I have included two pdf files with my submission. One is labelled ‘packets’ and it contains annotations for all of my answers for questions 3-9, and 12. The other one, ‘packets-ethereal-trace’ contains the annotations for my answers to questions 11 and 13-14. The screenshots of my command prompt during the experiment can be found at the end of this file.

1. Are DHCP messages sent over UDP or TCP?

UDP

1. 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?
2. What is the link-layer (e.g., Ethernet) address of your host?

ac:ed:5c:b8:d8:00

1. What values in the DHCP discover message differentiate this message from the DHCP request message?

option 53: Discover has value 1 and request has value 3

1. What is the value of the Transaction-ID in each of the first four (Discover/Offer/Request/ACK) DHCP messages? What are the values of the Transaction-ID in the second set (Request/ACK) set of DHCP messages? What is the purpose of the Transaction-ID field?

0x7106b7c4

1. 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!
   1. 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?

0.0.0.0, 255.255.255.255, 192.168.0.1, and 192.168.0.16

* 1. 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.

Discover: src (0.0.0.0), dest (255.255.255.255)

Offer: src (192.168.0.1, dest (192.168.0.16)

Request: src (0.0.0.0), dest (255.255.255.255)

ACK: src (192.168.0.1), dest (192.168.0.16)

1. What is the IP address of your DHCP server?

192.168.0.1

* 1. What IP address is the DHCP server offering to your host in the DHCP Offer message?

192.168.0.16

* 1. Indicate which DHCP message contains the offered DHCP address.

No.2125

1. In the example screenshot in this assignment, there is no relay agent between the host and the DHCP server.
   1. What values in the trace indicate the absence of a relay agent?

Instead of a destination of 255.255.255.255 the value is 0.0.0.0

* 1. Is there a relay agent in your experiment?

Yes

* 1. If so, what is the IP address of the agent?

255.255.255.255

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

To provide functionality with default IP addresses when one has not been set for the client yet.

1. In the DHCP trace file noted in footnote 2, the DHCP server offers a specific IP address to the client (see also question 8. above).
   1. In the client’s response to the first server OFFER message, does the client accept this IP address?

Yes

* 1. Where in the client’s RESPONSE is the client’s requested address?

*See annotated pdf file*

* 1. Explain the purpose of the lease time.

It sets the amount of time that a proposed IP address will be valid

* 1. How long is the lease time in your experiment?

1 Hour

1. *I used the ethereal trace file to answer this question*
   1. What is the purpose of the DHCP release message?

Tells the server that the client is done using the given IP address

* 1. Does the DHCP server issue an acknowledgment of receipt of the client’s DHCP request?

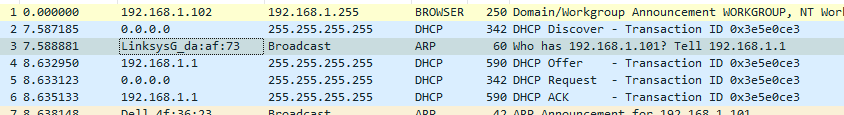
Yes

* 1. What would happen if the client’s DHCP release message is lost?

The lease time would expire and the server would check to see if the client is still using the IP, depending on if the client is still using the address or not, the server would then release or maintain the address.

1. Clear the bootp filter from your Wireshark window. Were any ARP packets sent or received during the DHCP packet-exchange period?

Yes



Screenshots from my experiment:

