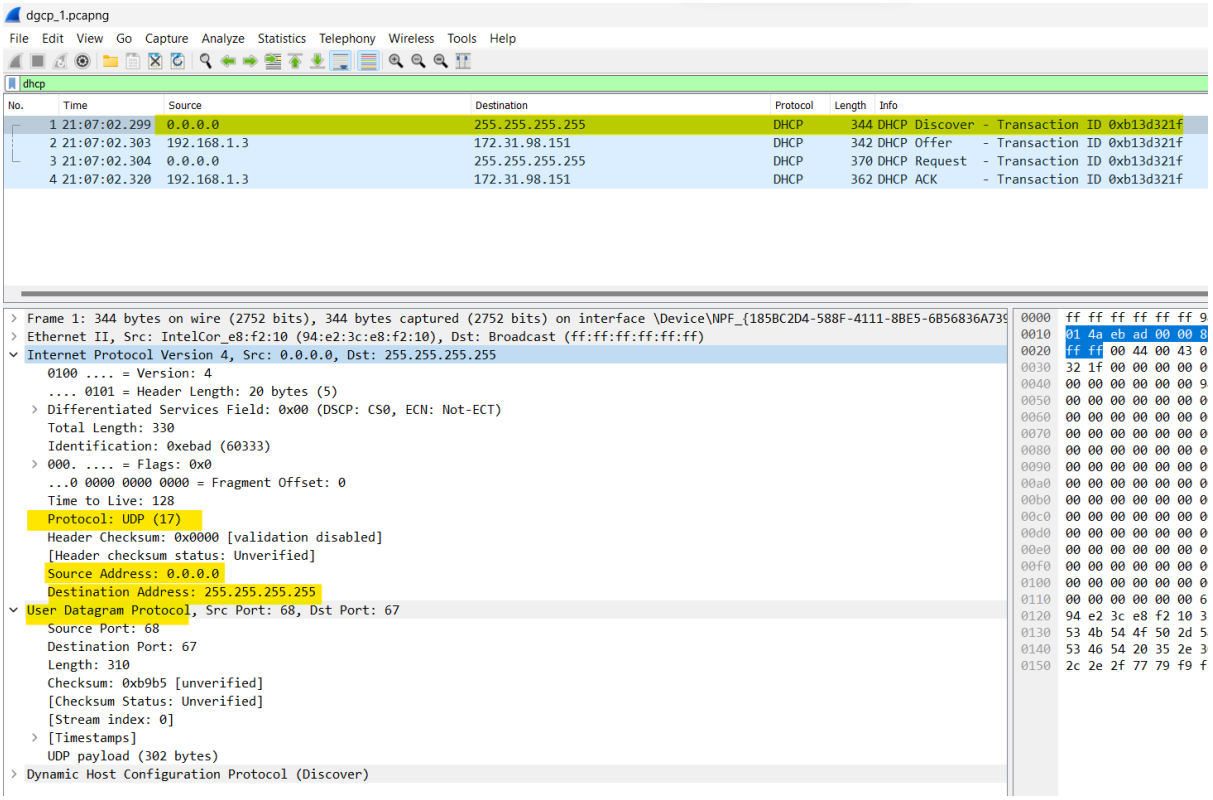
Lab 05_DHCP

DHCP DISCOVER

1. **Is this DHCP Discover message sent out using UDP or TCP as the underlying transport protocol?**

   This DHCP Discover message is sent via UDP



2. **What is the source IP address used in the IP datagram containing the Discover message? Is there anything special about this address? Explain.**

   source IP address: 0.0.0.0
   This address is known as the "unspecified address" and is special because This isn't really a valid IP address.
   This is because the host does not yet have an IP address assigned to it, and is broadcasting its request for an IP address to all DHCP servers on the network.

