NAME – AARSH BHAVSAR

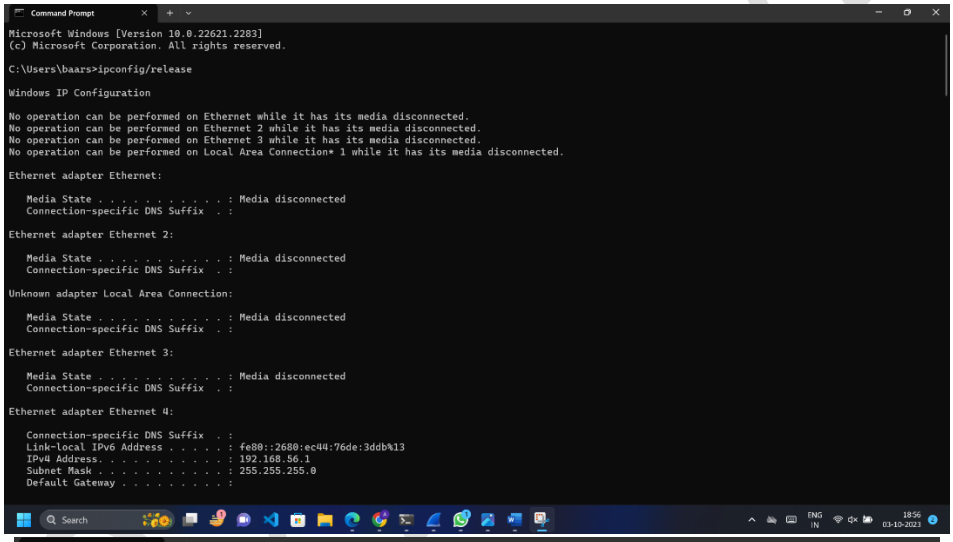
STUDENT ID – 202101474

LAB – 6

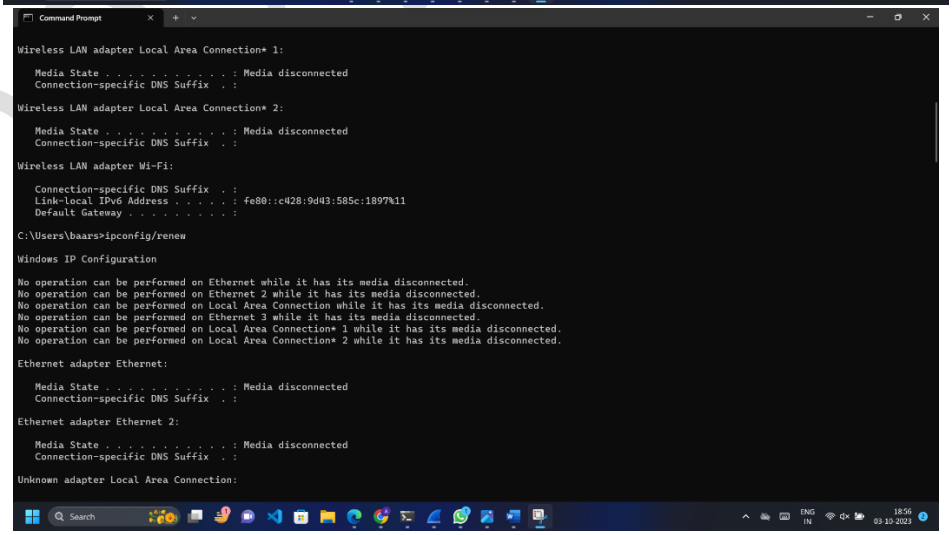
UNDERSTANDING OF DHCP USING WIRESHARK AND PACKET TRACER

GROUP – 6

Exercise 02: Command Window Screenshots: -



```
Command Prompt
Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

C:\Users\baars>ipconfig/release

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Ethernet 2 while it has its media disconnected.
No operation can be performed on Ethernet 3 while it has its media disconnected.
No operation can be performed on Local Area Connection* 1 while it has its media disconnected.

Ethernet adapter Ethernet:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 2:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Unknown adapter Local Area Connection:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 3:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 4:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::2680:ec44:76de:3ddb%13
   IPv4 Address. . . . . : 192.168.56.1
   Subnet Mask . . . . . : 255.255.255.0
   Default Gateway . . . . . :
```



```
Command Prompt

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::c428:9d43:585c:1897%11
   Default Gateway . . . . . :

C:\Users\baars>ipconfig/renew

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Ethernet 2 while it has its media disconnected.
No operation can be performed on Local Area Connection while it has its media disconnected.
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Ethernet adapter Ethernet 2:

   Media State . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Unknown adapter Local Area Connection:
```

```
Command Prompt

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 3:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 4:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::2680:ec44:76de:3ddb%13
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : DAIICT.AC.IN
   Link-local IPv6 Address . . . . . : fe80::c428:9d43:585c:1897%11
   IPv4 Address. . . . . . . . . . . : 10.200.28.75
   Subnet Mask . . . . . . . . . . . : 255.255.224.0
   Default Gateway . . . . . . . . . : 10.200.0.4

C:\Users\baars>ipconfig/renew

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
```

```
Command Prompt

No operation can be performed on Ethernet while it has its media disconnected.
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   Connection-specific DNS Suffix  . :

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   Connection-specific DNS Suffix  . :

Unknown adapter Local Area Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 3:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 4:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::2680:ec44:76de:3ddb%13
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
```

```
Command Prompt

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : DAIICT.AC.IN
   Link-local IPv6 Address . . . . . : fe80::c428:9d43:585c:1897%11
   IPv4 Address. . . . . . . . . . . : 10.200.28.75
   Subnet Mask . . . . . . . . . . . : 255.255.224.0
   Default Gateway . . . . . . . . . : 10.200.0.4

C:\Users\baars>ipconfig/release

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
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   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Unknown adapter Local Area Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 3:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet 4:

   Connection-specific DNS Suffix  . :
```
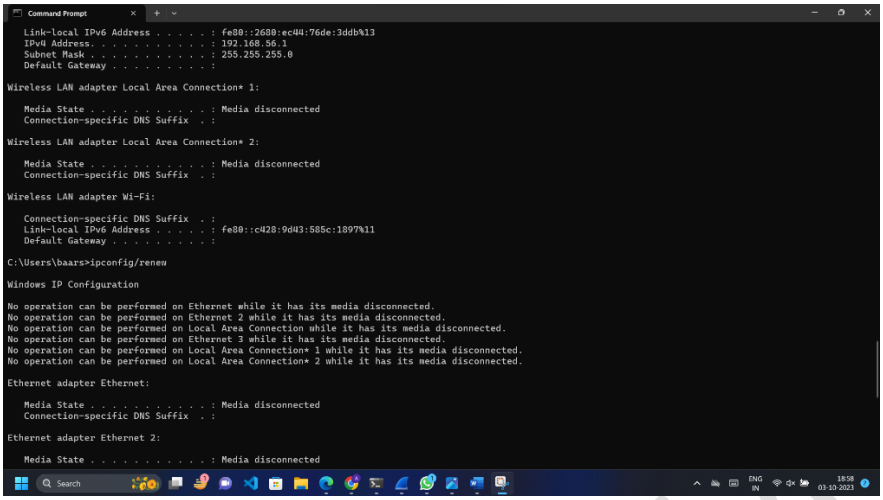
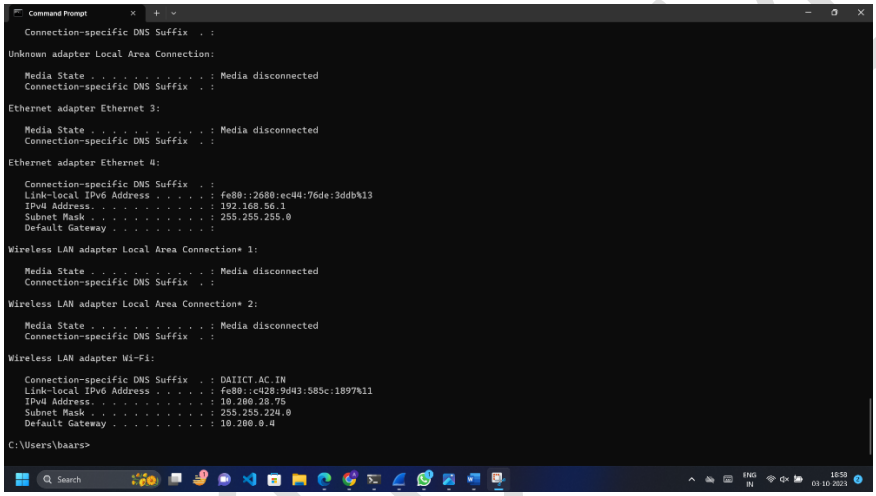
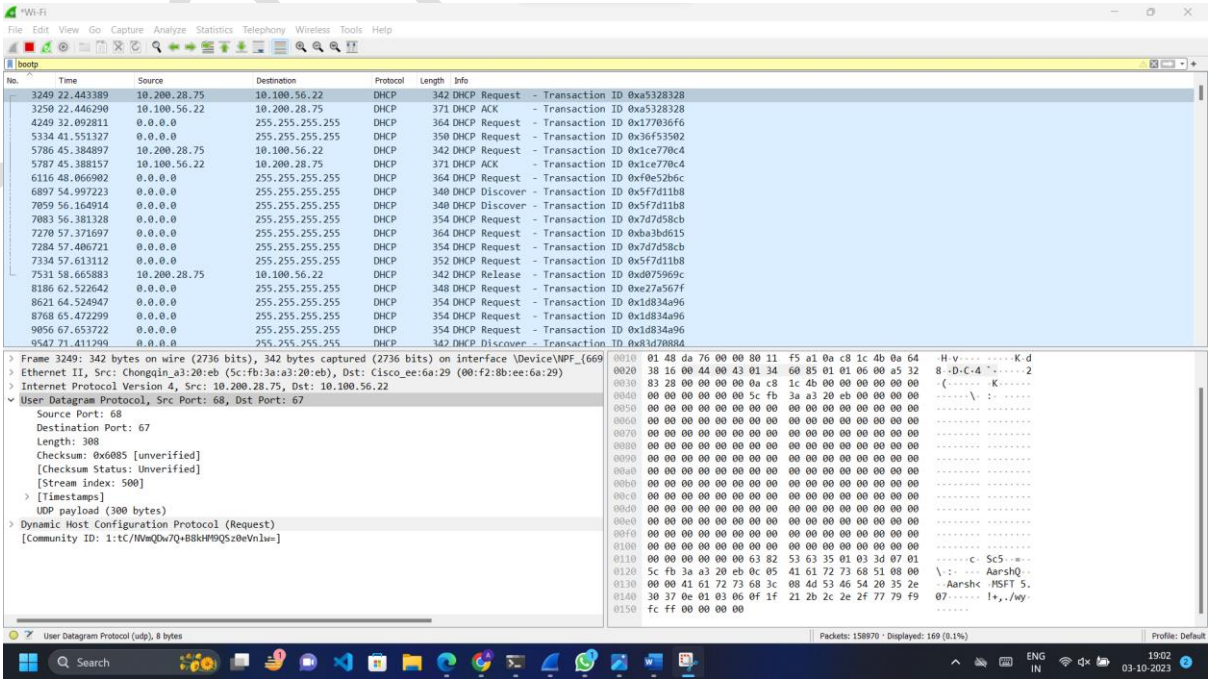



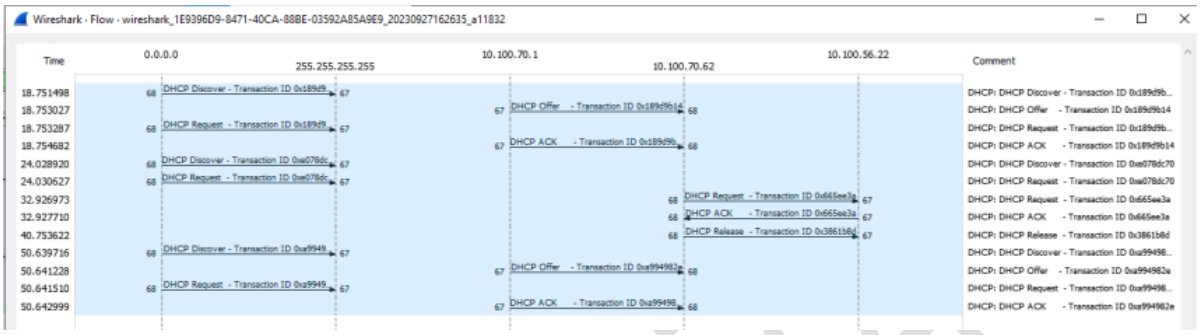


1. Are DHCP messages sent over UDP or TCP?



DHCP messages are sent over UDP.

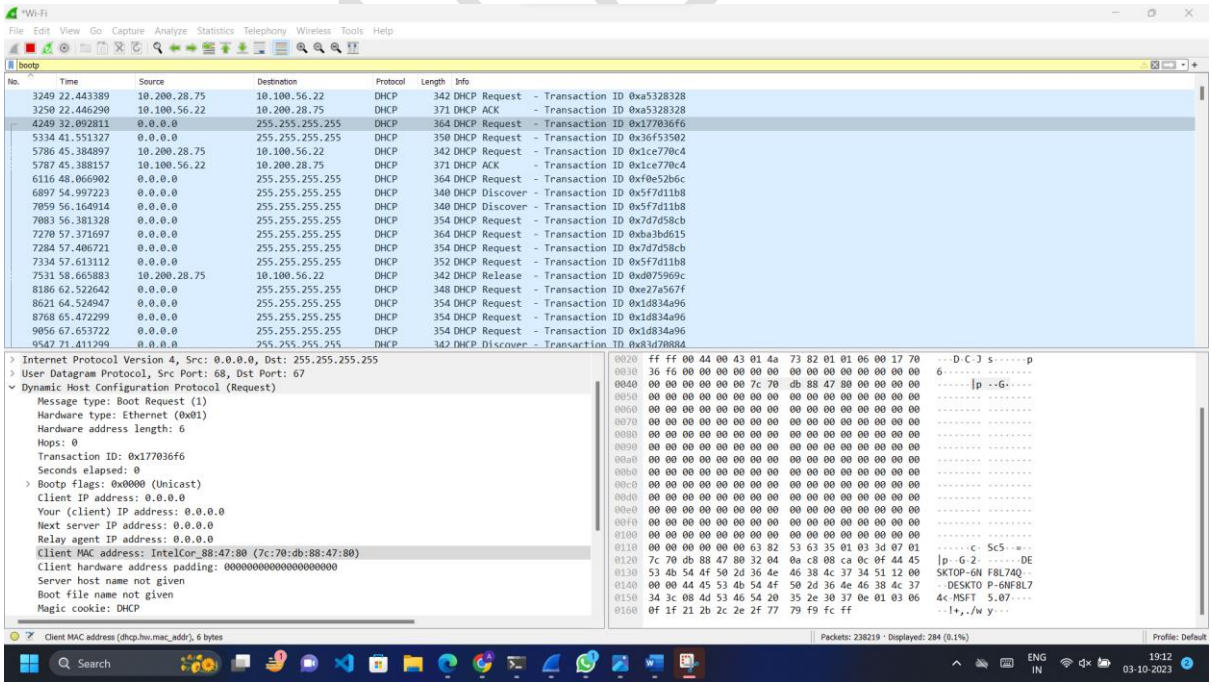
2. **Draw a timing datagram illustrating the sequence of the first four-packet Discover/Offer/Request/ACK DHCP exchange between the client and server. For each packet, indicate the source and destination port numbers. Are the port numbers the same as in the example given in this lab assignment?**



1) **SRC – 68, DST – 67**
2) **DST – 67, SRC – 68**
3) **SRC – 68, DST – 67**
4) **DST – 67, SRC – 68**

Yes, the port numbers are the same.

