

CS315: Assignment-9

Name: Shahil Patel

Roll No.: 200010039

DHCP Questions

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

Ans: The DHCP discover message is sent out using **UDP** as the underlying transport protocol.

827	51.989355108	0.0.0.0	255.255.255.255	DHCP	342 DHCP Discover	- Transaction ID 0x5cca7362
829	51.990221167	10.250.65.250	10.250.65.33	DHCP	316 DHCP Offer	- Transaction ID 0x5cca7362
830	51.990515686	0.0.0.0	255.255.255.255	DHCP	342 DHCP Request	- Transaction ID 0x5cca7362
833	51.995365008	10.250.65.250	10.250.65.33	DHCP	316 DHCP ACK	- Transaction ID 0x5cca7362

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

Ans: Source IP address: **0.0.0.0**

Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255

The **0.0.0.0** IP address indicates that *the source hasn't been allotted any IP address yet and therefore it is using the default IP address as 0.0.0.0*

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

Ans: Destination IP address: 255.255.255.255

Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255

This means that just like a network broadcast IP this message will be transmitted to all network adapters on the local network segment.

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

Ans: Transaction ID: **0x5cca7362**

Transaction ID 0x5cca7362

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?

Ans: The pieces of information that the client is suggesting or requesting to receive from the DHCP server as part of this DHCP transaction are:

- a. **DHCP message type**
- b. **Host Name**
- c. **Parameter Request List**

- Option: (53) DHCP Message Type (Discover)
- Option: (12) Host Name
- Option: (55) Parameter Request List
- Option: (255) End

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?

Ans: The Discover and the offer message has the same transaction IDs (i.e. **0x5cca7362**)

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

Ans: Source IP address: **10.250.65.250**

This is the IP address of the DHCP server.

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

Ans: The destination IP address is: **10.250.65.33**

This is the new IP address that will be allotted to the client.

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?

Ans: The pieces of information that the DHCP server is providing to the DHCP client in the DHCP offer message are:

- a. **IP Address Lease Time**
- b. **DHCP Message Type (Offer)**
- c. **Subnet Mask (255.255.255.0)**
- d. **DHCP Server Identifier (10.250.65.250)**
- e. **Router**
- f. **Domain Name server**

```
magic COOKIE. DHCP
  ▶ Option: (51) IP Address Lease Time
  ▶ Option: (53) DHCP Message Type (Offer)
  ▶ Option: (1) Subnet Mask (255.255.255.0)
  ▶ Option: (54) DHCP Server Identifier (10.250.65.250)
  ▶ Option: (3) Router
  ▶ Option: (6) Domain Name Server
  ▶ Option: (255) End
```

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?

Ans: UDP source port number: **68**

UDP destination port number: **67**

```
▶ User Datagram Protocol, Src Port: 68, Dst 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.

Ans: Source IP address: **0.0.0.0**

```
830 51.990515686  0.0.0.0          255.255.255.255    DHCP      342 DHCP Request
```

It would be 0.0.0.0 because the host doesn't have an IP address assigned to it yet.

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

Ans: The destination address IP address is: **255.255.255.255**

```
830 51.990515686 0.0.0.0 255.255.255.255 DHCP 342 DHCP Request
```

This means that just like a network broadcast IP this message will be transmitted to all network adapters on the local network segment.

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?

Ans: The value in the Transaction ID field of this DHCP Request message is:
0x5cca7362

```
342 DHCP Request - Transaction ID 0x5cca7362
```

The transaction ID of the request message is the same as the transaction ID of the earlier Discover message and Offer Message.

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?

Ans: There is **no difference** between the entries in the 'parameter request list' options in the request message and the same list option in the earlier Discover message.

- The Discover Message.

```
DHCP: Discover (1)
  Option: (12) Host Name
    Length: 21
    Host Name: sysad-OptiPlex-7050-1
  Option: (55) Parameter Request List
    Length: 13
    Parameter Request List Item: (1) Subnet Mask
    Parameter Request List Item: (28) Broadcast Address
    Parameter Request List Item: (2) Time Offset
    Parameter Request List Item: (3) Router
    Parameter Request List Item: (15) Domain Name
    Parameter Request List Item: (6) Domain Name Server
    Parameter Request List Item: (119) Domain Search
    Parameter Request List Item: (12) Host Name
    Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
    Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
    Parameter Request List Item: (26) Interface MTU
    Parameter Request List Item: (121) Classless Static Route
    Parameter Request List Item: (42) Network Time Protocol Servers
```

- The Request message.

```

DHCP: Request (3)
  Option: (54) DHCP Server Identifier (10.250.65.250)
  Option: (50) Requested IP Address (10.250.65.33)
  Option: (12) Host Name
  Option: (55) Parameter Request List
    Length: 13
    Parameter Request List Item: (1) Subnet Mask
    Parameter Request List Item: (28) Broadcast Address
    Parameter Request List Item: (2) Time Offset
    Parameter Request List Item: (3) Router
    Parameter Request List Item: (15) Domain Name
    Parameter Request List Item: (6) Domain Name Server
    Parameter Request List Item: (119) Domain Search
    Parameter Request List Item: (12) Host Name
    Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server
    Parameter Request List Item: (47) NetBIOS over TCP/IP Scope
    Parameter Request List Item: (26) Interface MTU
    Parameter Request List Item: (121) Classless Static Route
    Parameter Request List Item: (42) Network Time Protocol Servers

```

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

Ans: Source IP address: **10.250.65.250**

833	51.995365008	10.250.65.250	10.250.65.33	DHCP	316 DHCP ACK	- Transaction ID 0x5cca7362
-----	--------------	---------------	--------------	------	--------------	-----------------------------

This is the IP address of the DHCP server.

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

Ans: Destination IP address: **10.250.65.33**

200.200.200.200	DHCP	316 DHCP ACK	- Transaction ID 0x5cca7362
10.250.65.33	DHCP	316 DHCP ACK	- Transaction ID 0x5cca7362

This is the new IP address that will be allotted to the client.

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?

Ans: The name of the field in the DHCP ACK message that contains the assigned client IP address is: **Your (client) IP address**

```

Client IP address: 0.0.0.0
Your (client) IP address: 10.250.65.33
Next server IP address: 0.0.0.0

```

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

Ans: The DHCP server assigned this IP address to the client for **2 hours**.

```
Option: (51) IP Address Lease Time
Length: 4
IP Address Lease Time: (7200s) 2 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?

Ans: The IP address of the first-hop router on the default path from the client to the rest of the Internet is: **10.250.65.250**

```
Option: (3) Router
Length: 4
Router: 10.250.65.250
```