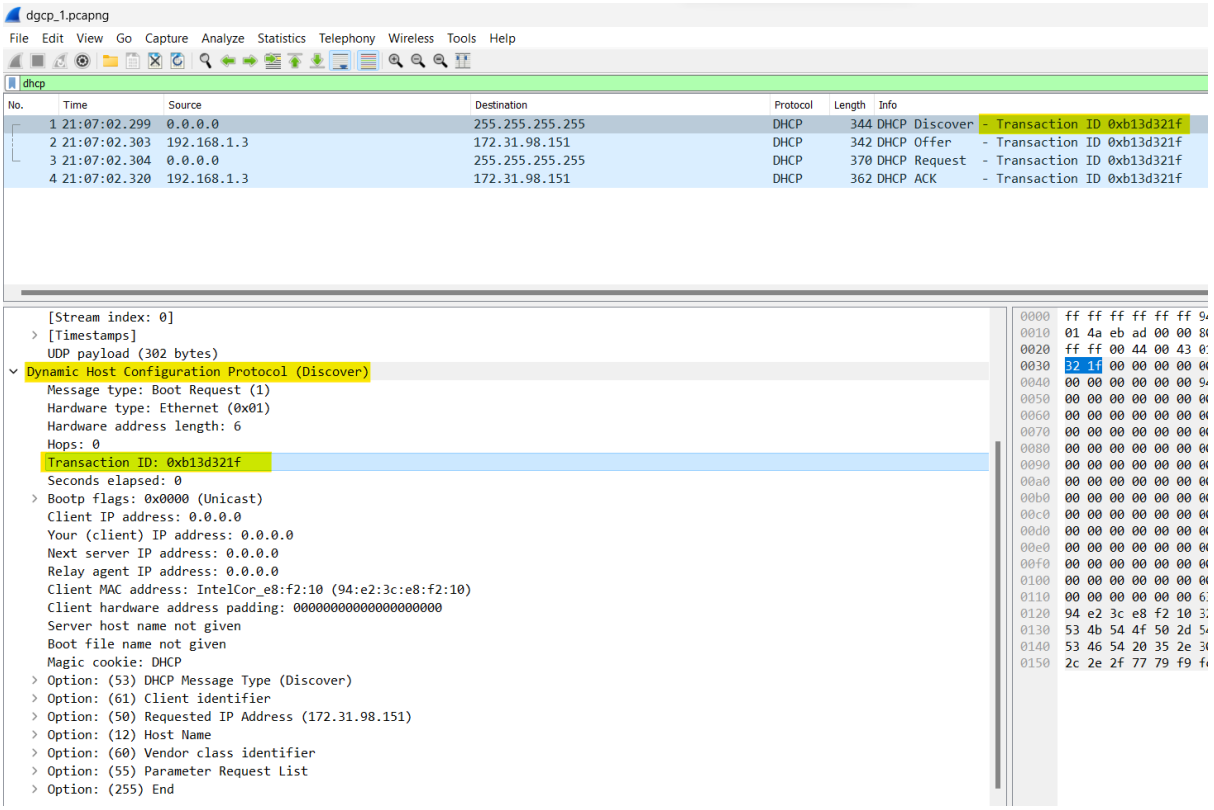
3. **What is the destination IP address used in the datagram containing the Discover message. Is there anything special about this address? Explain.**

