Question 1 - Latency through a Network

Delay :

Data size = 1000 bytes = 8 *1000 bits

Distance A(source -> router1) = 1000Km = 1000000m

Distance B(router1 -> destination) = 5000Km = 5000000m

Transmission speed A(source -> router1) = 1Mb/s = 1 * 10^6 b/s

Transmission speed B(router1 -> destination) = 20Mb/s = 20 *10^6 b/s

Propagation speed = 250000000 m/s

process delay = 0.001 s

Propagation delay A(source -> router1) = 1000000 m / 250000000 m/s = 0.004 s

Propagation delay B(router1 -> destination) = 5000000 m / 250000000 m/s = 0.02 s

Transmission delay A(source -> router1) = 8000 b / 1 * 10^6 b/s = 0.008s

Transmission delay B(router1 -> destination) = 8000 b / 20 *10^6 b/s = 0.0004s

Total delay = Transmission delay A + Transmission delay B + Propagation delay A + Propagation delay B + process delay = 0.0334s

Effect on other traffic :

Queuing delay occurs when packets have to wait in a queue before they can be processed by the router. If there is other traffic at the router, it will introduce additional queuing delay.

Question 2 - Packet switching and Circuit switching (K&R)

1. 2 Mbp / 1 Mbp = 2 family members
2.

I: Because there is enough bandwidth available on the link. Packets can be transmitted immediately without queuing.

II. because 2 users will only use up to 2Mbp so if the number of members is bigger than 2, devices are subject to queuing delays

III. 20%

IV. 0.2 * 0.2 * 0.2 = 0.008

Question 3 - Peer to Peer (P2P) and Client Server (K&R)

File size: 10 * 10^9 bits (10Gbits)

Server – upload: 20 Mbps

Peers: N peers – 10, 100, 1000

Peers – download: 1Mbps

Peers –upload: u: 200Kbps, 600Kbps, 1Mbps

Client–server:

transmission time : file size / server upload time = 10 * 10^9 bits / (20 Mbits/s) = 10 * 10^9/ 20 * 10^6 = 500s
Peer – 10: 500*10 = 5000s
Peer – 100: 500*100 = 50000s
Peer – 1000: 500*1000 = 500000s
Min = 5000s

P2P:
transmission time :500s
Slowest peer download time = 10 * 10^9 bits / 1 * 10^6 = 10000s
Min = 10000s

Question 4 - HTTP
Answer: Because blank lines separating headers and responses are part of the HTTP protocol, this blank line separation is used by the client and server to parse the message correctly. The blank line is a separator to indicate to the client and the server that all the headers have been sent, followed by the message body. Therefore, this blank line cannot be removed. If to do so, it will not be parsed correctly.

content–length header is necessary, because it helps to isolate the required content for citation. Without Content–Length, clients cannot distinguish between a successful connection closure at the end of a message and a connection closure due to a crash of the message broker.

Question 5 - Caching and DNS
1. The web proxy server checks to see if there are cached web pages and images. If there are, they are returned directly to the browser.
2. The browser sends a request to the local DNS to resolve the IP address corresponding to the domain name. The local DNS returns the IP address to the browser. The browser uses this IP address to send an HTTP request directly to the origin server, requesting web pages and images. The origin server responds to the request by sending the web pages and images. Because the web pages and images are not cached on the proxy server or in the browser, they are loaded directly in the browser.
3. The browser sends a request to the local DNS to resolve the IP address corresponding to the domain name. The local DNS returns the IP address to the browser. The browser uses this IP address to send an HTTP request directly to the origin server, requesting web pages and images. The origin server responds to the request by sending the web pages and images. Because the web pages and images are not cached on the proxy server or in the browser, they are loaded directly in the browser.

According to the light speed: 1500km/(200000km/s) = 0.0075s

Question 7 - Learning to Read a protocol specification

Answer:

The HEAD method is the same as GET, except that the server cannot return any of the entity bodies in the response. The meta information contained in the HTTP header of the response to the HEAD request should be the same as the information sent in response to a GET request. This method can be be used to obtain meta–information about the identified resource via the Request–URI without transmitting the Entity–Body itself. This method is often used to test the validity, accessibility, and recent modifications of hypertext links. accessibility and recent modifications. There is no "conditional HEAD" request like the conditional get. If the HEAD contains an If–Modified–Since header field, it should be ignored. request, it should be ignored.

Question 6

I wish there were more examples on the subject of Peer to Peer (P2P) and Client Server (K&R) to give us practice