3. **What is the link-layer (eg., Ethernet) address of your host?**

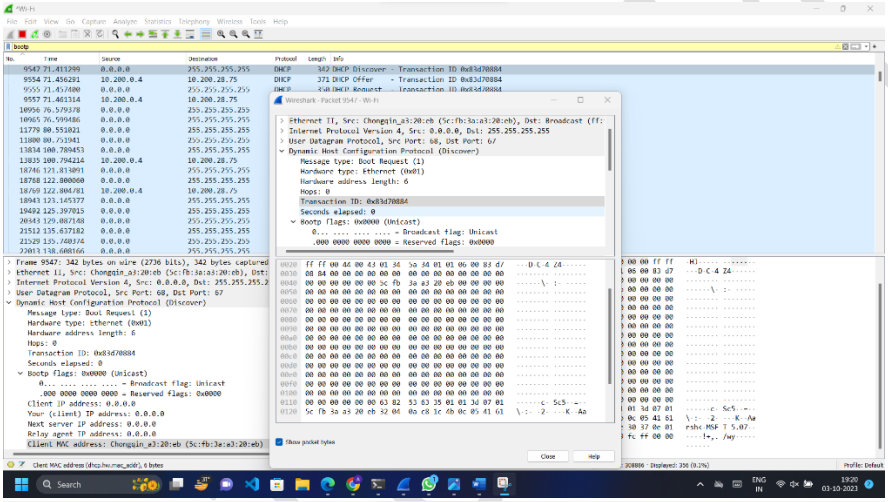


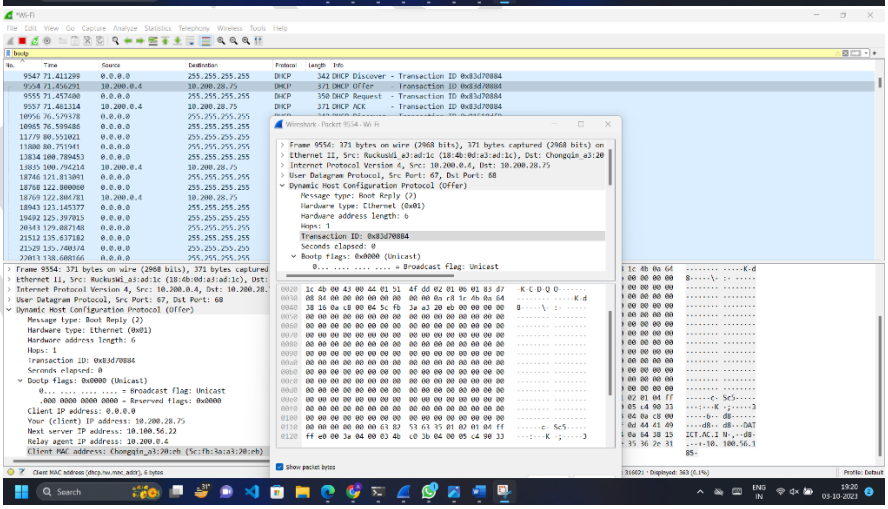
Link-Layer-Address – 7c:7:db:88:47:80

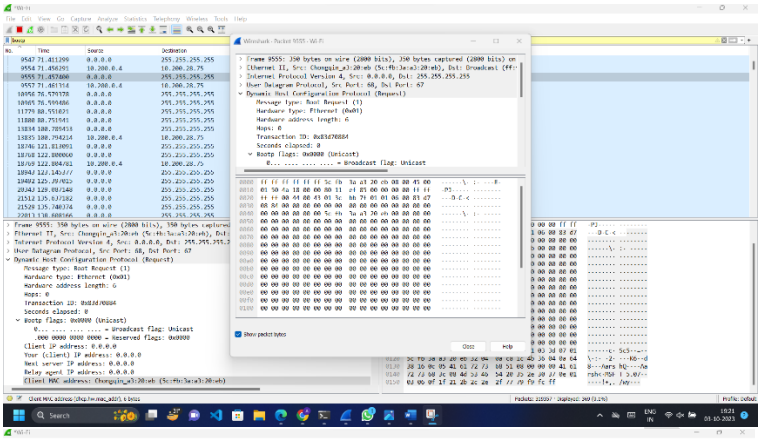
4. **What values in the DHCP discover message differentiate this message from the DHCP request message?**

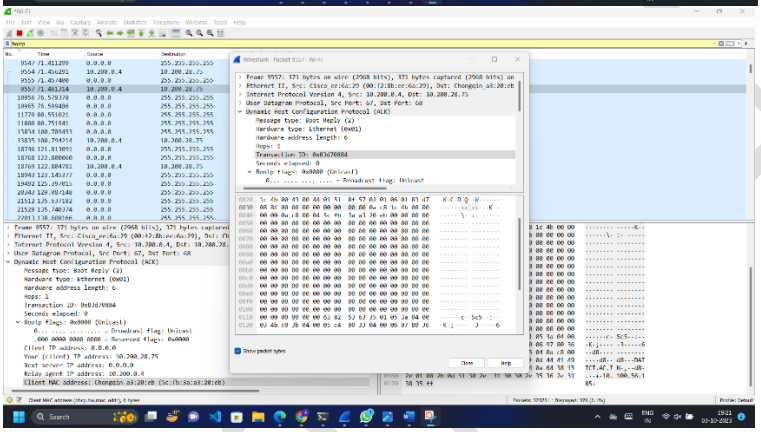
The values which differentiate the discovered message from the request message are in “Option 53: DHCP Message Type”. Also, DHCP Message Type Request includes a client domain name field. And, Discover contains a request IP address field.

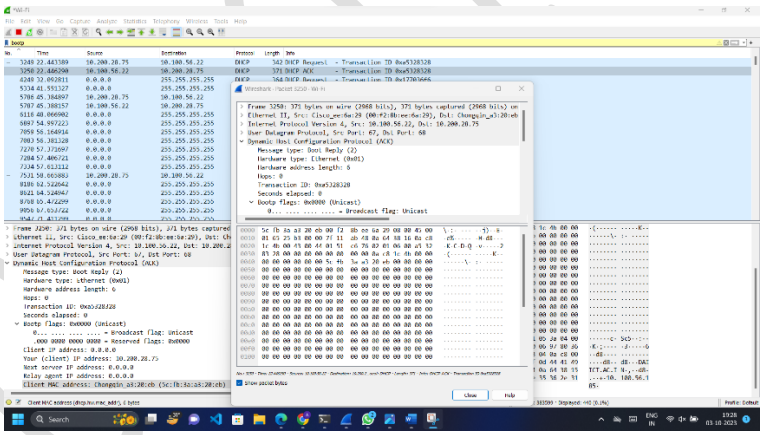
5. **What is the value of the Transaction-ID in each of the first four (Discover/Offer/Request/ACK) DHCP messages? What are the values of the Transaction-ID in the second set (Request/ACK) set of DHCP messages? What is the purpose of the Transaction-ID field?**











Discover – Transaction ID - 0x83d70884 (First Set)

Offer – Transaction ID - 0x83d70884 (First Set)

Request – Transaction ID - 0x83d70884 (First Set)

ACK – Transaction ID - 0x83d70884 (First Set)

Request -Transaction ID - 0xa5328328 (Second Set)

