**CSE421**

**Lab 02 Home Task**

**Fall 2022**

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**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?

**Ans:** Using a conditional GET HTTP request, a proxy server would check to see if it’s data is up to date with the most updated data in the Origin Server.

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

**Ans:** This statement is false as the HTTP protocol is implemented in the Application layer.

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

**Ans:** No, because A push protocol is what SMTP is. It simply transmits email from one server to another server and from the client to the server.

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

**Ans:** Let's say that Zubair wants to send a message to his friend Lenin via email. Now, making use of the SMTP protocol, Zubair will send his email to the email server that he uses. In the event that Lenin uses a separate email server that operates on the SMTP protocol. Zubair's email server will send the message to Lenin's email server. Now, in order to retrieve and download the email, Lenin will make use of the POP3 protocol.

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

**Ans:** A centralized organization would have problems such as having a single point of failure and being vulnerable to security breaches. Additionally, the operation and maintenance of a massive DNS server will be both time-consuming and expensive.

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.

**Ans:** Yes, I will be able to attend the quiz.

In an iterative process, the local DNS server will initially query the root DNS server for the IP address if it does not already know it. The DNS server for the top-level domain, ".ac.bd," can be found by querying the root DNS server for its IP address. Then, the authoritative name server IP address for "bracu.ac.bd" will be retrieved from the root DNS server. To obtain the IP address for 'bux.bracu.ac.bd', a DNS query will be made using the 'bracu.ac.bd' server.

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?

**Ans:** No. It is because my device will look for the local DNS server anytime I will type in any URL. If it doesn't get that, it won't be able to determine which IP address is associated with a certain URL. However, I may access the site, though, if I know its IP address.

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

**Ans:** 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?

**Ans:** Since doing so will lengthen the time it takes to withdraw the withdrawal request, it will be thrown away.

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

**Ans:** The value of the ‘operation’ field in ARP reply is 0x0002.

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

**Ans:** When establishing a TCP connection, the SYN (synchronization) and ACK (acknowledgement) flags are used. When a TCP connection is terminated, the FIN (finish) flag is used.

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?

**Ans:** This is the second stage of the 3 way handshake. As the acknowledgement number is 1, the server has the data delivered during the first stage of the three-way handshake until sequence 0. It is therefore the second stage.

The sequence number is the number of the first byte of data contained in the TCP packet that was transmitted (also called a TCP segment). The sequence number of the next byte that the receiver anticipates receiving is what is known as the acknowledgement number.

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

**Ans:** Source port 80 indicates that this is an HTTP response from a website, and since port 1027 is for TCP/UDP, it is destined for a process.