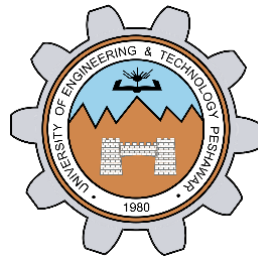


# **Data Communication And Networks Lab**

## **Lab report 06**



**Spring: 2023**

DCN Lab

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Class Section: **B**

Submitted to:

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*Department of Computer Systems Engineering*  
*University of Engineering and Technology, Peshawar*

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**CSE 303L: Data Communication and Computer Networks**


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**Credit Hours: 1**

Demonstration of Concepts	Poor (Does not meet expectation (1))	Fair (Meet Expectation (2-3))	Good (Exceeds Expectation (4-5))	Score
	The student failed to demonstrate a clear understanding of the assignment concepts	The student demonstrated a clear understanding of some of the assignment concepts	The student demonstrated a clear understanding of the assignment concepts	30%
Accuracy	The student mis-configured enough network settings that the lab computer couldn't function properly on the network	The student configured enough network settings that the lab computer partially functioned on the network	The student configured the network settings that the lab computer fully functioned on the network	30%
Following Directions	The student clearly failed to follow the verbal and written instructions to successfully complete the lab	The student failed to follow the some of the verbal and written instructions to successfully complete all requirements of the lab	The student followed the verbal and written instructions to successfully complete requirements of the lab	20%
Time Utilization	The student failed to complete even part of the lab in the allotted amount of time	The student failed to complete the entire lab in the allotted amount of time	The student completed the lab in its entirety in the allotted amount of time	20%

## Lab Report 06

### Wireshark Lab: DHCP

#### Objectives:

In this lab, we'll take a **quick look at DHCP**. Recall that DHCP is used extensively in corporate, university and home-network wired and wireless LANs to dynamically assign IP addresses to hosts (as well as to configure other network configuration information).

#### DHCP Experiment

In order to observe DHCP in action, we'll perform several DHCP-related commands and capture the *DHCP messages* exchanged as a result of executing these commands. Do the following:

1. Begin by opening the Windows Command Prompt application (which can be found in your Accessories folder). As shown in Figure 1, enter "***ipconfig /release***". The executable for *ipconfig* is in C:\windows\system32. This command releases your current IP address, so that your host's IP address becomes 0.0.0.0.
2. Start up the Wireshark packet sniffer, as described in the introductory Wireshark lab and begin Wireshark packet capture.
3. Now go back to the Windows Command Prompt and enter "***ipconfig /renew***". This instructs your host to obtain a network configuration, including a new IP address. In Figure 1, the host obtains the IP address 192.168.1.101
4. Wait until the "***ipconfig /renew***" has terminated. Then enter the same command "***ipconfig /renew***" again.
5. When the second "***ipconfig /renew***" terminates, enter the command "***ipconfig /release***" to release the previously-allocated IP address to your computer.
6. Finally, enter "***ipconfig /renew***" to again be allocated an IP address for your computer.
7. Stop Wireshark packet capture.

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C:\Users\hp>ipconfig/renew

Windows IP Configuration

No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 11 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter VirtualBox Host-Only Network:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::ddcc:98e7:8e79:4d2a%17
    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* 11:

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

Ethernet adapter Bluetooth Network Connection:
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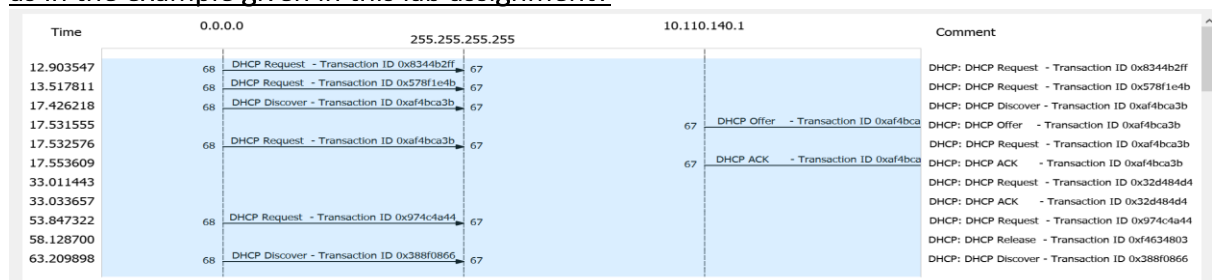
No.	Time	Source	Destination	Protocol	Length	Info
89	13.517811	0.0.0.0	255.255.255.255	DHCP	364	DHCP Request - Transaction ID 0x578f1e4b
142	17.426218	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xaf4bca3b
144	17.531555	10.110.140.1	10.110.141.155	DHCP	342	DHCP Offer - Transaction ID 0xaf4bca3b
145	17.532576	0.0.0.0	255.255.255.255	DHCP	370	DHCP Request - Transaction ID 0xaf4bca3b
146	17.553609	10.110.140.1	10.110.141.155	DHCP	342	DHCP ACK - Transaction ID 0xaf4bca3b
862	33.011443	10.110.141.155	192.168.100.153	DHCP	358	DHCP Request - Transaction ID 0x32d484d4
863	33.033657	192.168.100.153	10.110.141.155	DHCP	342	DHCP ACK - Transaction ID 0x32d484d4
1067	53.847322	0.0.0.0	255.255.255.255	DHCP	340	DHCP Request - Transaction ID 0x974c4a44
1092	58.128700	10.110.141.155	192.168.100.153	DHCP	342	DHCP Release - Transaction ID 0xf4634803
1160	63.209898	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0x388f0866
1161	63.222725	10.110.140.1	10.110.141.155	DHCP	342	DHCP Offer - Transaction ID 0x388f0866

**Figure 2** Wireshark windows with first DHCP packet – the DHCP Discover packet – expanded.

**1. Are DHCP messages sent over UDP or TCP?**

DHCP messages are sent over UDP (User Datagram Protocol) A DHCP client uses UDP port 68 to send messages to a DHCP server, and a DHCP server uses UDP port 67 to send messages to a DHCP client.

**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, indicated the source and destination port numbers. Are the port numbers the same as in the example given in this lab assignment?**



- Src – 68, Dst – 67
- Dst – 67, Src – 68
- Src – 68, Dst – 67
- Dst – 67, Src – 68

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

Relay agent IP address: 0.0.0.0

Client MAC address: LiteonTe\_7b:73:d3 (f8:28:19:7b:73:d3)

Client hardware address padding: 00000000000000000000

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

The message type value differentiates from the discover and request message. 1 is for discover and 3 is for request.

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?

No.	Time	Source	Destination	Protocol	Length	Info
89	13.517811	0.0.0.0	255.255.255.255	DHCP	364	DHCP Request - Transaction ID 0x578f1e4b
142	17.426218	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xaf4bca3b
144	17.531555	10.110.140.1	10.110.141.155	DHCP	342	DHCP Offer - Transaction ID 0xaf4bca3b
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1092	58.128700	10.110.141.155	192.168.100.153	DHCP	342	DHCP Release - Transaction ID 0xf4634803
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1161	63.222725	10.110.140.1	10.110.141.155	DHCP	342	DHCP Offer - Transaction ID 0x388f0866

The purpose is to differentiate between the groups of messages.

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.

No.	Time	Source	Destination	Protocol	Length	Info
89	13.517811	0.0.0.0	255.255.255.255	DHCP	364	DHCP Request - Transaction ID 0x578f1e4b
142	17.426218	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xaf4bca3b
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1161	63.222725	10.110.140.1	10.110.141.155	DHCP	342	DHCP Offer - Transaction ID 0x388f0866

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

Client IP address: 0.0.0.0

Your (client) IP address: 0.0.0.0

Next server IP address: 0.0.0.0

Relay agent IP address: 0.0.0.0

Client MAC address: LiteonTe\_7b:73:d3 (f8:28:19:7b:73:d3)

8. What IP address is the DHCP server offered to your host in the DHCP Offer message? Indicate which DHCP message contains the offered DHCP address.

0.0.0.0

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

When server assign us a lease time until we release it can't assign it to any other. The lease time is the amount of the time the user is aloud connection to the router.

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

The lease time in DHCP (Dynamic Host Configuration Protocol) refers to the duration for which a client is granted the right to use an IP address assigned by a DHCP server. The

purpose of the lease time is to manage the allocation and availability of IP addresses within a network.

11. 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?

- Release message tells us about the IP address when disconnected from our device.
- No DHCP issue an acknowledgment of receipt of the client's DHCP request.
- If release message is lost then it can't assigned us a network.

*THE END!*

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