Quiz-1 for Computer Network

Date: October 19, 2022（90minutes）

I. Acronyms match the acronyms to the questions, using each acronym once: IEEE, IMAP, RFC, RST, TCP, TLD, TDM.

1) A mail access protocol which has more features than POP3.

2) The documents used by the IETF to describe protocol standards.

3) The term for a primary DNS zone such as .com or .org or .cn.

4) It's a channel partitioning protocol, which divides time into time frames and further divides each time frame into N time slots. Each time slot is then assigned to one of the N nodes.

Answer: **1)**_____ **2)**_____

3)_____ **4)**_____

II. Single choice.

(1) Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates R1 = 500 kbps, R2 = 2 Mbps, and R3 = 1 Mbps. Assuming no other traffic in the network, the throughput for the file transfer is（ ）.

A. 2Mbps B. 1Mbps C. 1.16Mbps D. 500kbps

(2) Suppose two hosts, A and B, are separated by 20,000 kilometers and are connected by a direct link of R = 2 Mbps. Suppose the propagation speed over the link is 2.5×10^8 meters/sec, the bandwidth-delay product R·dprop is（ ）.

A. 160,000 bits B. 160,000 bytes C. 16,000 bits D. 16,000 bytes

(3) In the "store-forward" packet switching network shown in Figure 1, the data transmission rate of all links is 100Mb/s, the packet size is 1000B, where the packet header size is 20B. If host H1 sends a 980000B file to host H2, without considering propagation delay, the time required from H1 sending to H2 receiving is at least ( ).

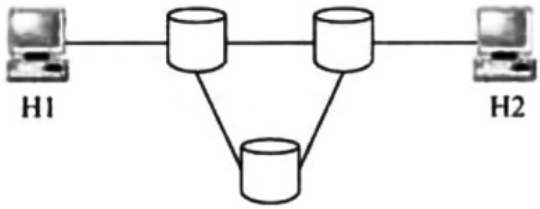

Figure 1: packet switching network

A. 80ms B. 80.08ms

C. 80.16ms D. 80.24ms

(4) In the following statements about C/S model and P2P model, the incorrect one is ( ).

A. For the C/S model, the client must know the address of the server in advance, while the server does not need to know the address of the client in advance.

B. For the C/S model, the server is dedicated to completing certain services, and the client is the consumer of those services.

C. P2P network is a physical network which is constructed in parallel with the Internet and consists of peer-to-peer nodes.

D. P2P mode is a working mode in which network nodes exchange information directly through peer-to-peer mode.

(5) Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What transport layer protocols are needed in this scenario? （ ）.

A. DNS and HTTP　　B. TCP for DNS; TCP for HTTP

C. UDP for DNS; TCP for HTTP　　D. All of the above are correct responses.

(6) When you receive your Email from QQ.com, the system use ( ) protocol.

A. HTTP　　B. FTP

C. POP3　　D. SMTP

(7) A single host can run multiple network application programs, e.g., a Web browser, an e-mail client, etc. How can different application programs running on the same host be uniquely identified? ( )

A. Domain Name　　B. IP

C. Port Number　　D. Socket

(8) In the following protocol, a connection-less protocol is used between the client and the server. ( )

A. HTTP　　B. FTP

C. POP3　　D. DNS

III. Decide true or false (T or F).

1) In addition to transmitting ASCII , SMTP can also transmit binary data.( )

2) In packet-switched networks , the resources (buffers,link transmission rate) needed along a path to provide for communication between the end systems are reserved for the duration of the communication session between the end systems.( )

3) There are four important delays in packet-switched network: processing delay, queuing delay, transmission delay and propagation delay. ( )

4) FTP can transfer files between two hosts using different operating systems and with different file formats. ( )

IV. Comprehensive problems.

1. Consider a packet of length L which begins at end system A and travels over three links to a destination end system. These three links are connected by two packet switches. Let d_i, s_i, and R_i denote the length, propagation speed, and the transmission rate of link i, for i = 1, 2, 3. The packet switch delays each packet by d_{proc}. Assuming no queuing delays, in terms of d_i, s_i, R_i , (i = 1,2,3), and L, what is the total end-to-end delay for the packet?

Suppose now the packet is 1,500 bytes, the propagation speed on all three links is 2.5×10^8 m/s, the transmission rates of all three links are 2 Mbps, the packet switch processing delay is 3 msec, the length of the first link is 5,000 km, the length of the second link is 4,000 km, and the length of the last link is 1,000 km. For these values, what is the end-to-end delay?

2. Consider the following string of ASCII characters that were captured by Wireshark when the browser sent an HTTP GET message (i.e., this is the actual content of an HTTP GET message). The characters <cr><lf> are carriage return and line-feed characters (that is, the italized character string <cr> in the text below represents the single carriage-return character that was contained at

that point in the HTTP header). Answer the following questions, indicating where in the HTTP GET message below you find the answer. (10 points)

GET /cs453/index.html HTTP/1.1<cr><lf>Host: gai
a.cs.umass.edu<cr><lf>User-Agent: Mozilla/5.0 (
Windows;U; Windows NT 5.1; en-US; rv:1.7.2) Gec
ko/20040804 Netscape/7.2 (ax) <cr><lf>Accept:ex
t/xml, application/xml, application/xhtml+xml, text
/html;q=0.9, text/plain;q=0.8,image/png,*/*;q=0.5
<cr><lf>Accept-Language:en-us,en;q=0.5<cr><lf>Accept-
Encoding: zip,deflate<cr><lf>Accept-Charset: ISO
-8859-1,utf-8;q=0.7,*;q=0.7<cr><lf>Keep-Alive: 300<cr>
<lf>Connection:keep-alive<cr><lf><cr><lf>

1） What is the URL of the document requested by the browser?

2） What version of HTTP is the browser running?

3） Does the browser request a non-persistent or a persistent connection?

4） What type of browser initiates this message? Why is the browser type needed in an HTTP request message?