# **CMPT371 Project 2 Lab**

Weida Pan 301295773

# **DHCP**

#### command:

```
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1.

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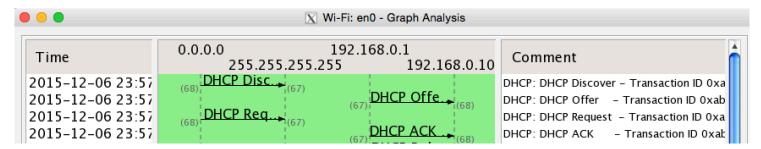
Fragment offset: 0

Time to live: 255

Protocol: UDP (17)

Header checksum: 0x2f24 [validat Over UDP.

2.



packet 1: source port is 68, destination port is 67.

packet 2: source port is 67, destination port is 68. packet 3: source port is 68, destination port is 67. packet 4: source port is 67, destination port is 68. Yes.

#### 3.

Frame 2: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface 0

▶ Ethernet II, Src: Apple\_03:53:db (a0:99:9b:03:53:db), 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.

The link-layer address is a0:99:9b:03:53:db.

#### 4.

DOption: (12) Host Name
Option: (255) End
Padding

```
4 2015-12-07 00:09:53.29369800.0.0.0
      5 2015-12-07 00:09:53.3071720192.168.0.1
                                                              192.168.0.104
                                                                                         DHCP
                                                                                                        590 DHCP Offer
                                                                                                                           Transaction ID 0xd131bf0a
      8 2015-12-07 00:09:54.30770200.0.0.0
                                                              255.255.255.255
                                                                                         DHCP
                                                                                                        342 DHCP Request - Transaction ID 0xd131bf0a
     9 2015-12-07 00:09:54.3203600192.168.0.1
                                                              192.168.0.104
                                                                                         DHCP
                                                                                                       590 DHCP ACK
                                                                                                                         - Transaction ID 0xd131bf0a
    161 2015-12-07 00:09:57.8629580192.168.0.104
                                                              192.168.0.1
                                                                                         DHCP
                                                                                                        342 DHCP Release
                                                                                                                         - Transaction ID 0xd131bf0b
Bootstrap Protocol (Discover)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 0
  Transaction ID: 0xd131bf0a
  Seconds elapsed: 0
▶ Bootp flags: 0x0000 (Unicast)
  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: Apple_03:53:db (a0:99:9b:03:53:db)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
Doption: (53) DHCP Message Type (Discover)
DOption: (55) Parameter Request List
Doption: (57) Maximum DHCP Message Size
DOption: (61) Client identifier
DOption: (51) IP Address Lease Time
```

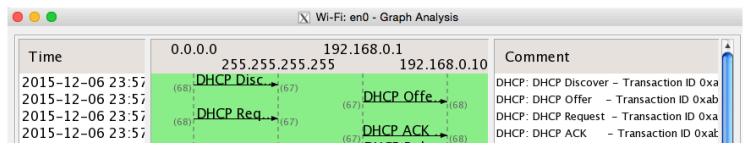
```
9 2015-12-07 00:09:54.3203600192.168.0.1
                                                              192.168.0.104
                                                                                          DHCP
                                                                                                       590 DHCP ACK
                                                                                                                         - Transaction ID 0xd131bf0a
    161 2015-12-07 00:09:57.8629580192.168.0.104
                                                              192.168.0.1
                                                                                          DHCP
                                                                                                       342 DHCP Release
                                                                                                                         - Transaction ID 0xd131bf0b
Bootstrap Protocol (Request)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 0
  Transaction ID: 0xd131bf0a
  Seconds elapsed: 1
▶ Bootp flags: 0x0000 (Unicast)
  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: Apple_03:53:db (a0:99:9b:03:53:db)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
DOPTION: (53) DHCP Message Type (Request)
  Option: (55) Parameter Request List
  Option: (57) Maximum DHCP Message Size
DOption: (61) Client identifier
DOption: (50) Requested IP Address
  Option: (54) DHCP Server Identifier
Doption: (12) Host Name
D Option: (255) End
```

Option 53, one is discover, the other is request.

#### 5.

They are all 0xd131bf0a. The second is 0x20b86883. The purpose is to make four DHCP messages as a serious of segments thus to identify different hosts or different request from one host.

6.



My computer uses 0.0.0.0 as source IP and 255.255.255.255 as destination IP address. The server uses 192.168.0.1 as source IP address and 192.168.0.10 as destination IP address.

## 7.

Server has IP address 192.168.0.1.

8.

