**CSE421**

**Lab 02 Home Task**

**Spring 2022**

**Write answers to the following questions.**

1. How would a proxy server check to see if it’s data is up to date with the most updated data in the Origin Server?

Answer: The proxy server can perform a check if necessary to determine if the document is up to date. It then refresh the cache if its old. As frequently checking documents wnill decrease the performance.So, the proxy server uses date & last modified factors to check if a data is up to date in the origin server.

1. The HTTP protocol is implemented in the Physical layer. Is this statement true or false?

Answer: No, because the HTTP protocol is used in Application Layer. The statement is false.

1. Can you receive mail using SMTP, why or why not?

Answer: SMTP is a message transfer protocol so it sends any mail as message to the server. So, SMTP can not recieve mail.

1. Briefly explain how SMTP and POP3 protocol works using a scenario.

Answer: SMTP is a message transfer protocol so it sends any mail to the server. And, POP3 collects the mail from the server. The SMTP protocol is used to send emails to the email server and POP3 is used to receive emails from an email server. So that is why both are important and so is this interaction between these two as:

In SMTP protocol the first step includes verification of the computer configuration through which an email is sent and granting permission for the process. In the second step, it sends out the message and follows the successful delivery of the email.

In POP3 the first step includes verification of the computer configuration through which an email is sent and granting permission for the process. In the second step, it sends out the message and follows the successful delivery of the email.

1. Why does root DNS servers maintain a hierarchical structure rather than a centralized structure?

Answer: DNS server maintains a hierarchical structure rather than a centralized structure as it follows distributed system.

1. Suppose, you have a quiz which will take place at bux but your local DNS server does not know the IP address of “bux.bracu.ac.bd”. Will you be able to attend your quiz? Please, provide a brief explanation.

Answer: No, as my local DNS server does not know the IP address of the url so it cannot provide me the MAC address, therefore I cannot be able to attend my quiz.

1. Suppose, you recently changed your ISP and the new ISP forgot to set the DNS server’s IP address when configuring your internet connection. Can you now browse the internet properly?

Answer: No. So for the DNS server’s IP address the ARP request will be sent to find it.

1. What is the size of an ARP request or reply packet (in bytes)?

Answer: The size of an ARP request or reply packet is 28 bytes.

1. What happens to an ARP request packet when it is received by a host that does not match the target IP address of the request?

Answer: It rejects the packet.

1. What is the value of the 'operation' field in an ARP reply packet?

Answer: 2

1. What flags are used during a TCP connection establishment and

Answer: “SYN”, “ACK” and “FIN” flags are used during a TCP connection establishment and “FIN”, “TCP” flag are used during TCP connection termination process.

1. A web server sends a TCP packet to a client with sequence number=0 and acknowledgement number =1. Which stage of the 3 way handshake is this and what does the sequence and acknowledgement number mean?

Answer: To establish a connection, TCP uses a three-way handshake. Before the client tries to connect to the server, it must first connect and listen for a port to open that port for connections which is called a passively open port. Once the passive opening is established, the client can start the active opening. To establish a connection, a three-way (or 3-way) handshake occurs:

SYN: An active opening performed by the client sending a SYN to the server. The customer sets the fractional sequence number to a random value A.

SYN-ACK: In response, the server responds with a SYN-ACK. The acknowledgment number is set to more than the sequence number received and the sequence number the server chooses for the packet is another random number, B ,

ACK: Finally, the client sends the ACK back to the machine. owner. The sequence number is set to the received commit value and the commit number is set to more than the received sequence number. At this point, both the client and the machine The host receives the connection confirmation. Steps 1, 2 set the connection parameter (sequence number) for one direction and it is confirmed. Steps 2, 3 set connection parameter (sequence number) for other direction and it is confirmed. With these, fullduplex communication is established.

The sequence number is the byte number of the first byte of data in the TCP packet sent and the acknowledgement number is the sequence number of the next byte the receiver expects to receive.

1. In an outbound PDU packet, what does source port: 80 and destination port: 1027 means?

Answer: Source port 80 refers to HTTP & destination port 1027 refers to TCP.