   destination IP address: 255.255.255.255

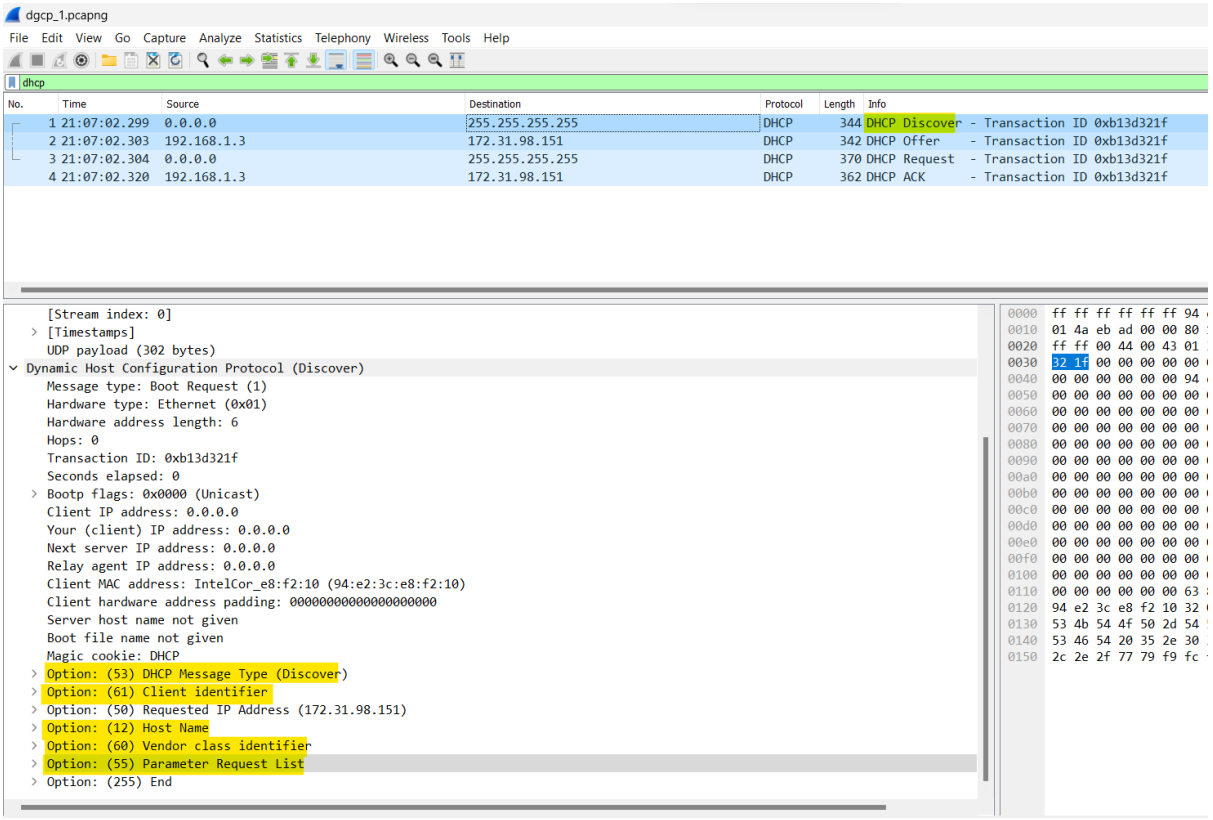
This is the broadcasting IP address, which means the message is sent to all devices on the network. The host uses this broadcast address to ensure that all DHCP servers on the network can receive the discover message and respond with an offer.

4. **What is the value in the transaction ID field of this DHCP Discover message?**

