CS 359

COMPUTER NETWORK LAB

ASSIGNMENT 6

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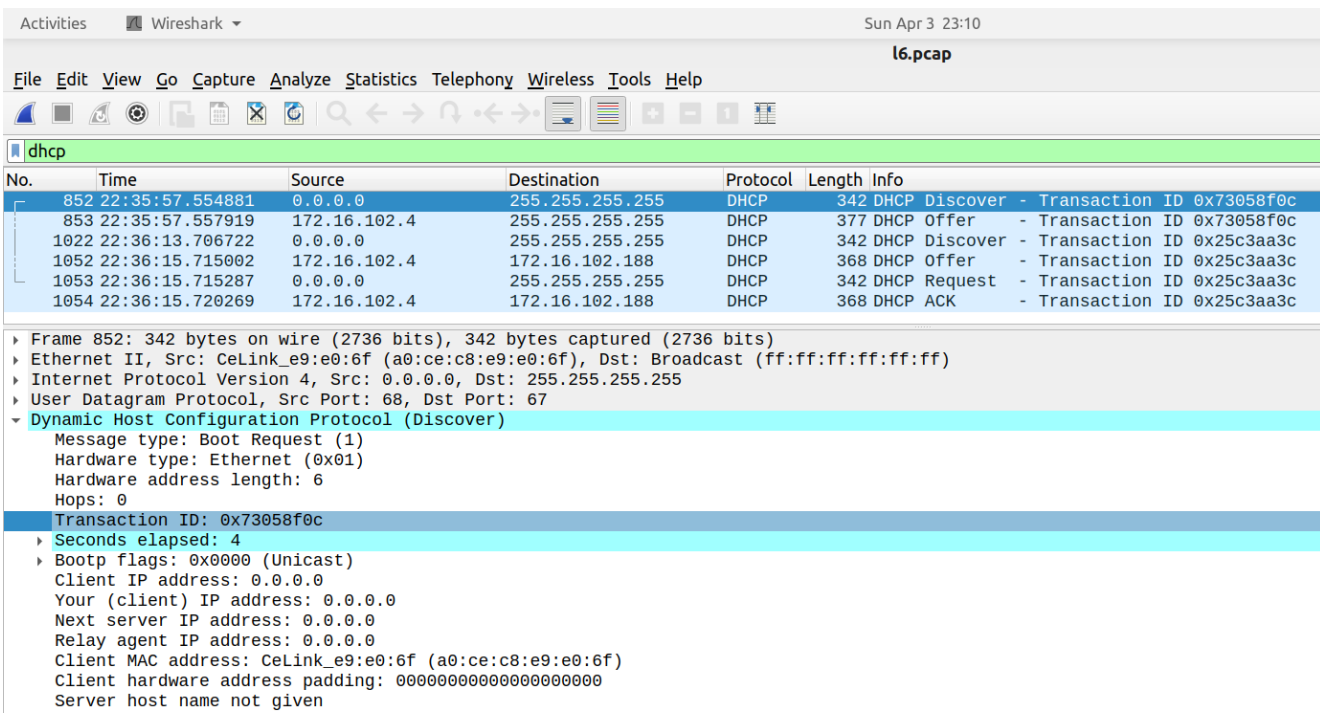
1. Answer the following questions based on your examination of the DHCP fields for both the DHCP Request and DHCP Ack.