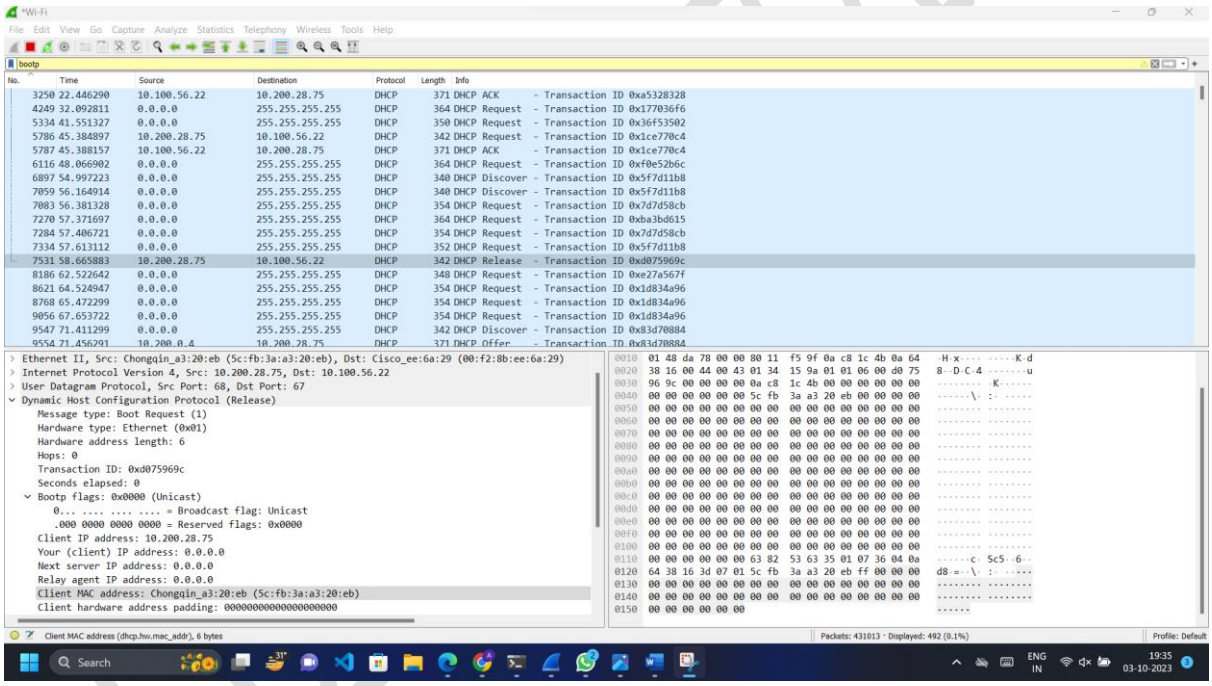
ACK -Transaction ID - 0xa5328328 (Second Set)

Transaction ID, a random number chosen by the client, used by the client and server to associate messages and responses between a client and a server.

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.**

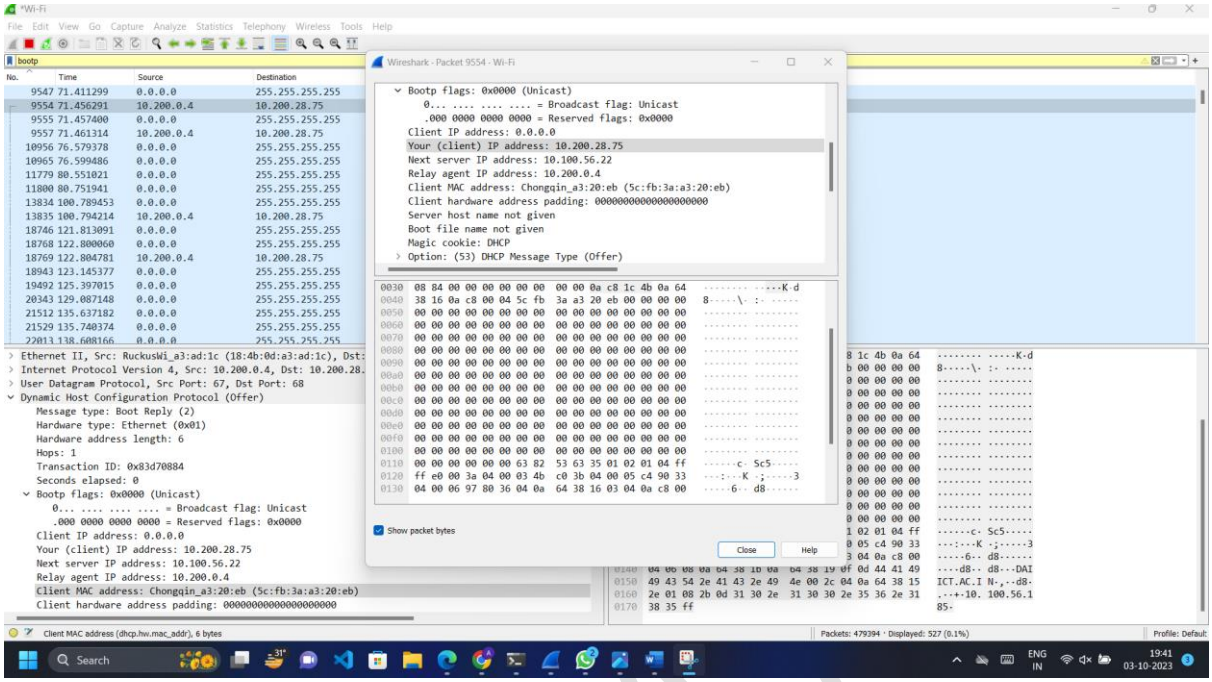
9547	71.411299	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x83d70884
9554	71.456291	10.200.0.4	10.200.28.75	DHCP	371	DHCP Offer - Transaction ID 0x83d70884
9555	71.457400	0.0.0.0	255.255.255.255	DHCP	350	DHCP Request - Transaction ID 0x83d70884
9557	71.461314	10.200.0.4	10.200.28.75	DHCP	371	DHCP ACK - Transaction ID 0x83d70884