transaction ID: 0xb13d321f



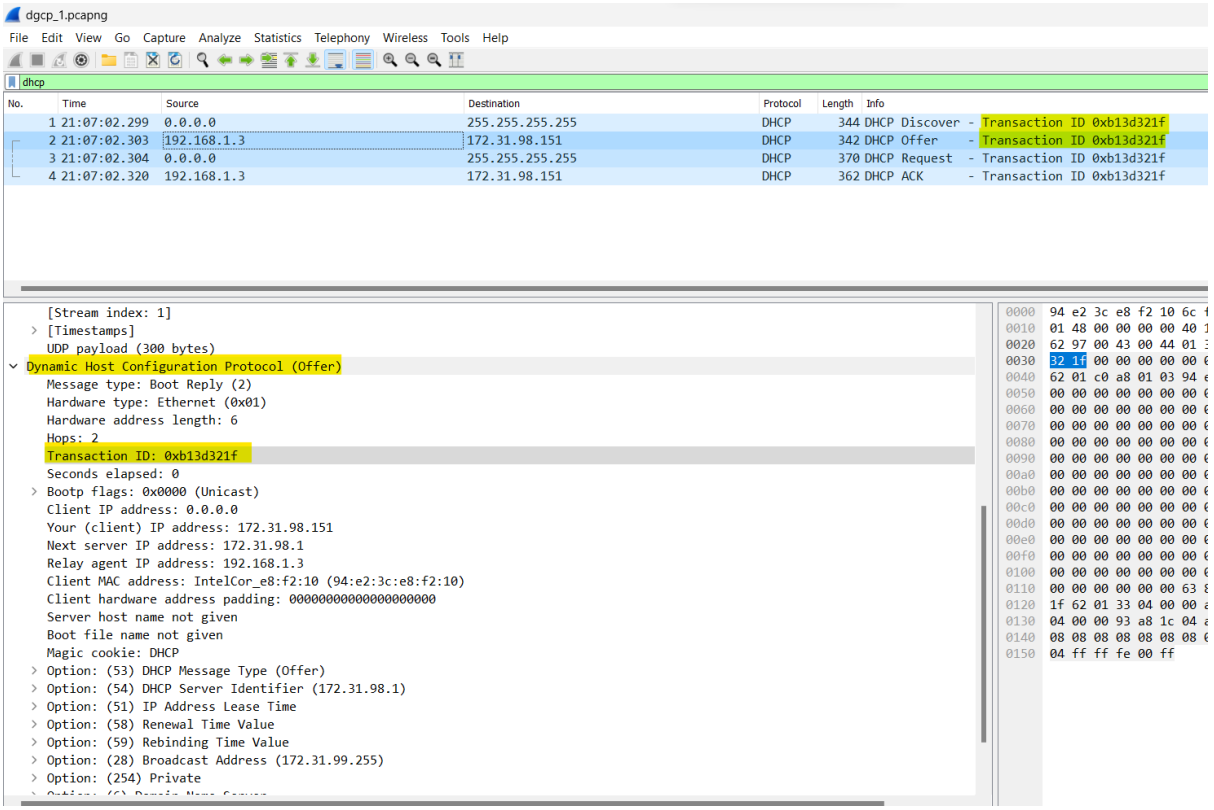
5. **Now inspect the options field in the DHCP Discover message. What are five pieces of information (beyond an IP address) that the client is suggesting or requesting to receive from the DHCP server as part of this DHCP transaction?**
five pieces of information (beyond an IP address):
   - DHCP Message Type (Discover)
   - Client identifier
   - Host Name
   - Vendor class identifier
   - Parameter Request List



DHCP OFFER

6. **How do you know that this Offer message is being sent in response to the DHCP Discover message you studied in questions 1-5 above?**

   Because it has the same transaction ID with the DHCP Discover message.



7. **What is the *source* IP address used in the IP datagram containing the Offer message? Is there anything special about this address? Explain.**

   source IP address: 192.168.1.3
   This is the IP address of the DHCP, where the server is running.
   The specific IP address will vary depending on the DHCP server's configuration and the network setup.