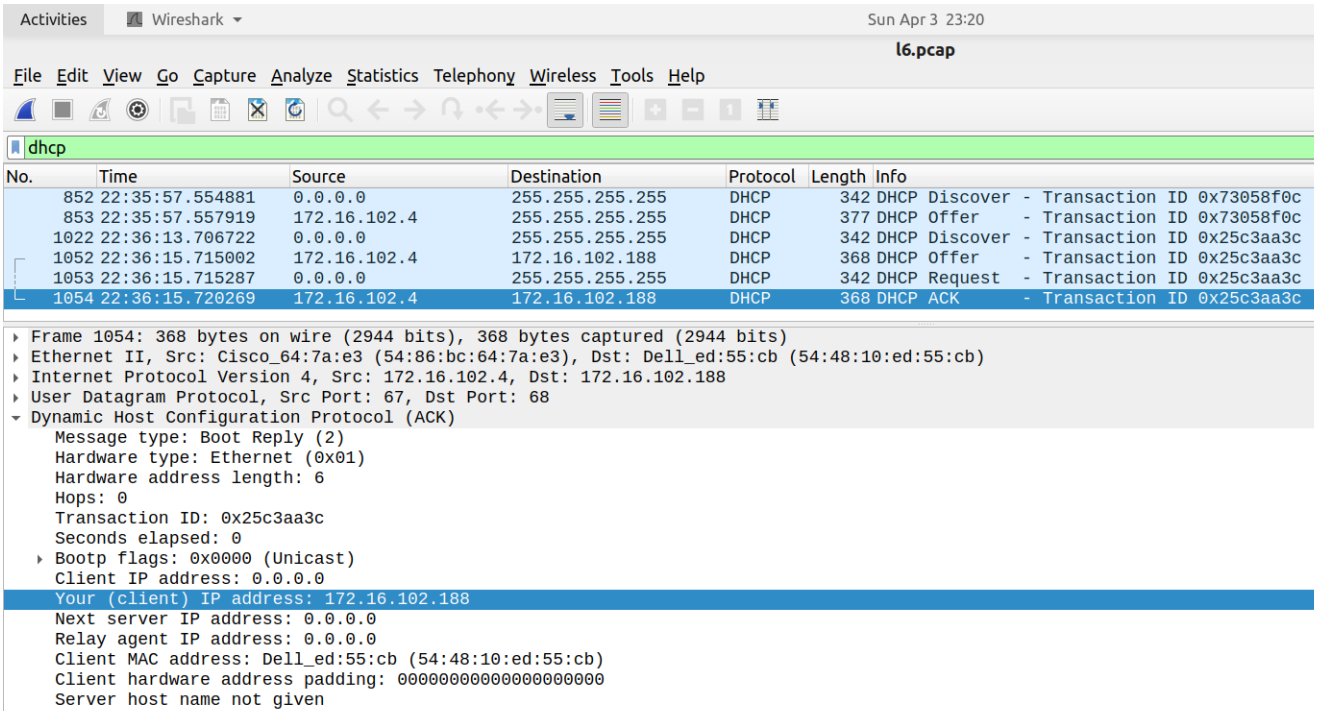
a. How long is the Transaction ID field? Say whether it is likely that concurrent DHCP operations done by different computers will happen to pick the same Transaction ID.



Transaction ID size = 32 bits

Thus, the probability that concurrent DHCP operations done by different computers will happen to pick the same Transaction ID in (2^32-1) = 4.3 Billion addresses is very unlikely.

b. What is the name of the field that carries the IP address that is being assigned to the client? You will find this field filled in on the DHCP Ack, as that message is completing the assignment.



Your (client) IP address (or dhcp.ip.your) carries the IP address that is being assigned to the client.

