

- *t=0*, the local host requests that the name gaia.cs.umass.edu be resolved to an IP address.
- *t=1*, the local host requests that the name icann.org be resolved to an IP address.
- *t=5*, the local host requests that the name cs.umd.edu be resolved to an IP address. (Hint: be careful!)
- *t=10*, the local host *again* requests that the name gaia.cs.umass.edu be resolved to an IP address.
- *t=12*, the local host requests that the name cs.mit.edu be resolved to an IP address.
- *t=30*, the local host *again* requests that the name gaia.cs.umass.edu be resolved to an IP address. (Hint: be careful!)

Which of the requests requires 8 time units to be resolved?

- ☐ The request at *t=0*.
- ☐ The request at *t=1*.
- ☐ The request at *t=5*.
- ☐ The request at *t=10*.
- ☐ The request at *t=12*.
- ☐ The request at *t=30*.

Not quite. This answer is incorrect.

Incorrect

Question 15

0 / 1 pts

Which of the following characteristics apply to both HTTP and SMTP? Note: check one or more of the characteristics below.

- ☑ Has ASCII command/response interaction, status codes.
- ☐ Operates mostly as a "client push" protocol.
- ☐ Operates mostly as a "client pull" protocol.
- ☐ Is able to use a persistent TCP connection to transfer multiple objects.
- ☑ Uses CRLF.CRLF to indicate end of message.
- ☐ Uses a blank line (CRLF) to indicate end of request header.

Not quite. This answer is incorrect.

Quiz score: **13** out of 15

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