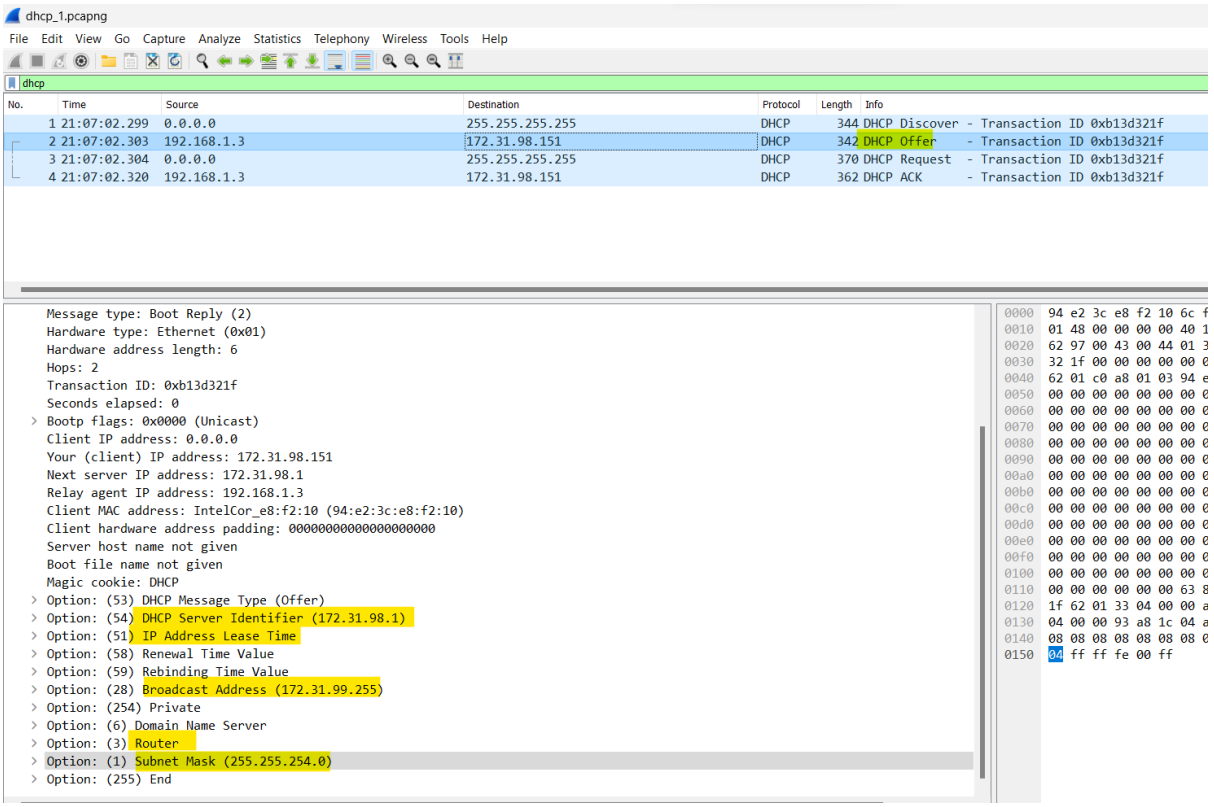
8. **What is the *destination* IP address used in the datagram containing the Offer message? Is there anything special about this address? Explain. [Hint: Look at your trace carefully. The answer to this question may differ from what you see in Figure 4.24 in the textbook. If you really want to dig into this, consult the DHCP RFC, page 24.]**

   destination IP address: 172.31.98.151
   This is the previous IP address of the client. The destination IP address used in the IP datagram containing the DHCP Offer message is the IP address of the client that sent the DHCP Discover message.
   The DHCP server sends the Offer message as a unicast packet directly to the requesting client's IP address. This ensures that only the intended client receives the offer and prevents other clients on the network from processing the message.