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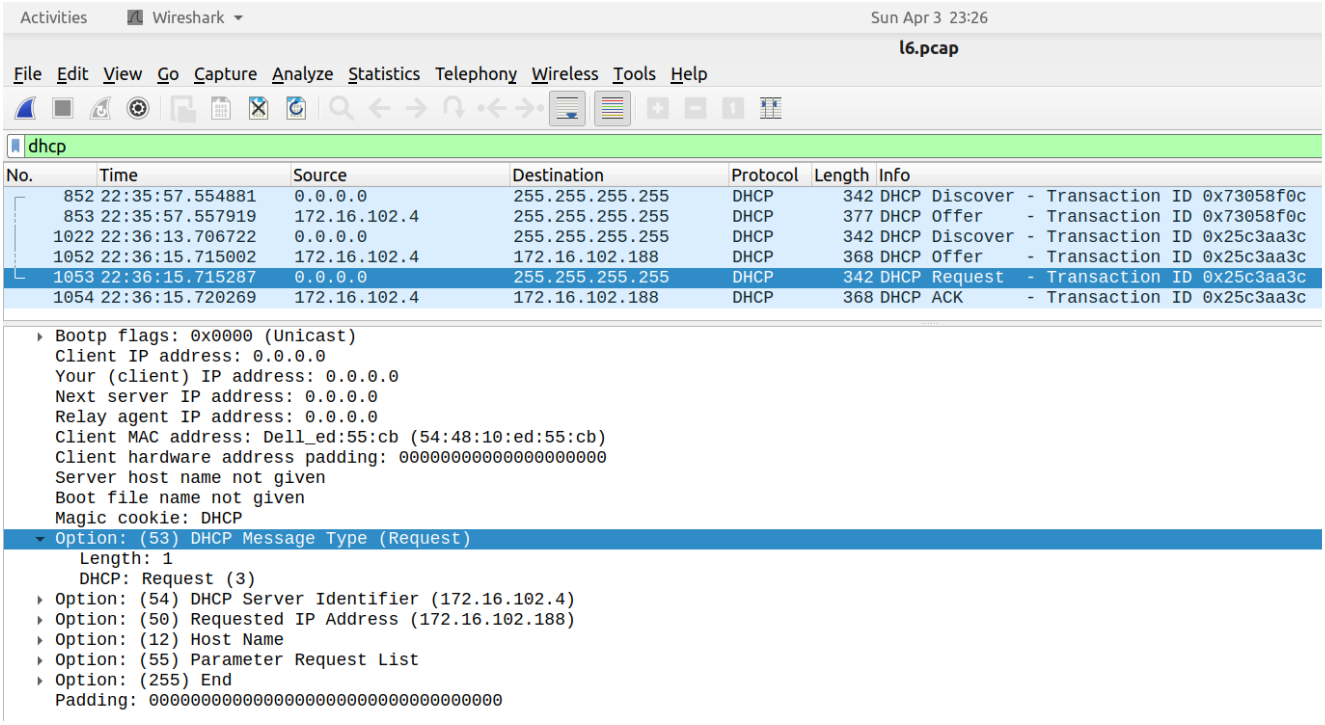
c. The first DHCP option is DHCP Message Type. What option value stands for this type? DHCP Requests will typically have a Client Identifier option. Look at the value of this option. How does it identify the client? Take a guess.



The option value of 53 stands for DHCP Message Type.

