CSE421

Lab-02

Homework Questions on HTTP, ARP, TCP, Email and DNS

1. In which layer ARP protocol Operates?

Data Link Layer.

1. By checking which section of a TCP packet one can identify if it is a TCP packet for opening the connection or closing the connection? Explain how?

We can understand it by seeing Flag bits. If the flag bit is SYN which stands for opening a connection and FIN stands for terminating a connection.

1. Why does a PC send an ARP request to every other device on the network?

In ARP request it has the destination's IP address but it doesn't have the mac address. Therefore, when a PC sends this ARP packet, it sends the packet to the all the devices and match the IP address of the devices and the IP address inside the packet. If the IP address matches, then ask for the mac address of that device.

1. Suppose, you want to access facebook.com and your PC already knows its local DNS server. Which protocol between ARP and DNS will be executed first and why?

A PC already knows the IP address of local DNS server so, now it needs mac address of local DNS server so it will send an ARP packet after getting the mac address from local DNS server pc will send a DNS request for the IP address of facebook.com.

1. Suppose PC1 [IP Address: 192.168.2.1, MAC Address: 0010. 1191.A946] is sending an ARP packet to PC2 [IP Address: 192.168.2.2, MAC Address: 0110. 1290.AD23]. What will be written in the target MAC address before the packet reaches PC2.

Target MAC address: 0000.0000.0000

1. For the same scenario mentioned above, what will be the target IP address?

Target IP address: 192.168.2.2

1. In which layer of OSI model does HTTP works?

Application Layer

1. If the flag section of the TCP packet contains 000010, what type of TCP packet will that be?

000010 means SYN which states that it’s a packet for opening a connection.

1. What does the content length mean in an http packet?

The Content-Length defines the length of the body of the message inside the http packet in bytes.

1. How many TCP packets does the Client PC send to the server in the process of an HTTP request?

Total 4 packets.

1. Why do we need two protocols (SMTP and POP3) for mail transfer?

For sending a mail to the mail server we need SMTP protocol and for retrieving the mail from the mail server we need POP3 protocol.

1. In a TCP packet coming back from the server, the sequence number is written as 100 and the acknowledgement is written as 250. What do you understand from this scenario? Explain.

The sequence number is ‘100’ which means that the first byte of the packet that has been sending has a sequence number of ‘100’. The acknowledgement number ‘250’ means that it is expecting for packet which will have sequence number ‘250’.

1. If a device can be located using an IP address, then why do we need MAC address for a device?

We need mac address to locate because IP addresses are used to uniquely identifies the connection of network with that device take part in a network. On the other hand, MAC Address is used to ensure the physical address of computer.

1. In which layer of OSI model does DNS works?

Application layer.

1. How does your laptop know it’s local DNS server?

When we request for a http request our pc will send an ARP packet and it will look for local DNS server. It needs a mac address of local DNS server in order to pass the DNS request.