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CIS 337 01

## Wireshark Lab:

### DHCP v8.1

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

- › Ethernet II, Src: Cisco\_be:14:00 (f0:f7:55:be:14:  
  MAC address of the host)
- › Internet Protocol Version 4, Src: 35.38.207.254,  
  IP address of the host)
- › User Datagram Protocol, Src Port: 67, Dst Port:  
  Port number used by the host)
- › Dynamic Host Configuration Protocol (ACK)

**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	Destination	Protocol	Length	Info
0.0.0.0	255.255.255.255	DHCP	342	DHCP Disc
35.38.207.254	35.38.201.56	DHCP	343	DHCP Offe

**0.0.0.0. defines an IP block containing all possible IP addresses**

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

Source	Destination	Protocol	Length	Info
0.0.0.0	255.255.255.255	DHCP	342	DHCP Disc
35.38.207.254	35.38.201.56	DHCP	343	DHCP Offe

**255.255.255.255 it is a “local broadcast,” instructing any IP stack seeing that address to process the packet locally.**

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

2 DHCP Discover - Transaction ID 0x78b347cb  
3 DHCP Offer - Transaction ID 0x78b347cb

**0x78b347cb**

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?

```
Magic cookie: DHCP
> Option: (53) DHCP Message Type (Discover)
> Option: (61) Client identifier
> Option: (50) Requested IP Address (35.38.200.199)
> Option: (12) Host Name
> Option: (60) Vendor class identifier
> Option: (55) Parameter Request List
> Option: (255) End
```

**DHCP message type, Client identifier, Hostname, Vendor class identifier, Parameter request list**

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?

**The transaction ID in this DHCP OFFER is the same as the transaction ID that was used for the earlier 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.

35.38.207.254	35.38.201.56	DHCP	343 DHCP Offer
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**35.38.201.56 ; This was the IP that was given to us by 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. [If you really want to dig into this, consult the [DHCP RFC](#), page 24.]

35.38.207.254	35.38.201.56	DHCP	343 DHCP Offer
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**35.38.207.254 ; This is the domain server that is giving us our IP address**

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?

.....  
Magic cookie: DHCP  
> Option: (53) DHCP Message Type (Offer)  
> Option: (1) Subnet Mask (255.255.240.0)  
> Option: (58) Renewal Time Value  
> Option: (59) Rebinding Time Value  
> Option: (51) IP Address Lease Time  
> Option: (54) DHCP Server Identifier (35.40.0.66)  
> Option: (3) Router  
> Option: (6) Domain Name Server  
> Option: (15) Domain Name

**Subnet mask, Renewal Time Value, IP address lease time, DHCP server identifier, Domain name server**

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?

SOURCE. 0.0.0.0  
Destination: 255.255.255.255  
User Datagram Protocol, Src Port: 68, Dst Port: 67  
Source Port: 68  
Destination Port: 67  
Length: 320

**Source Port: 68, 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.

0.0.0.0 255.255.255.255 DHCP 354 DHCP Request - Tr

**0.0.0.0 defines an IP block containing all possible IP addresses**

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

**255.255.255.255 it is a “local broadcast,” instructing any IP stack seeing that address to process the packet locally.**

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?

354 DHCP Request - Transaction ID 0x78b347cb  
354 DHCP ACK

**Yes the transaction ID is the same as the Discover and Offer messages**

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?

Parameter Request List Item: (1) Subnet Mask  
Parameter Request List Item: (3) Router  
Parameter Request List Item: (6) Domain Name Server  
Parameter Request List Item: (15) Domain Name  
**Parameter Request List Item: (31) Perform Router Discover**  
Parameter Request List Item: (33) Static Route  
Parameter Request List Item: (43) Vendor-Specific Information  
Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server  
Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type  
Parameter Request List Item: (47) NetBIOS over TCP/IP Scope  
Parameter Request List Item: (119) Domain Search  
Parameter Request List Item: (121) Classless Static Route  
Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)  
Parameter Request List Item: (252) Private/Proxy autodiscovery  
...

**The parameter request list is asking for the Subnet mask, router, Domain name server, domain name, perform router discovery, static route, vendor-specific information, NetBIOS over TCP/IP Name Server, NetBIOS over TCP/IP Node type, NetBIOS over TCP/IP Scope, Domain search, classless static route**

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

35.38.207.254      35.38.201.56      DHCP      348 DHCP ACK - 1

**35.38.201.56, This is the IP we were given for the OFFER message**

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

35.38.207.254      35.38.201.56      DHCP      348 DHCP ACK - 1

**35.38.207.254, This is the same destination server address that offered the IP to us**

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?

Next server IP address: 0.0.0.0  
Relay agent IP address: 35.38.207.254  
Client MAC address: 00-0c-29-12-5e-21 / 74-70-5d-1

**Relay agent IP address: 35.38.207.254**

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

RENEWING TIME VALUE: (3600s) 1 hour  
▼ Option: (51) IP Address Lease Time  
Length: 4  
IP Address Lease Time: (3600s) 1 hour

**1 Hour**

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?

PTR-RR result: 255  
▼ Option: (3) Router  
Length: 4  
Router: 35.38.207.254  
▼ Option: (6) Domain Name Server

**35.38.207.254**