It is typical for the Client Identifier to carry the Ethernet address of the client, but possible to use some other kind of identifier (e.g., hostname, serial number).

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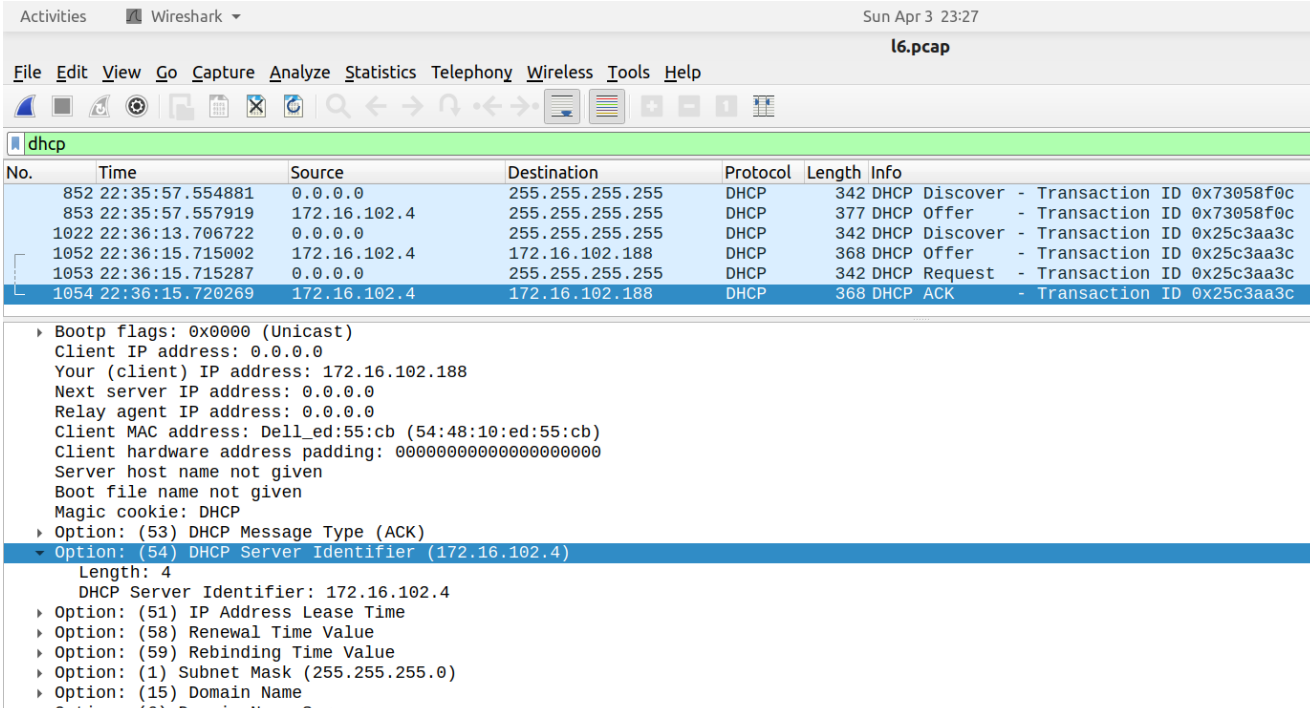
d. DHCP Acks typically have a Server Identifier option. Look at the value of this option. How does it identify the server? Take a guess.