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



IP address of the DHCP server: 10.200.28.75

8. **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.**

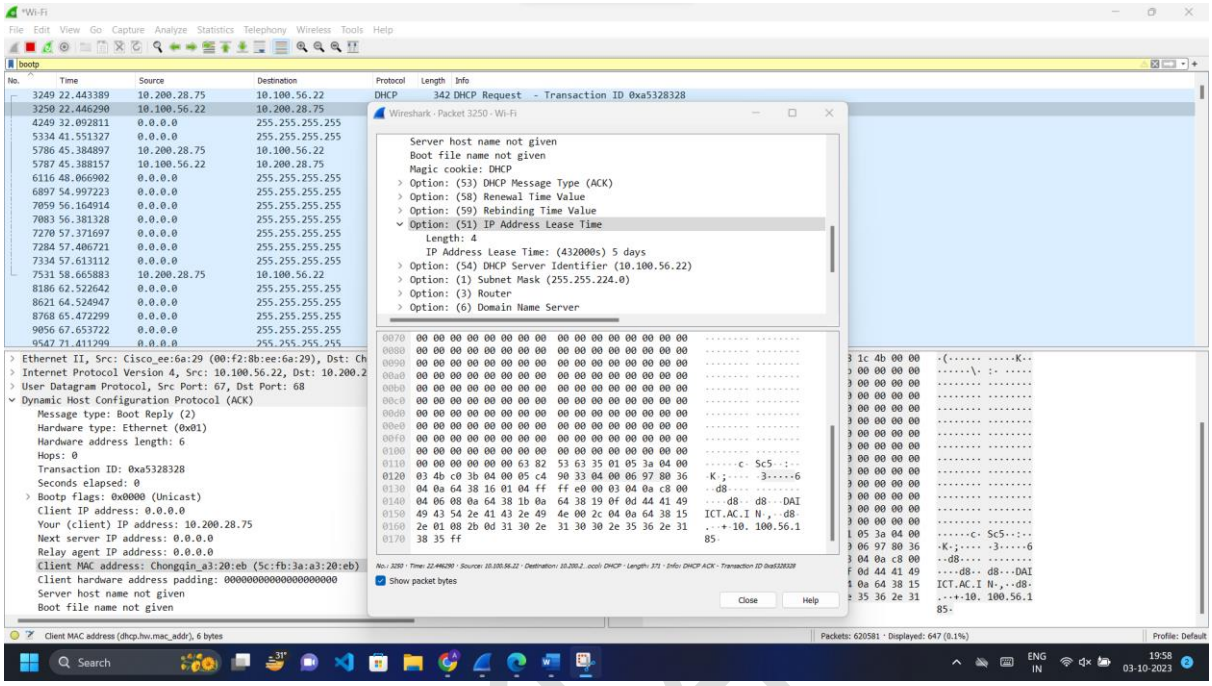


The DHCP server offered the IP address **10.200.28.75** to my client machine. The DHCP message with DHCP Message Type DHCP Offer contained the offered IP.

9. **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?**
   Since the IP is 0.0.0.0 it is telling us that there is no relay agent. If there were an IP there then we could give values in the trace.
10. **Explain the purpose of the router and subnet mask lines in the DHCP offer message.**
    The purpose of the router and subnet mask lines is to show us the default gateway

11. **In the example screenshots in this assignment, the host requests the offered IP address in the DHCP Request message. What happens in your own experiment?**
    In my experiment, the host requests the offered IP address in the DHCP Request message

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

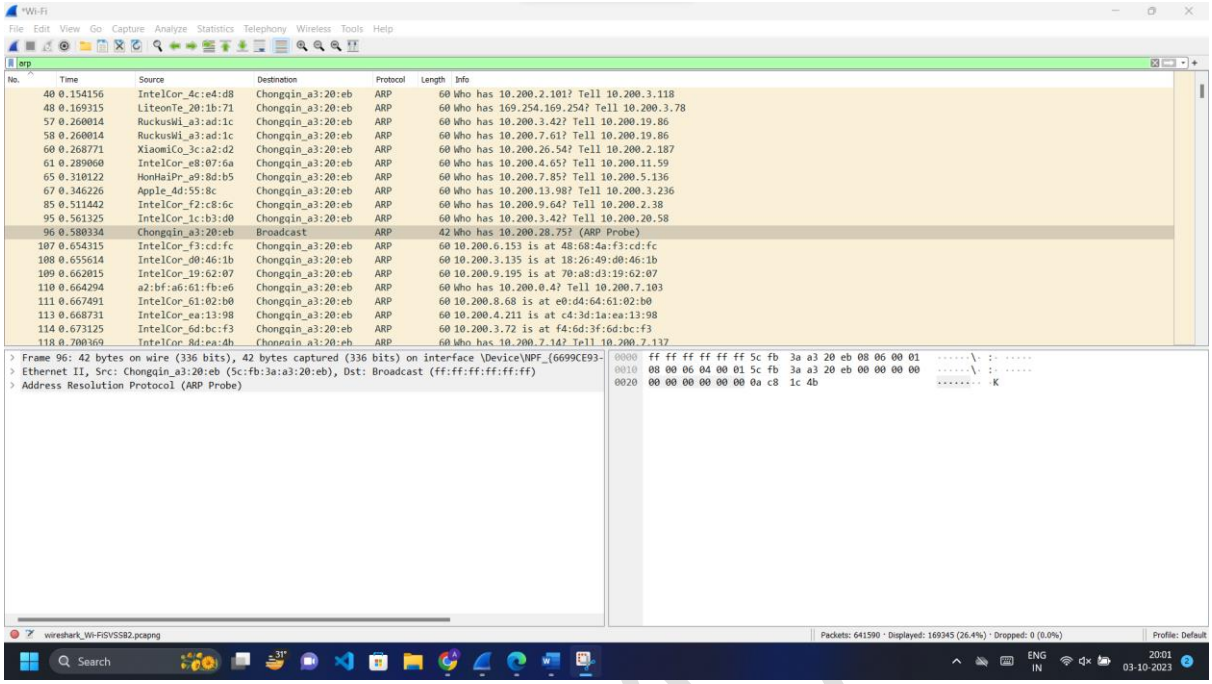


It is the amount of time the user is allowed to use the connection.

