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CST 311
Lab 6
June 8 2015

1. UDP

```
No.     Time            Source                  Destination
Protocol Length Info
     2 09:57:22.614018 0.0.0.0                 255.255.255.255        DHCP
342    DHCP Discover - Transaction ID 0x3e5e0ce3

Frame 2: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits)
Ethernet II, Src: DellComp_4f:36:23 (00:08:74:4f:36:23), Dst: Broadcast
(ff:ff:ff:ff:ff:ff)
Internet Protocol Version 4, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255
(255.255.255.255)
User Datagram Protocol, Src Port: 68 (68), Dst Port: 67 (67)
    Source Port: 68 (68)
    Destination Port: 67 (67)
    Length: 308
    Checksum: 0xe97b [validation disabled]
    [Stream index: 1]
Bootstrap Protocol (Discover)
```

2.
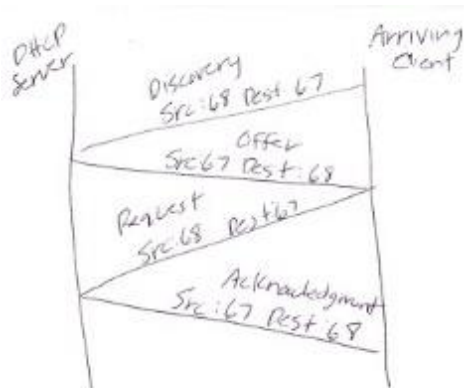
Yes

```
No.     Time            Source                  Destination
Protocol Length Info
     4 09:57:23.659783 192.168.1.1             255.255.255.255        DHCP
590    DHCP Offer    - Transaction ID 0x3e5e0ce3

Frame 4: 590 bytes on wire (4720 bits), 590 bytes captured (4720 bits)
Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Broadcast
(ff:ff:ff:ff:ff:ff)
    Destination: Broadcast (ff:ff:ff:ff:ff:ff)
    Source: LinksysG_da:af:73 (00:06:25:da:af:73)
```

```
    Type: IP (0x0800)
Internet Protocol Version 4, Src: 192.168.1.1 (192.168.1.1), Dst:
255.255.255.255 (255.255.255.255)
User Datagram Protocol, Src Port: 67 (67), Dst Port: 68 (68)
Bootstrap Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0x3e5e0ce3
    Seconds elapsed: 0
    Bootp flags: 0x0000 (Unicast)
    Client IP address: 0.0.0.0 (0.0.0.0)
    Your (client) IP address: 192.168.1.101 (192.168.1.101)
    Next server IP address: 0.0.0.0 (0.0.0.0)
    Relay agent IP address: 0.0.0.0 (0.0.0.0)
    Client MAC address: DellComp_4f:36:23 (00:08:74:4f:36:23)
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
    Option: (53) DHCP Message Type (Offer)
    Option: (1) Subnet Mask
    Option: (3) Router
    Option: (6) Domain Name Server
    Option: (15) Domain Name
    Option: (51) IP Address Lease Time
    Option: (54) DHCP Server Identifier
    Option: (255) End
    Padding
```