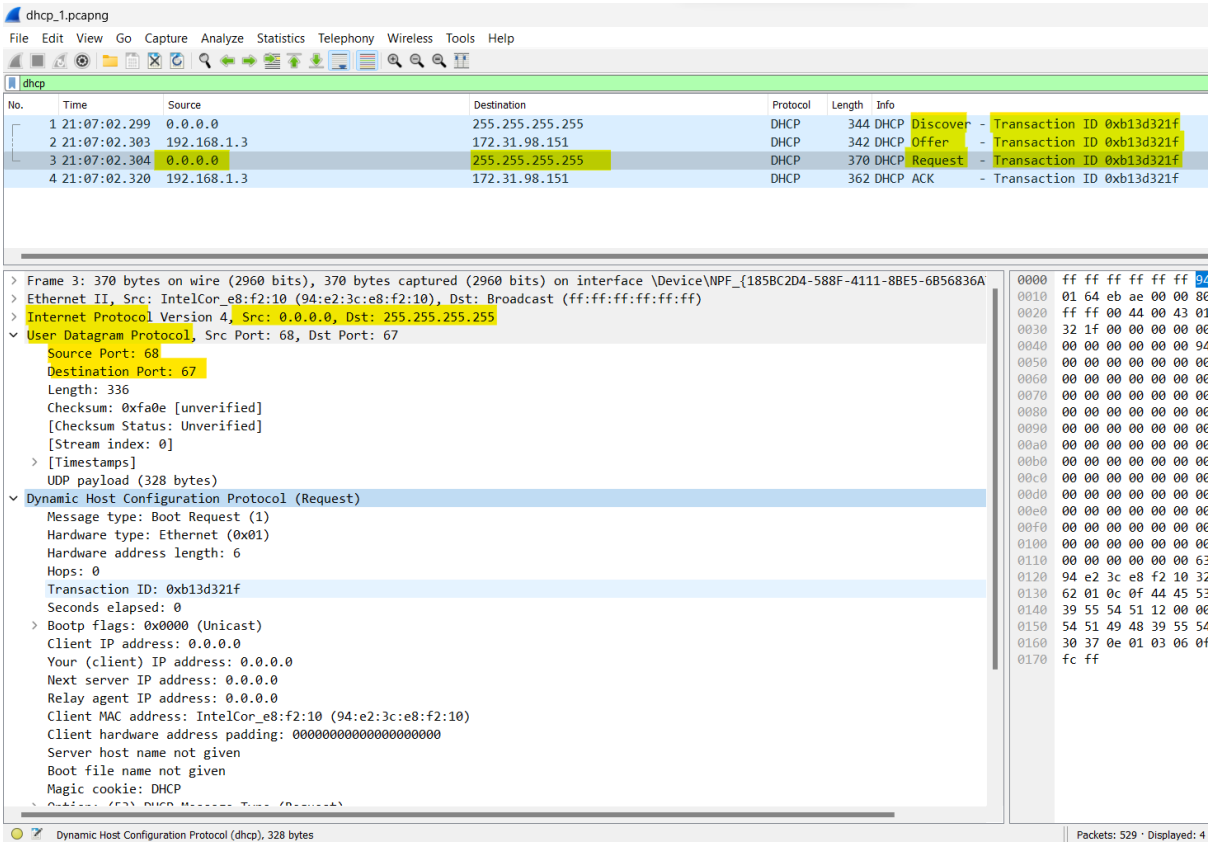
9. **Now inspect the options field in the DHCP Offer message. What are five pieces of information that the DHCP server is providing to the DHCP client in the DHCP Offer message?**

five pieces of information:

- DHCP Server identifier (172.31.98.1)
- IP Address Lease Time
- Broadcast Address (172.31.99.255)
- Router
- Subnet Mask (255.255.254.0)



DHCP REQUEST



10. What is the UDP source port number in the IP datagram containing the first DHCP Request message in your trace? What is the UDP destination port number being used?

UDP source port: 68
UDP destination port: 67

11. What is the source IP address in the IP datagram containing this Request message? Is there anything special about this address? Explain.

source IP address: 0.0.0.0
This address is known as the "unspecified address" and is special because This isn't really a valid IP address.
This is because the host does not yet have an IP address assigned to it, and is broadcasting its request for an IP address to all DHCP servers on the network.

12. What is the destination IP address used in the datagram containing this Request message. Is there anything special about this address? Explain.

destination IP address: 255.255.255.255
This is the broadcasting IP address, which means the message is sent to all devices on the network. The host uses this broadcast address to ensure that all DHCP servers on the network can receive the discover message and respond with an offer.

13. What is the value in the transaction ID field of this DHCP Request message? Does it match the transaction IDs of the earlier Discover and Offer messages?

transaction ID: 0xb13d321f
Yes.