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

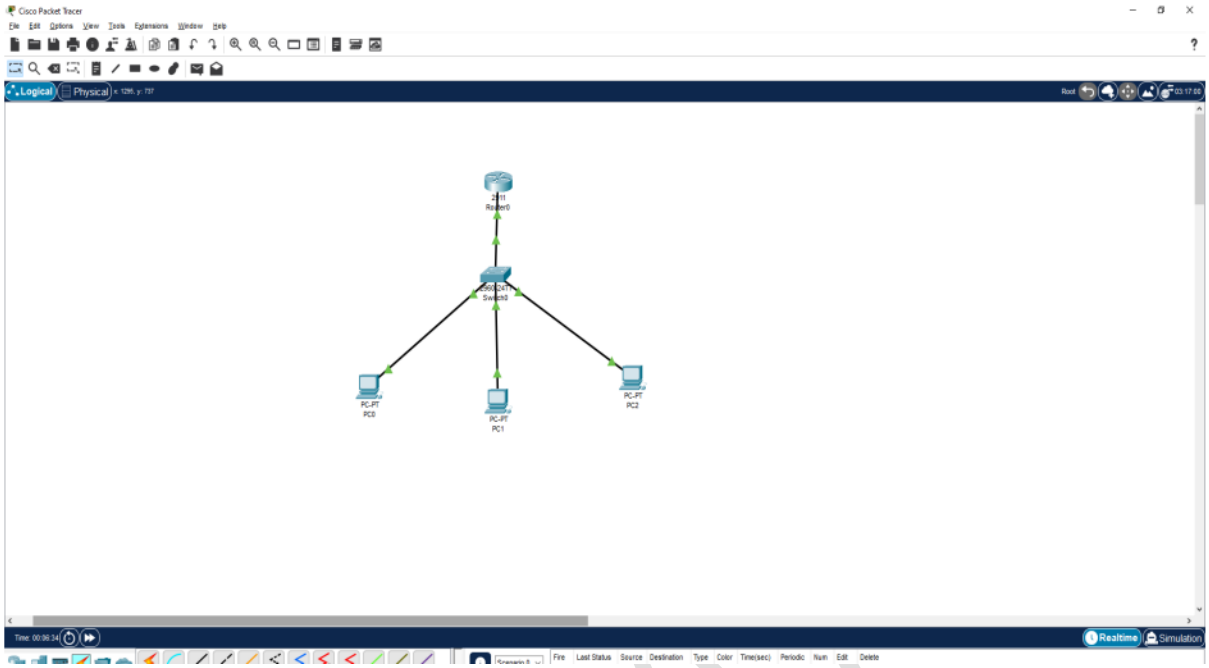
The DHCP release message ends the user's lease. Yes, it does issue an acknowledgment of receipt and if its lost it will just continue to run until the lease expires

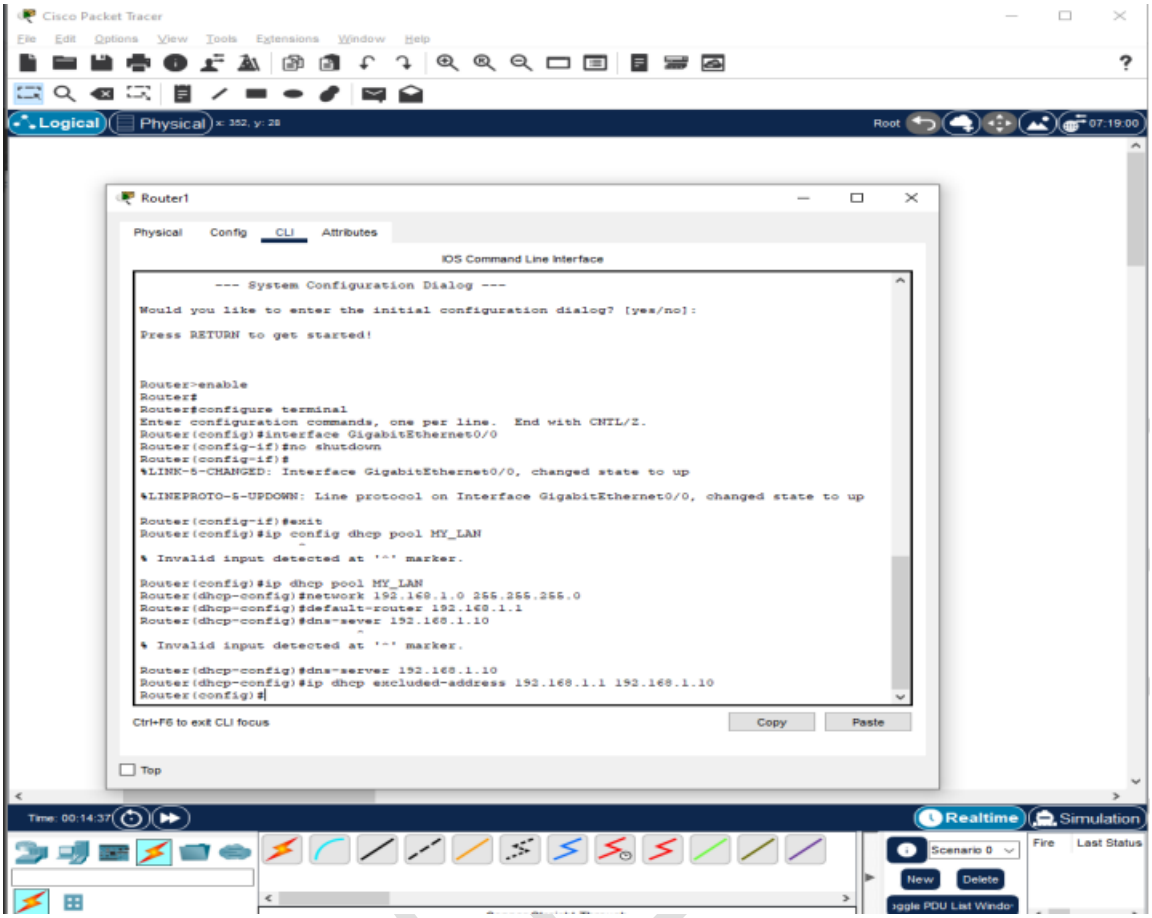
14. Clear the bootp filter from your Wireshark window. Were any ARP packets sent or received during the DHCP packet-exchange period? If so, explain the purpose of those ARP packets.

