CSE421

Lab-02

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

1. **In which layer ARP protocol Operates?**  
    => Network Layer and Data Link layer
2. **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?**   
   => By Control flag section of a TCP packet one can identify if it is a TCP packet for opening the connection or closing the connection.
3. **Why does a PC send an ARP request to every other device on the network?**   
   => A pc send an ARP request to every other device on the network because at the very beginning the pc doesn’t know which device it need’s to send the data. So , it sends ARP request to every device on the network to retrieve the MAC Address of the device of which it wants to communicate with.
4. **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?**   
   => ARP will be executed first because it at first has to know the MAC address of the local DNS server before it can start communication.
5. **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.**   
   => 0000.0000.0000
6. **For the same scenario mentioned above, what will be the target IP address?**   
   => 192.168.2.2
7. **In which layer of OSI model does HTTP works?**  
   => Application layer
8. **If the flag section of the TCP packet contains 000010, what type of TCP packet will that be?**=> 000010 represents SYN TCP Control Flag. This is used as a first step in establishing a three-way handshake between two devices.
9. **What does the content length means in an http packet?**  
   => The content length header is a number denoting an the exact byte length of the HTTP body
10. **How many TCP packets does the Client PC send to the server in the process of an HTTP request?**   
    => 3
11. **Why do we need two protocols (SMTP and POP3) for mail transfer?**  
    => We need two protocols for mail transfer because SMTP is used only to send email to mail server whereas POP3 is used to receive or download mail only from mail server.
12. **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.**  
    => Sequence number is written as 100, it means that server is sending data from 100 and the acknowledgement is written as 250 ,it means that it has received data until 249 and ready to receive from 250.
13. **If a device can be located using an IP address then why do we need MAC address for a device?**  
    => MAC address and IP address both are in different layers of network model. MAC addresses are used to identify machines within the same broadcast network on layer 2, while IP addresses are used on layer 3 to identify machines throughout different networks. Since every layer is using underlying layers, it is essential to have both the address to locate a device.
14. **In which layer of OSI model does DNS works?**  
    => Application layer
15. **How does your laptop know it’s local DNS server?**=> The laptop sends ARP request to all the devices connected to its network. Only the local DNS server returns the ARP to my laptop and the other devices drops the ARP request that was sent. In this way, the laptop knows the MAC address of its local DNS server. To get the IP address, it sends DNS request to the DNS local server, the DNS server replies with a DNS response along with its IP. This is how my laptop will be able to know it’s local DNS server.