**CSE421**

**Lab 02 Home Task**

**Summer 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**: A proxy server checks if its data is up to date or not by using conditional GET HTTP request.

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

**Answer**: False. Because HTTP protocol is implemented in the Application layer.

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

**Answer**: No cause SMTP is a push protocol. It only sends email from client to server and server to server.

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

**Answer**: Suppose, Alex wants send an email to his friend James. Now, Using SMTP protocol, Alex will send his email to his email server. If James uses a different email server, using SMTP protocol, Alex’s email server will send the email to James’ email server. Now, James will use POP3 protocol to retrieve and download the email.

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

**Answer**: Centralized structure would have issues like single point of failure, being prone to security attacks. Also, maintaining a huge DNS server will be both costly and difficult.

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**: Yes, I will be able to attend. If the local DNS server doesn’t have the IP address in iterative approach it will first ask the root DNS server. The root DNS server will provide the IP address of top level domain server which is of the ‘.ac.bd’ DNS server. Then top level DNS server will be queried to get the IP of an authoritative name server of ‘bracu.ac.bd’. Then the ‘bracu.ac.bd’ DNS server will be queried to get the IP address for ‘bux.bracu.ac.bd’.

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, whenever I will type any url, my device will search for the local DNS server. Upon not getting that it won’t know which IP address the given url has been assigned to. But I can browse if I know the IP address of the website.

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

**Answer**: 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 will be discarded as it will increase the request time to give up.

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

**Answer**: Value of ‘operation’ field in ARP Reply is 0x0002

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

**Answer**: SYN (synchronization) and ACK (acknowledgement) flags are used to establish TCP connection. On the other hand, FIN (finish) flag is used in 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**: This is the second stage of the three way handshake. As the acknowledgement number is 1, the server has the data until sequence 0 which was sent during the first stage of three way handshake. So, it is the second stage.

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

**Answer**: Source port 80 means that this is HTTP response from a webserver and it is headed for a process since port 1027 is for TCP/UDP.