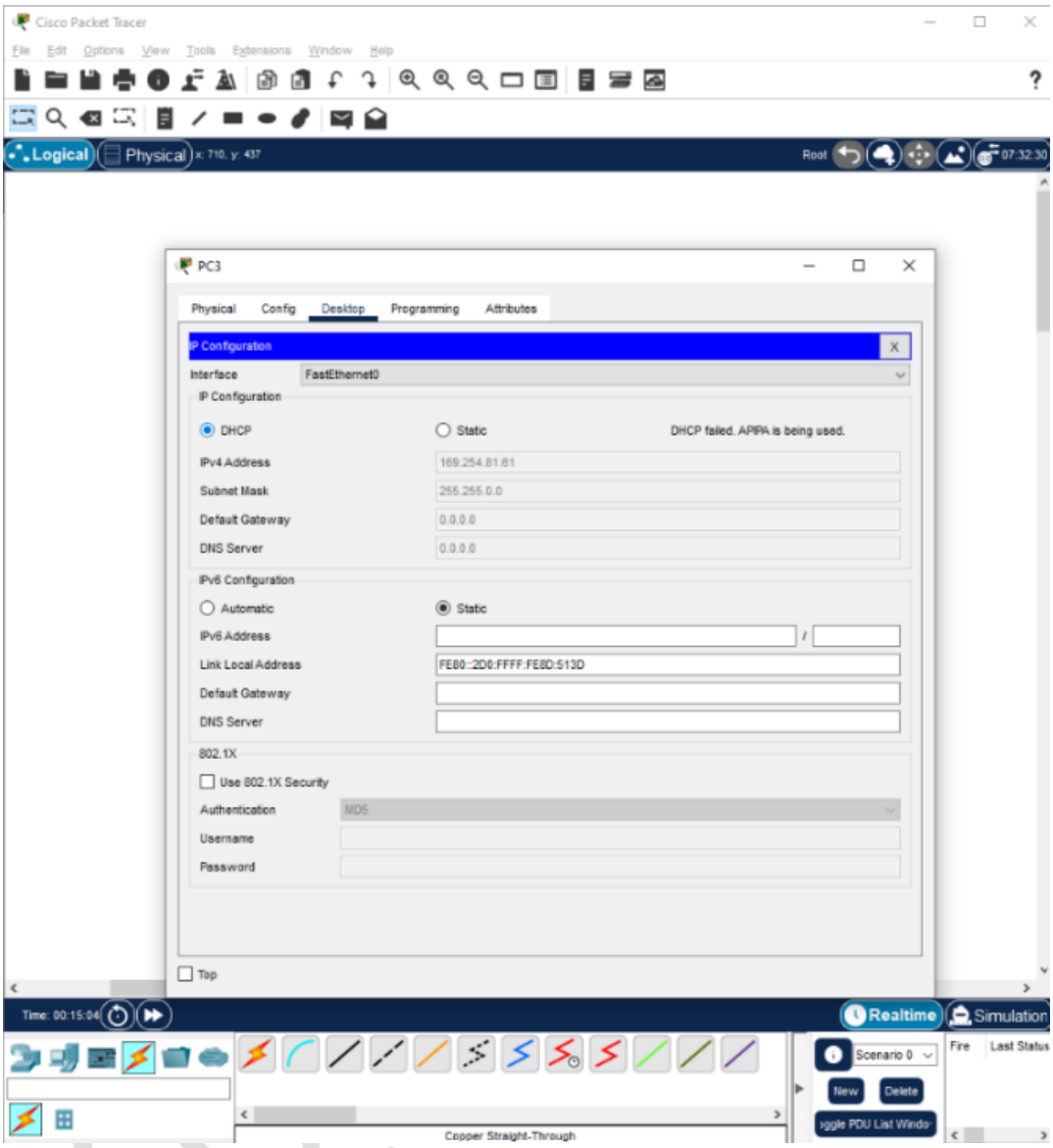


The ARP packets that show up are there in order to help sort out the MAC and IP addresses

Experiment2: Implementing DHCP server in a router




Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
07:19:00
Router1
Physical Config CLI Attributes
IOS Command Line Interface
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
Press RETURN to get started!
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#ip config dhcp pool MY_LAN
% Invalid input detected at '^' marker.
Router(config)#ip dhcp pool MY_LAN
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#dns-sever 192.168.1.10
% Invalid input detected at '^' marker.
Router(dhcp-config)#dns-server 192.168.1.10
Router(dhcp-config)#ip dhcp excluded-address 192.168.1.1 192.168.1.10
Router(config)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Time: 00:14:37
Realtime
Simulation
Scenario 0
New
Delete
Fire
Last Status


Cisco Packet Tracer
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
PC3
Physical Config Desktop Programming Attributes
IP Configuration
Interface FastEthernet0
IP Configuration
DHCP
Static
DHCP failed. APIPA is being used.
IPv4 Address 169.254.81.61
Subnet Mask 255.255.0.0
Default Gateway 0.0.0.0
DNS Server 0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address FE80::2D0:FFFF:FE8D:513D
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication MD5
Username
Password
Top
Realtime
Simulation
Scenario 0
New
Delete
Fire
Last Status
Copper Straight-Through