Matthew Irvine

1001401200

Chapter 2 review

Section 2.1  
R5. What information is used by a process running on one host to identify a process running on another host? (2 marks)

IP address (to get to the host), and port number specifically identifies the process on the host.

Section 2.2 – 2.5

R11.  Why do HTTP, FTP, SMTP, and POP3 run on top of TCP rather than on UDP? (1 mark)

Due to the type of content used in these protocols it is important that they use a reliable connection to be sure that all the information is transferred correctly.

R12.  Consider an e-commerce site that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies. (1 mark)

Give the client a unique cookie ID that is used in a database. Store purchase history in database using the cookie ID as a key. When user returns cookie ID is used to retrieve purchase history.

R13.  Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why? (1 mark)

By Web caching when a client makes a request that has been cached the server doesn’t have to generate a response, the proxy server returns the cached response that had already been generated previously thereby reducing the delay. Not all objects requested will have reduced delay because cache doesn’t hold every object forever or sometimes the object is updated on the server. Either case the client will have to wait for the server to respond to the proxy server instead of just getting the cached response.

R19. Is it possible for an organization’s Web server and mail server to have exactly the same alias for a hostname (for example, foo.com)? What would be the type for RR that contains the hostname of the mail server? (1 mark)

Yes, typing is used to differentiate ‘name’ and ‘value’ meanings. Type A means ‘name’ is hostname and ‘value’ is IP address while type MX has ‘value’ meaning the name of SMTP mail server associated with ‘name’.

Section 2.5  
R21. In BitTorrent, suppose Alice provides chunks to Bob throughout a 30-second interval. Will Bob necessarily return the favor and provide chunks to Alice in this same interval? Why or why not? (1 mark)

No because sending/receiving priority is dependent on the highest rated transfer speed. While Alice may provide chunks to Bob, Bob may calculate Alice’s connection to not be within his top 4 thus Bob would not reciprocate. On the other hand, Bob can reciprocate by “optimistically unchoking” Alice later.

Section 2.6  
R24. CDN typically adopts one of two different server placement philosophies. Name and briefly describe them. (1 mark)

Enter Deep: push CDN servers into many networks making closer to users (costs many servers)

Bring Home: Larger clusters of POPs close to access nets.

Section 2.7  
R27. For the client-server application over TCP described in Section 2.7, why must the server program be executed before the client program? For the client-server application over UDP, why may the client program be executed before the server program? (1 mark)

1. Server needs to first create the socket that allows for clients to contact.
2. UDP does not require handshaking before sending data, thus a client’s program may run before the server does because it is not waiting. However, this may result in resending of data to the server.

Problems

P1. True or false? (5 marks)

1. A user requests a Web page that consists of some text and three images. For this page, the client will send one request message and receive four response messages. False
2. Two distinct Web pages (for example, www.mit.edu/research.html and www.mit.edu/students.html) can be sent over the same persistent connection. True
3. With non-persistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages. False
4. The Date: header in the HTTP response message indicates when the object in the response was last modified. False
5. HTTP response messages never have an empty message body. False

P6. Obtain the HTTP/1.1 specification (RFC 2616). Answer the following questions: (4 marks)

1. Explain the mechanism used for signaling between the client and server to indicate that a persistent connection is being closed. Can the client, the server, or both signal the close of a connection?

Each http response must include a connection header field that specifies the options that are desired for a connection. By sending a http response with ‘connection: close’ the connection cannot be considered persistent after the current response. Both Server and client can indicate a closed connection by responding with ‘connection: close’.

1. What encryption services are provided by HTTP?

There are no encryption services.

1. Can a client open three or more simultaneous connections with a given server?

Yes, by pipelining a client can make multiple simultaneous connections.

1. Either a server or a client may close a transport connection between them if either one detects the connection has been idle for some time. Is it possible that one side starts closing a connection while the other side is transmitting data via this connection? Explain.

Yes, it is possible thus, clients, servers, and proxies must be able to recover from asynchronous close events. Clients, servers, and proxies should reopen the transport connection and retransmit the aborted sequence.

P16. Read the POP3 RFC, RFC 1939. What is the purpose of the UIDL POP3 command? (1 mark)

Gives a Unique ID Listing for a message.

P32. What is the Apache Web Server? How much does it cost? What functionality does it currently have? You may want to look at Wikipedia to answer this question. (6 marks)

It is a popular open-source, cross-platform web server. Free. Accepts requests from clients and sends responses to clients, uses HTTP protocol, Sends web pages or files as responses to requests, Modular architecture allows one to add or replace existing features to extend core functionality.