The option value of 54 stands for DHCP Server Identifier.

In this, a server Identifier carries the IP address of the DHCP server but it is possible to use some other kind of identifier.

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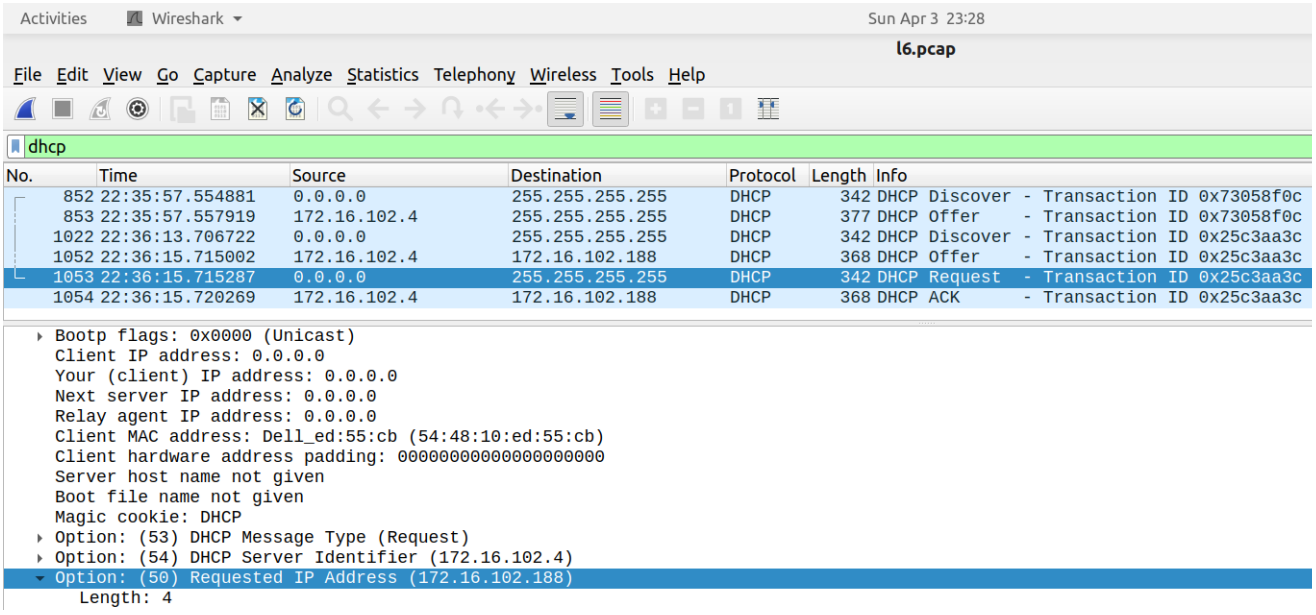
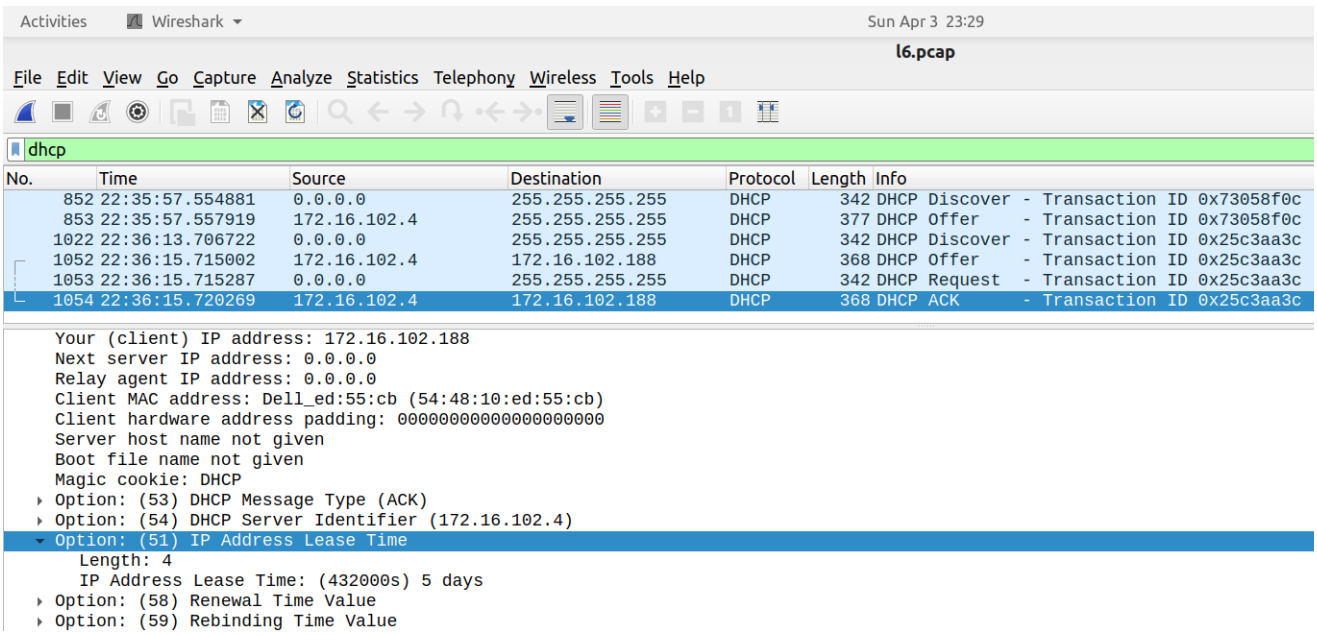
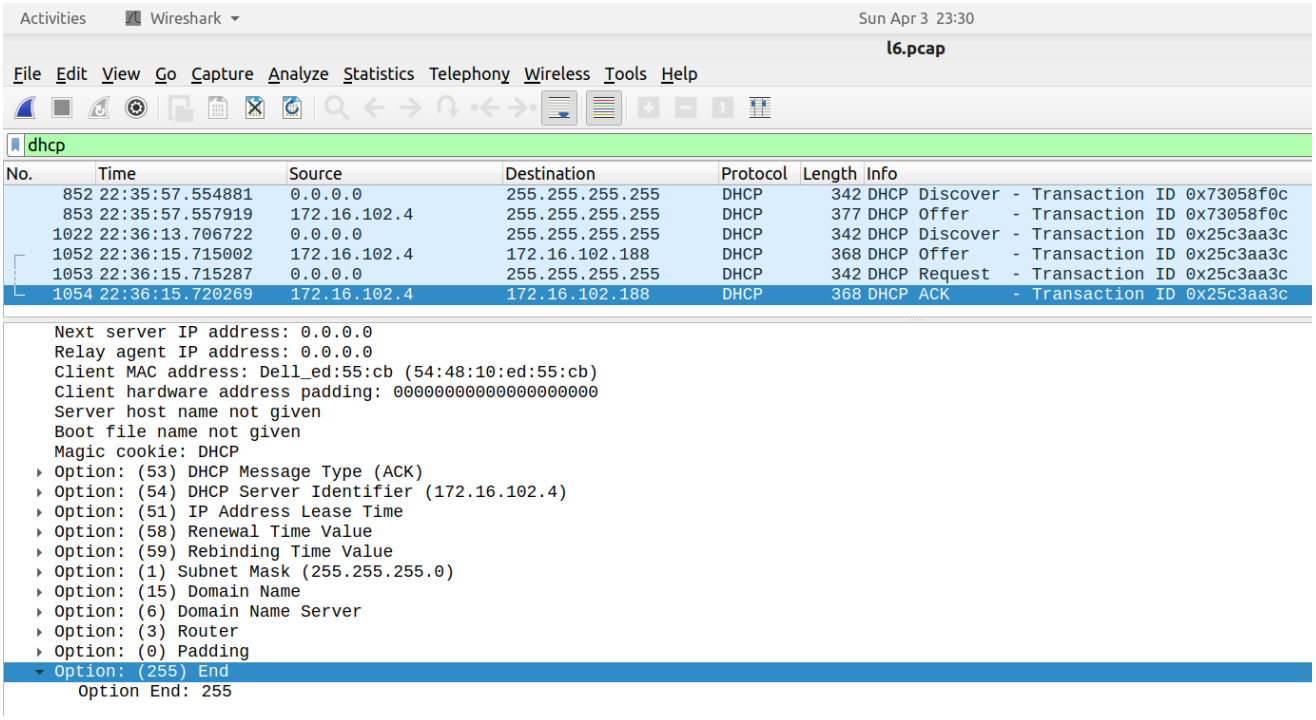
e. What option value stands for the Requested IP Address option? And for the IP Address Lease Time option?





