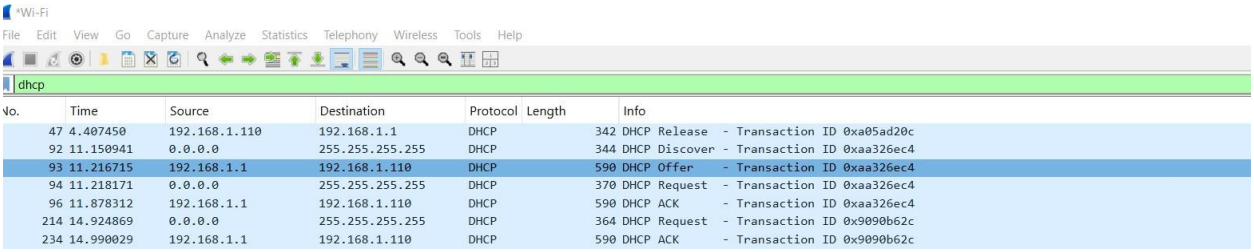
Yousef sameh fathi shoman

22p0010

Lab 7

```
C:\Users\youse>ipconfig /release

Windows IP Configuration

No operation can be performed on Local Area Connection* 9 while it has its media disconnected.
No operation can be performed on Ethernet while it has its media disconnected.

Ethernet adapter Ethernet 2:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3b7b:e89d:c08b:910%2
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 9:

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

Wireless LAN adapter Local Area Connection* 10:

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

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::2a6e:5716:add:e14a%18
   Default Gateway . . . . . . . . . :

Ethernet adapter Ethernet:

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

```
Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 9 while it has its media disconnected.
No operation can be performed on Local Area Connection* 10 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter Ethernet:

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

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::ede3:bb95:3a6b:f004%12
   Autoconfiguration IPv4 Address. . : 169.254.107.25
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 9:

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

Wireless LAN adapter Local Area Connection* 10:

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

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::fb90:fb2f:18ab:ae06%3
   IPv4 Address. . . . . . . . . . . : 192.168.1.110
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection:

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



1. Transport protocol used by DHCP Discover?

Underlying transport protocol:

The DHCP Discover packet is transmitted using **UDP**, not TCP.

2. Source IP address of the Discover message? Why special?

Source IP address of the Discover message:

The source IP address is **0.0.0.0**.

This address is used by a device that has not yet obtained an IP address, allowing it to communicate on the local network during the DHCP initialization phase.

3. Destination IP address of the Discover message? Why special?

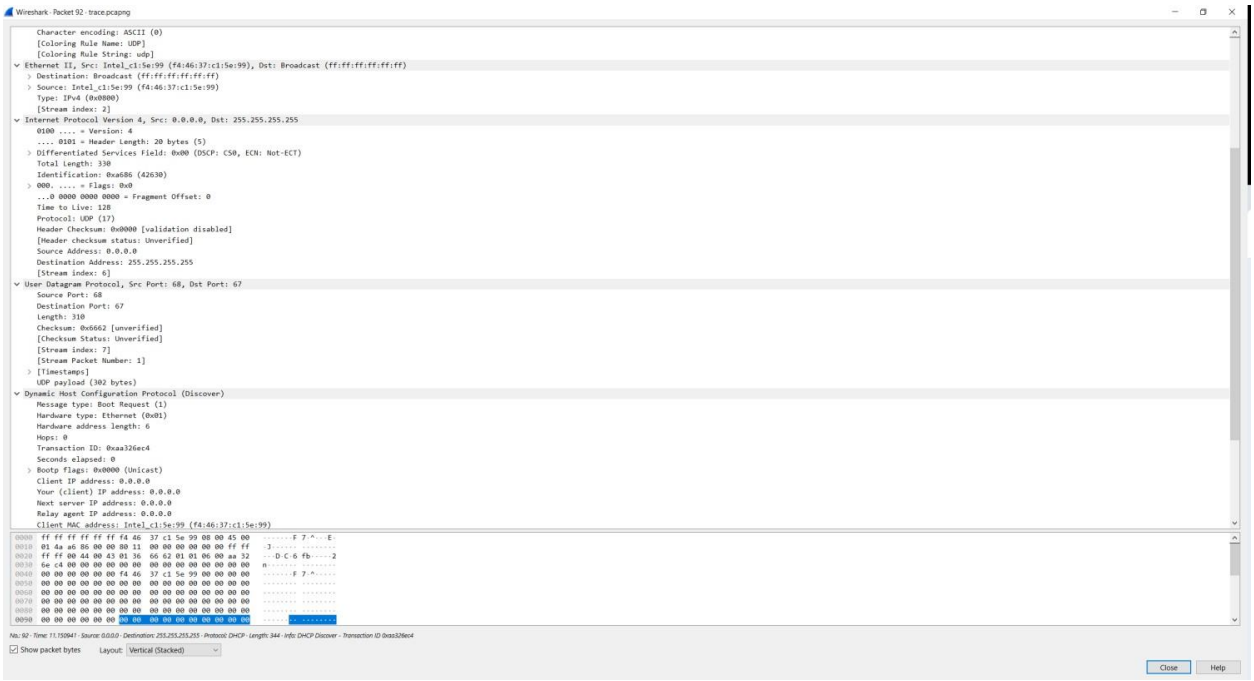
Destination IP address of the Discover message:
The destination address is **255.255.255.255**.
This address represents a local broadcast, ensuring that the DHCP request reaches all DHCP servers available on the same network segment.