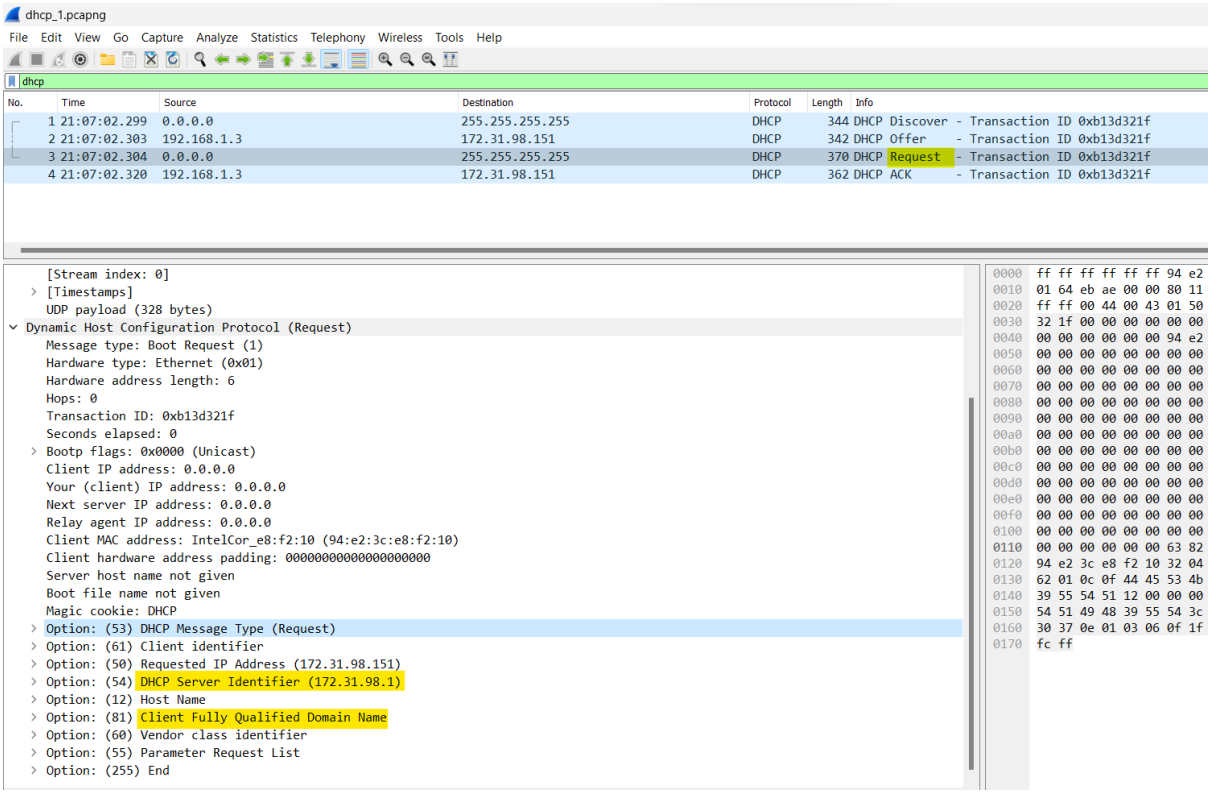
14. Now inspect the options field in the DHCP Discover message and take a close look at the "Parameter Request List". The DHCP RFC notes that

> **"The client can inform the server which configuration parameters the client is interested in by including the 'parameter request list' option. The data portion of this option explicitly lists the options requested by tag number."**