The option value of 50 stands for Requested IP Address and the value of 51 stands for IP Address Lease Time.

f. How does the recipient of a DHCP message know that it has reached the last option?



By a DHCP option called End with value 255.

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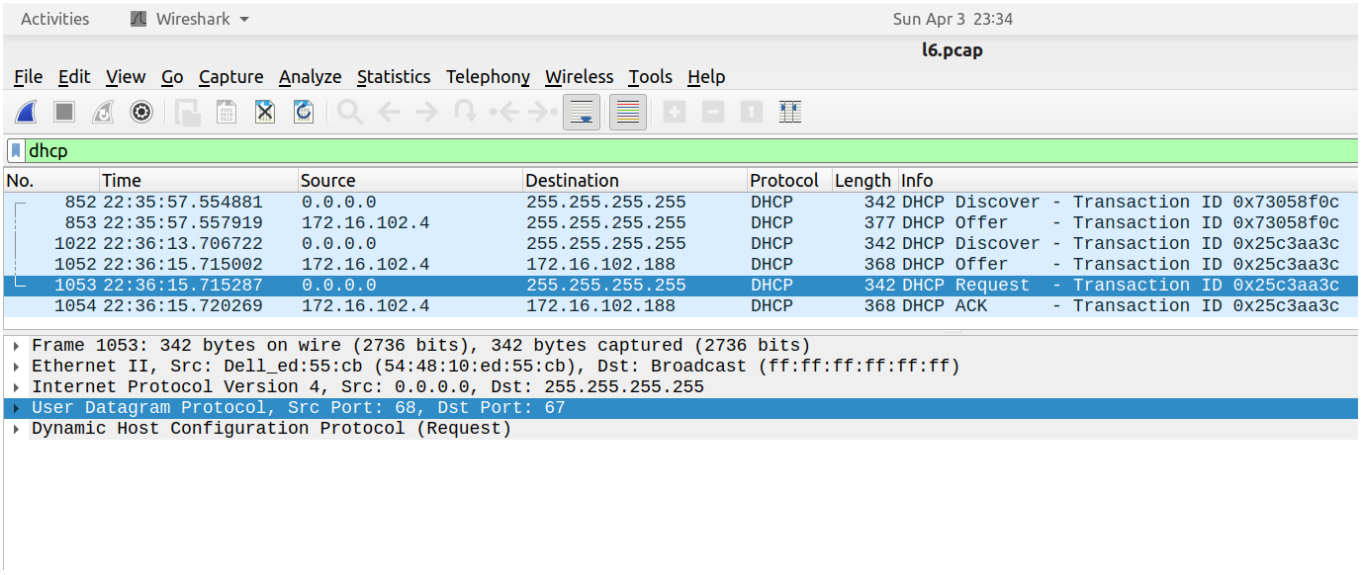
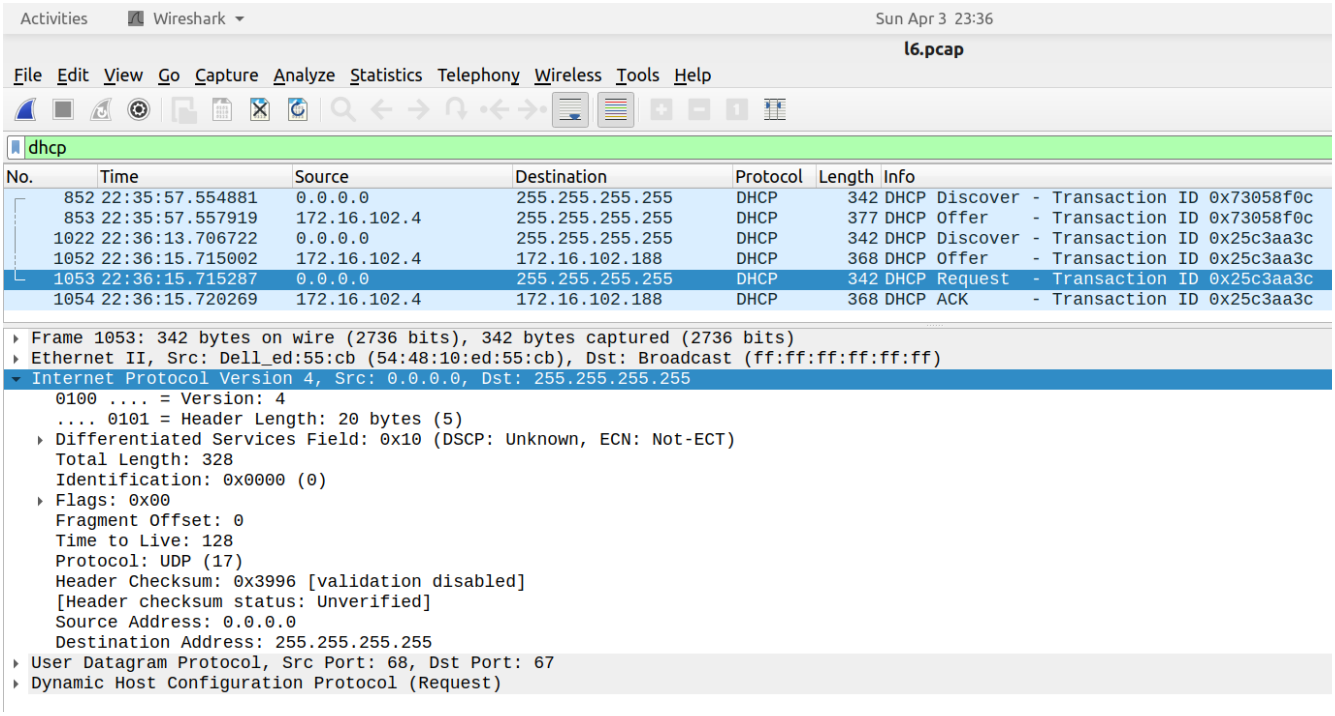
2. Answer the following questions by selecting a DHCP Request packet and looking at its UDP details in the middle Wireshark panel.