4. Transaction ID in the DHCP Discover message?
Transaction ID value in the Discover message:
The transaction ID (xid) observed in the DHCP Discover message is **0xaa326ec4**.

5. Five configuration items requested by the client (Options field):
Five configuration parameters requested by the client:
In addition to an IP address, the client asks for several network settings, including:

- Subnet Mask
- Default Gateway (Router)
- DNS Server
- Domain Name
- Host Name (e.g., the client's device name)

DHCP Offer (Questions 6–9)



6. How do we know this Offer corresponds to the earlier Discover?
How do we know the Offer is a response to the Discover?
The DHCP Offer carries the **same transaction ID (0xaa326ec4)** as the Discover message, which uniquely associates the response with the original request.

7. Source IP address of the Offer message? Why special?
Source IP address of the Offer message:
The source IP is **192.168.1.1**, which corresponds to the DHCP server (usually the local router) that is proposing network configuration details to the client.

8. Destination IP address of the Offer message? Why special?
Destination IP address of the Offer message:
The destination address is **192.168.1.110**.
This is notable because the server sends the Offer directly to the proposed client IP instead of broadcasting, which is allowed by DHCP standards.

9. Five configuration items provided by the DHCP server:

Five parameters provided in the DHCP Offer:
The server supplies several configuration values, such as:

- IP address lease duration
- Subnet Mask
- Default Gateway
- DNS Server
- DHCP Server Identifier

DHCP Request (Questions 10–14)

10. UDP source and destination ports in DHCP Request?

UDP ports used in the DHCP Request:

- Source port: 68
- Destination port: 67

11. Source IP address of the Request message? Why special?

Source IP address of the Request message:

The Request message originates from **0.0.0.0**.

Although an IP has been offered, the client has not finalized the lease yet, so it continues using the unspecified address.

12. Destination IP address of the Request message? Why special?

Destination IP address of the Request message:

The destination is **255.255.255.255**.

This broadcast informs all DHCP servers that the client has chosen a specific offer.