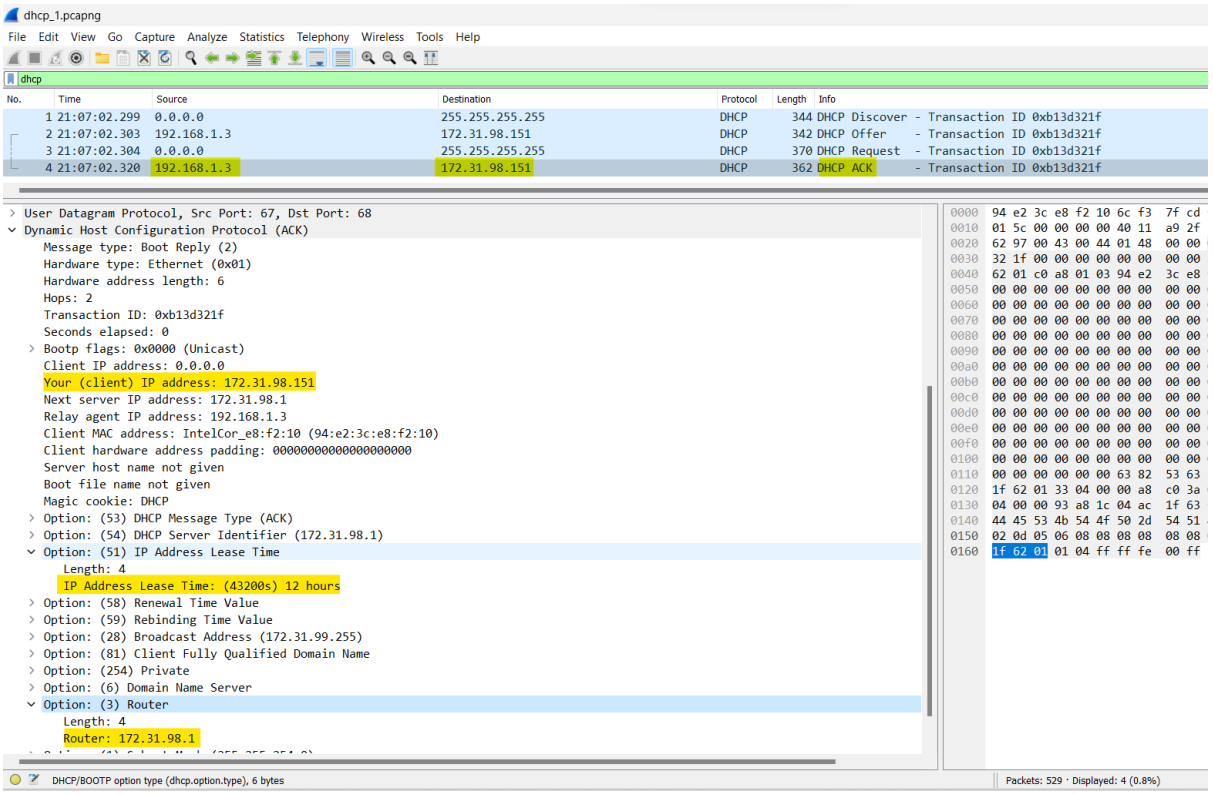
What differences do you see between the entries in the 'parameter request list' option in this Request message and the same list option in the earlier Discover message?

The differences between the entries in the 'parameter request list' option in this Request message and list option in the earlier Discover message are added 2 options:

- DHCP Server Identifier (172.31.98.151)
- Client Fully Qualified Domain Name



DHCP ACK



15. What is the source IP address in the IP datagram containing this ACK message? Is there anything special about this address? Explain.

source IP address: 192.168.1.3
This is the IP address of the DHCP, where the server is running.
The specific IP address will vary depending on the DHCP server's configuration and the network setup.

16. What is the destination IP address used in the datagram containing this ACK message. Is there anything special about this address? Explain.

destination IP address: 172.31.98.151
This is the previous IP address of the client. The destination IP address used in the IP datagram containing the DHCP Offer message is the IP address of the client that sent the DHCP Discover message.
The DHCP server sends the Offer message as a unicast packet directly to the requesting client's IP address. This ensures that only the intended client receives the offer and prevents other clients on the network from processing the message.

17. What is the name of the field in the DHCP ACK message (as indicated in the Wireshark window) that contains the assigned client IP address?

The field in the DHCP ACK message that contains the assigned client IP address is called "Your (client) IP address".

18. **For how long a time (the so-called “lease time”) has the DHPC server assigned this IP address to the client?**

    IP Address Lease Time: (43200s) 12 hours

19. **What is the IP address (returned by the DHCP server to the DHCP client in this DHCP ACK message) of the first-hop router on the default path from the client to the rest of the Internet?**

    IP Address Router: 172.31.98.1