a. What port number does the DHCP client use, and what port number does the DHCP server use?



Source Port: 68

Destination Port: 67



b. What source IP address is put on the Request message? It is a special value meaning "this host on this network" used for initialization.

Source Address: 0.0.0.0

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c. What destination IP address is put on the Request message? It is also a reserved value designed to reach the DHCP server wherever it is on the local network.

Destination Address: 255.255.255.255

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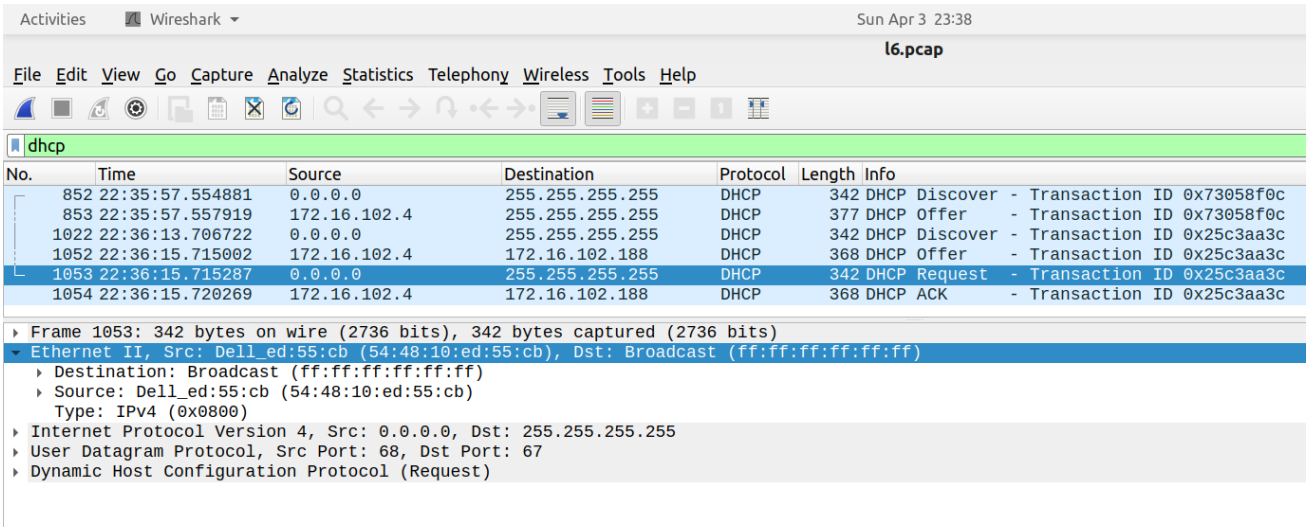
d. What source Ethernet address is put on the Request message, and what destination Ethernet address is put on the Request message? One of these addresses is a reserved address.



Source: Dell_ed:55:cb (54:48:10:ed:55:cb)

Destination: Broadcast (ff:ff:ff:ff:ff:ff)

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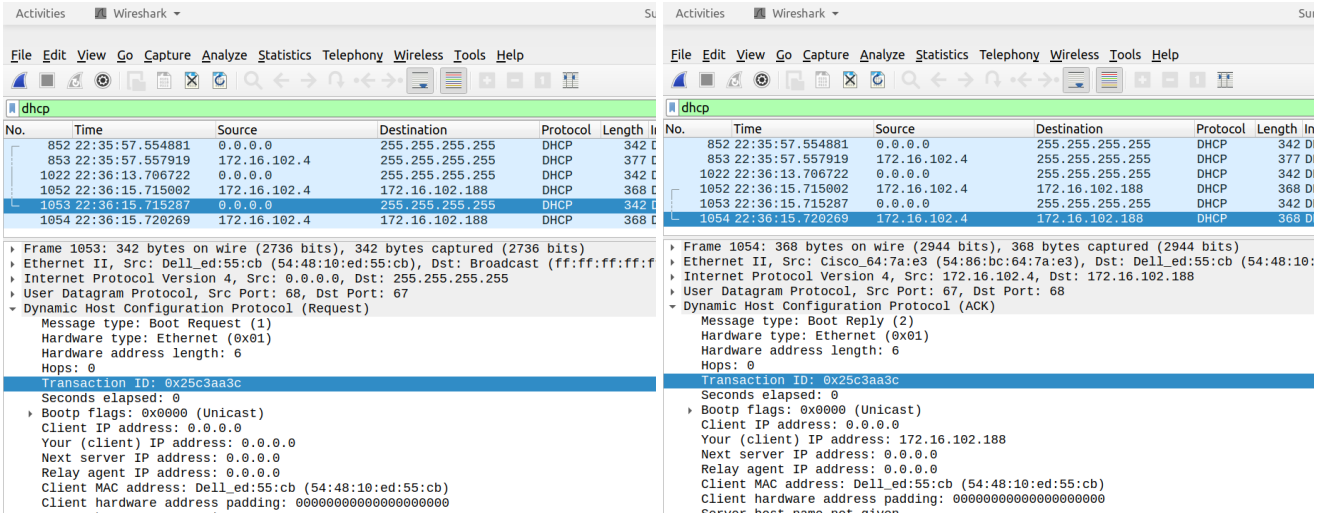
e. How does a computer work out whether a DHCP message it receives is intended as a reply to its DHCP Request message, and not a reply to another computer? Hint: If you are not sure then go over the fields you inspected previously.



The DHCP messages in a single exchange carry the same Transaction ID. Thus a computer looks for a DHCP reply such as an Ack with a Transaction ID that matches the value it placed on the earlier DHCP message such as a Request.