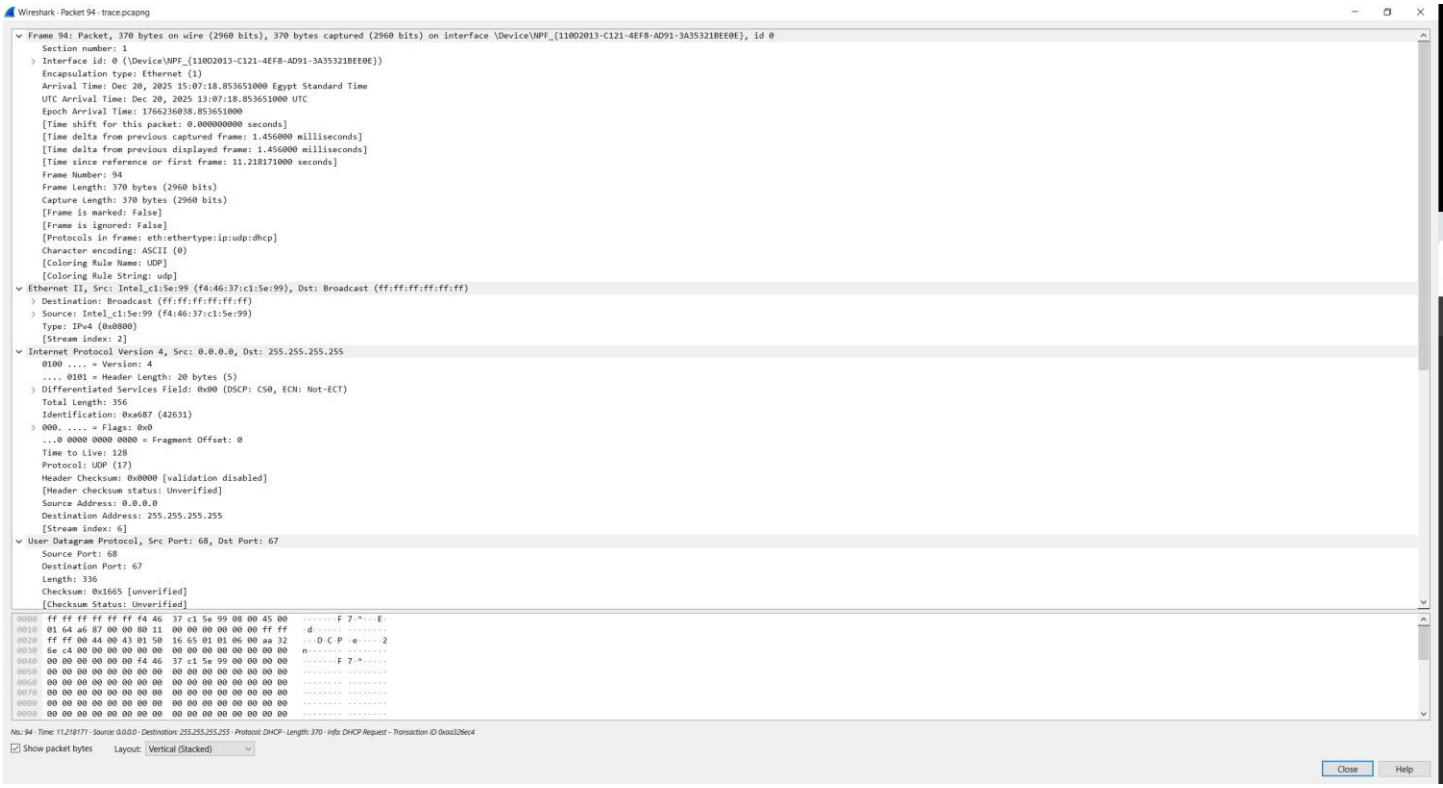
13. Transaction ID in the DHCP Request? Match earlier messages?

Yes, it matches the Discover and Offer Transaction ID.

14. Difference in "Parameter Request List" between Discover and Request:

Difference between Parameter Request Lists in Discover and Request:
The list of requested parameters remains the same. However, the Request message additionally includes the **Requested IP Address** and **DHCP Server Identifier**, indicating which server's offer the client has accepted.

DHCP ACK (Questions 15–19)



15. Source IP address of the DHCP ACK? Why special?
Source IP address of the DHCP ACK message:
The ACK message is sent from **192.168.1.1**, the DHCP server confirming the successful address assignment.

16. Destination IP address of the DHCP ACK? Why special?
Destination IP address of the DHCP ACK message:
The ACK is delivered to **192.168.1.110**, which is the IP address officially assigned to the client.

17. Field containing the assigned client IP address?
Field containing the assigned client IP address:
The assigned address appears in the **"Your (client) IP address" (yiaddr)** field.

