DHCP Questions

1. **Are DHCP messages sent over UDP or TCP? How do you know that a message belongs to DHCP? Is it the protocol field in the IP header?**

   DHCP messages are sent over UDP.
   When clicking at the details of the packet header, a section says it uses UDP.
   Yes, the IP header also states that it is UDP protocol as well.

2. **What is the link-layer (e.g., Ethernet) address of your machine?**

   3c:6a:a7:9a:d0:e4

3. **Draw a timing datagram illustrating the sequence of the first four-packet Discover/Offer/Request/ACK DHCP exchange between the client and server. For each packet, indicate the source and destination port numbers. Are the port numbers the same as in the example given in this lab assignment? (To access flow diagram of DHCP : Go to statistics →Flow Diagram →select Limit to Display filter)**

   See 3.pdf for the flow diagram
   Source:
   - Port 68
   - Port 67
   - Port 68
   - Port 67

   Destination:
   - Port 67
   - Port 68
   - Port 67
   - Port 68

   Yes, the port number is the same as the example.

4. **What is the purpose of the Transaction-ID field? What is the value of the Transaction-ID in each of the first four (Discover/Offer/Request/ACK) DHCP messages?**

   The purpose of the Transaction-ID is to allow the host to differentiate between different requests made by the user.

   Transaction ID:
   - 0xb5ac4a12
   - 0xb5ac4a12
   - 0xb5ac4a12
   - 0xb5ac4a12

5. **What are the values of the Transaction-ID in the second set (Request/ACK) set of DHCP messages?**

   Transaction ID:
   - 0xa6ddd4be
   - 0xa6ddd4be

6. **A host uses DHCP to obtain an IP address, among other things. But a host's IP address is not confirmed until the end of the four-message exchange! If the IP address is not set until the end of the four-message exchange, then what values are used in the IP datagrams in the four-message exchange? For each of the four DHCP messages (Discover/Offer/Request/ACK DHCP), indicate the source and destination IP addresses that are carried in the encapsulating IP datagram.**

   Values:
   - 0.0.0.0
   - 0.0.0.0
   - 0.0.0.0
   - 0.0.0.0

   Source:
   - 0.0.0.0
   - 192.168.1.1
   - 0.0.0.0
   - 192.168.1.1

   Destination:
   - 255.255.255.255
   - 192.168.1.29
   - 255.255.255.255
   - 192.168.1.29

7. **What values in the DHCP discovery message differentiate this message from the DHCP request message?**

   The value is Offer (2) in Option 53.

8. **What is the IP address of your DHCP server?**

   192.168.1.1

9. **What IP address is the DHCP server offering to your host in the DHCP Offer message? Indicate which DHCP message contains the offered DHCP address.**

   The IP address is 192.168.1.1.
   Option 53 contains the offered DHCP message.

10. **In the example screenshot in this assignment, there is no relay agent between the host and the DHCP server. What values in the trace indicate the absence of a relay agent? Is there a relay agent in your experiment? If so, what is the IP address of the agent?**

    The value given is 0.0.0.0. The IP address in the experiment also indicates a value of 0.0.0.0, which means there is no relay agent.

11. What other information is required apart from the client IP address for the client to start communicating? Does the offer message include this information?

12. **Explain the purpose of the router and subnet mask lines in the DHCP offer message.**

    The router line tells the client where to send messages by default.
    The subnet mask line tells the client which subnet mask should be used.

13. **Explain the purpose of the lease time. How long is the lease time in your experiment?**

    The purpose of the least time is to provide the amount of time the DHCP server assigns an IP address to a client.
    The lease time is one day.

14. **What is the purpose of the DHCP release message? Does the DHCP server issue an acknowledgement of receipt of the client's DHCP request? What would happen if the client's DHCP release message is lost?**

    The purpose of the DHCP release message is to cancel the lease on an IP address given to it by the DHCP server.
    There is no verification that the release message has been received.
    If the DHCP release message is lost, the client will release the IP address; however, the server will not reassign that address until the client's lease on the address expires.