3. (00:06:25:da:af:73)

```
No.     Time                Source                  Destination
Protocol Length Info
    2 09:57:22.614018 0.0.0.0                  255.255.255.255      DHCP
342     DHCP Discover - Transaction ID 0x3e5e0ce3

Frame 2: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits)
Ethernet II, Src: DellComp_4f:36:23 (00:08:74:4f:36:23), Dst: Broadcast
(ff:ff:ff:ff:ff:ff)
Internet Protocol Version 4, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255
(255.255.255.255)
User Datagram Protocol, Src Port: 68 (68), Dst Port: 67 (67)
Bootstrap Protocol (Discover)
    Message type: Boot Request (1)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0x3e5e0ce3
    Seconds elapsed: 0
    Bootp flags: 0x0000 (Unicast)
        0... .... .... .... = Broadcast flag: Unicast
```

```
        .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0 (0.0.0.0)
    Your (client) IP address: 0.0.0.0 (0.0.0.0)
    Next server IP address: 0.0.0.0 (0.0.0.0)
    Relay agent IP address: 0.0.0.0 (0.0.0.0)
    Client MAC address: DellComp_4f:36:23 (00:08:74:4f:36:23)
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
    Option: (53) DHCP Message Type (Discover)
        Length: 1
        DHCP: Discover (1)
    Option: (116) DHCP Auto-Configuration
        Length: 1
        DHCP Auto-Configuration: AutoConfigure (1)
    Option: (61) Client identifier
        Length: 7
        Hardware type: Ethernet (0x01)
        Client MAC address: DellComp_4f:36:23 (00:08:74:4f:36:23)
    Option: (50) Requested IP Address
        Length: 4
        Requested IP Address: 192.168.1.101 (192.168.1.101)
    Option: (12) Host Name
        Length: 4
        Host Name: Noho
    Option: (60) Vendor class identifier
        Length: 8
        Vendor class identifier: MSFT 5.0
    Option: (55) Parameter Request List
        Length: 11
        Parameter Request List Item: (1) Subnet Mask
        Parameter Request List Item: (15) Domain Name
        Parameter Request List Item: (3) Router

No.     Time              Source                  Destination
Protocol Length Info
    5 09:57:23.659956 0.0.0.0                 255.255.255.255       DHCP
342    DHCP Request  - Transaction ID 0x3e5e0ce3

Frame 5: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits)
Ethernet II, Src: DellComp_4f:36:23 (00:08:74:4f:36:23), Dst: Broadcast
(ff:ff:ff:ff:ff:ff)
Internet Protocol Version 4, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255
(255.255.255.255)
User Datagram Protocol, Src Port: 68 (68), Dst Port: 67 (67)
Bootstrap Protocol (Request)
    Message type: Boot Request (1)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0x3e5e0ce3
    Seconds elapsed: 0
    Bootp flags: 0x0000 (Unicast)
```

```
       0... .... .... .... = Broadcast flag: Unicast
       .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0 (0.0.0.0)
    Your (client) IP address: 0.0.0.0 (0.0.0.0)
    Next server IP address: 0.0.0.0 (0.0.0.0)
    Relay agent IP address: 0.0.0.0 (0.0.0.0)
    Client MAC address: DellComp_4f:36:23 (00:08:74:4f:36:23)
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
    Option: (53) DHCP Message Type (Request)
        Length: 1
        DHCP: Request (3)
    Option: (61) Client identifier
        Length: 7
        Hardware type: Ethernet (0x01)
        Client MAC address: DellComp_4f:36:23 (00:08:74:4f:36:23)
    Option: (50) Requested IP Address
        Length: 4
        Requested IP Address: 192.168.1.101 (192.168.1.101)
    Option: (54) DHCP Server Identifier
        Length: 4
        DHCP Server Identifier: 192.168.1.1 (192.168.1.1)
    Option: (12) Host Name
        Length: 4
        Host Name: Noho
    Option: (60) Vendor class identifier
        Length: 8
        Vendor class identifier: MSFT 5.0
    Option: (55) Parameter Request List
        Length: 11
        Parameter Request List Item: (1) Subnet Mask
        Parameter Request List Item: (15) Domain Name
        Parameter Request List Item: (3) Router
        Parameter Request List Item: (6) Domain Name Server
        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: (31) Perform Router Discover
        Parameter Request List Item: (33) Static Route
        Parameter Request List Item: (249) Private/Classless Static Route
(Microsoft)
        Parameter Request List Item: (43) Vendor-Specific Information
    Option: (255) End
        Option End: 255
    Padding
```