18. Lease time assigned by the DHCP server?

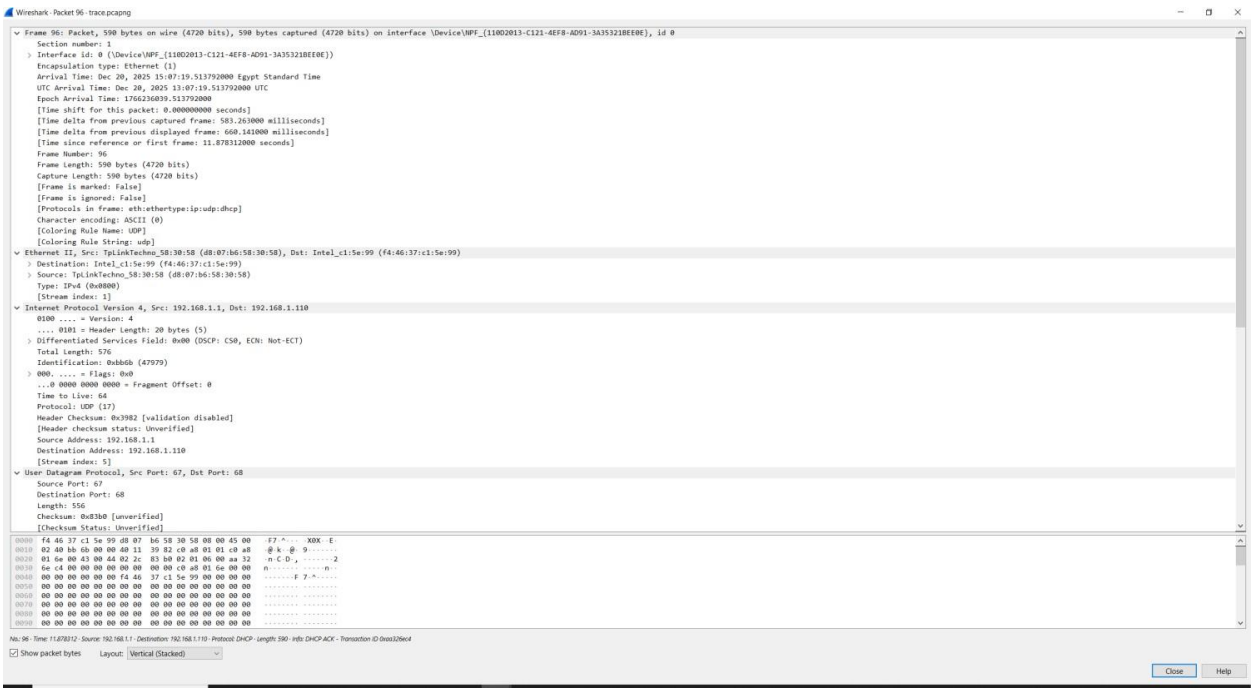
Lease time assigned to the client:

The DHCP server grants the address for **86400 seconds**, equivalent to **24 hours**.

19. Default gateway IP address provided to the client?

First-hop router IP address:

The default gateway provided to the client is **192.168.1.1**, as specified in the Router (Option 3) field.



final results :

1. **UDP**
2. **0.0.0.0** – client has no IP yet
3. **255.255.255.255** – local broadcast
4. **0xaa326ec4**
5. Subnet Mask, Default Gateway, DNS Server, Domain Name, Host Name
6. Same **Transaction ID (0xaa326ec4)**
7. **192.168.1.1** – DHCP server
8. **192.168.1.110** – offered client IP
9. Lease Time, Subnet Mask, Gateway, DNS Server, Server Identifier

10. **Source: 68, Destination: 67**
11. **0.0.0.0** – IP not bound yet
12. **255.255.255.255** – broadcast to all DHCP servers
13. **0xaa326ec4** – yes, it matches
14. Same parameter list; Request adds **Requested IP** and **Server Identifier**
15. **192.168.1.1** – DHCP server
16. **192.168.1.110** – assigned client IP
17. **Your (client) IP address (yiaddr)**
18. **86400 seconds (1 day)**
19. **192.168.1.1**