4. Option 53, Message type differs (discover or request)

```
    2 09:57:22.614018 0.0.0.0                    255.255.255.255        DHCP
342    DHCP Discover - Transaction ID 0x3e5e0ce3
```

```
     4 09:57:23.659783 192.168.1.1          255.255.255.255     DHCP
590    DHCP Offer   - Transaction ID 0x3e5e0ce3
     5 09:57:23.659956 0.0.0.0              255.255.255.255     DHCP
342    DHCP Request  - Transaction ID 0x3e5e0ce3
     6 09:57:23.661966 192.168.1.1          255.255.255.255     DHCP
590    DHCP ACK     - Transaction ID 0x3e5e0ce3
    42 09:57:45.895986 0.0.0.0              255.255.255.255     DHCP
342    DHCP Discover - Transaction ID 0x3a5df7d9
    44 09:57:46.934966 192.168.1.1          255.255.255.255     DHCP
590    DHCP Offer   - Transaction ID 0x3a5df7d9
    45 09:57:46.935137 0.0.0.0              255.255.255.255     DHCP
342    DHCP Request  - Transaction ID 0x3a5df7d9
    46 09:57:46.937146 192.168.1.1          255.255.255.255     DHCP
590    DHCP ACK     - Transaction ID 0x3a5df7d9
```

5. 0x3e5e0ce3; 0x3a5df7d9; To identify each component of each individual four step process of assigning an IP.

6. The client uses source, 0.0.0.0 because it doesn't yet have an IP. The server uses it's own IP. Both client and server use destination 255.255.255.255 to broadcast their message to every device on the subnet.

7. 192.168.1.1

8. (192.168.1.101); No. 4

9. The address in the relay agent field is 0.0.0.0.; I used the trace provided.

```
     4 09:57:23.659783 192.168.1.1          255.255.255.255     DHCP
590    DHCP Offer   - Transaction ID 0x3e5e0ce3
```

```
Frame 4: 590 bytes on wire (4720 bits), 590 bytes captured (4720 bits)
Ethernet II, Src: LinksysG_da:af:73 (00:06:25:da:af:73), Dst: Broadcast
(ff:ff:ff:ff:ff:ff)
Internet Protocol Version 4, Src: 192.168.1.1 (192.168.1.1), Dst:
255.255.255.255 (255.255.255.255)
User Datagram Protocol, Src Port: 67 (67), Dst Port: 68 (68)
    Source Port: 67 (67)
    Destination Port: 68 (68)
    Length: 556
    Checksum: 0x7223 [validation disabled]
    [Stream index: 2]
Bootstrap Protocol (Offer)
    Message type: Boot Reply (2)
    Hardware type: Ethernet (0x01)
    Hardware address length: 6
    Hops: 0
    Transaction ID: 0x3e5e0ce3
    Seconds elapsed: 0
    Bootp flags: 0x0000 (Unicast)
        0... .... .... .... = Broadcast flag: Unicast
```

```
        .000 0000 0000 0000 = Reserved flags: 0x0000
    Client IP address: 0.0.0.0 (0.0.0.0)
    Your (client) IP address: 192.168.1.101 (192.168.1.101)
    Next server IP address: 0.0.0.0 (0.0.0.0)
    Relay agent IP address: 0.0.0.0 (0.0.0.0)
    Client MAC address: DellComp_4f:36:23 (00:08:74:4f:36:23)
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
    Option: (53) DHCP Message Type (Offer)
        Length: 1
        DHCP: Offer (2)
    Option: (1) Subnet Mask
        Length: 4
        Subnet Mask: 255.255.255.0 (255.255.255.0)
    Option: (3) Router
        Length: 4
        Router: 192.168.1.1 (192.168.1.1)
    Option: (6) Domain Name Server
        Length: 8
        Domain Name Server: 63.240.76.19 (63.240.76.19)
        Domain Name Server: 204.127.198.19 (204.127.198.19)
    Option: (15) Domain Name
        Length: 22
        Domain Name: ne2.client2.attbi.com
    Option: (51) IP Address Lease Time
        Length: 4
        IP Address Lease Time: (86400s) 1 day
    Option: (54) DHCP Server Identifier
        Length: 4
```

10. It gives the client the router and subnet it should use.

11. In option 50 the client requests the offered address.

12. It limits the amount of time that a client has to accept the offer of an IP address. That way the resource can be re-allocated if the offer is not accepted; 1 day.

13. It releases the allocated IP address back to the DHCP server; I don't think so; The IP address would be released to the server when the lease time expired if the client did not renew the lease.

14. It's a broadcast message occurring between the discover and offer messages. I'm not sure how it functions.