```
4 2015-12-07 00:09:53.29369800.0.0.0
                                                                 255.255.255.255
                                                                                                           342 DHCP Discover - Transaction ID 0x
        5 2015-12-07 00:09:53.3071720192.168.0
                                                                 192.168.0.104
        8 2015-12-07 00:09:54.30770200.0.0.0
                                                                 255.255.255.255
                                                                                            DHCP
                                                                                                           342 DHCP Request
                                                                                                                            - Transaction ID 0x
        9 2015-12-07 00:09:54.3203600192.168.0.1
                                                                 192.168.0.104
                                                                                            DHCP
                                                                                                           590 DHCP ACK
                                                                                                                            - Transaction ID 0x
      161 2015-12-07 00:09:57.8629580192.168.0.104
                                                                                                           342 DHCP Release - Transaction ID 0x
                                                                 192.168.0.1
                                                                                            DHCP
 Frame 5: 590 bytes on wire (4720 bits), 590 bytes captured (4720 bits) on interface 0
 Ethernet II, Src: D-LinkIn_ac:23:a8 (b8:a3:86:ac:23:a8), Dst: Apple_03:53:db (a0:99:9b:03:53:db)
▶ Internet Protocol Version 4, Src: 192.168.0.1 (192.168.0.1), Dst: 192.168.0.104 (192.168.0.104)

    □ 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: 0xd131bf0a
    Seconds elapsed: 0
   Bootp flags: 0x0000 (Unicast)
    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: Apple_03:53:db (a0:99:9b:03:53:db)
    Client hardware address padding: 00000000000000000000
    Server host name not given
    Boot file name not given
    Magic cookie: DHCP
```

Server offers 192.168.0.104 which is in Your (client) IP address field.

9.

```
Next server IP address: 0.0.0.0 (0.0.0.0)
```

```
Relay agent IP address: 0.0.0.0 (0.0.0.0)
```

Relay agent IP address being 0.0.0.0 indicates there is no relay agent.

10.

The router information is for cases where client wants to reach network outside the subnet.

The subnet mask is for cases where wants to send request inside subnet.

#### 11.

7 2007 00 23 10.31.23.033103	152,100,1,1	200,200,200,200	DITCI	JJO DITCE OFFICE	11 01136
5 2004-08-29 16:57:23.659956		255.255.255.255	DHCP	342 DHCP Request	- Transa
6 2004-08-29 16:57:23.661966	192.168.1.1	255.255.255.	DHCP	590 DHCP ACK	- Transa
36 2004-08-29 16:57:35.161011	192.168.1.101	192.168.1.1	DHCP	342 DHCP Request	- Transa
37 2004-08-29 16:57:35.162763	192.168.1.1	255.255.255.255	DHCP	590 DHCP ACK	- Transa
41 2004-08-29 16:57:40.100700	192.168.1.101	192.168.1.1	DHCP	342 DHCP Release	- Transa
42 2004-08-29 16:57:45.895986	0.0.0.0	255.255.255.255	DHCP	342 DHCP Discover	- Transa
44 2004 00 20 16:57:46 034066	100 160 1 1	מבה מבה מבה	UUCD	SOM DUCD Offor	Tranca

```
    Doption: (61) Client identifier
    Option: (50) Requested IP Address
    Length: 4
    Requested IP Address: 192.168.1.101 (192.168.1.101)
    Option: (54) DHCP Server Identifier
    Option: (12) Host Name
    Option: (12) Host Name
    Option: (12) Host Name
    Option: (12) Host Name
    Option: (13) Host Name
    Option: (13) Host Name
    Option: (14) Host Name
    Option: (15) Host Name
    Option: (15) Host Name
    Option: (16) Host Name
    Option: (17) Host Name
    Option: (18) Ho
```

No. It is in packet of Request of request field.

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▽ Option: (51) IP Address Lease Time

Length: 4

IP Address Lease Time: (604800s) 7 days

DOption: (1) Subnet Mask

It is the longest time the host can use this IP. After that, the host will have to request for an IP again. In my experience, the lease time is 7 days.

## 13.

The purpose of DHCP release message is to tell server this client gives up this IP address so that this IP address can be assigned to other clients. Server doesn't issue an acknowledge. If it is lost, this IP address is not available until lease time is passed.

#### 14.

1 2015-12-07 00:09:51.8418080D-LinkIn_ac:23:a8	Apple_03:53:db	ARP	42 Who has 192.168.0.104? Tell 192.168.0.1
2 2015-12-07 00:09:52.51939900.0.0.0	255.255.255.255	B00TP	342 Boot Request from a0:99:9b:03:53:db (Apple_03:53:db)
3 2015-12-07 00:09:52.8597610D-LinkIn_ac:23:a8	Apple_03:53:db	ARP	42 Who has 192.168.0.104? Tell 192.168.0.1
4 2015-12-07 00:09:53.29369800.0.0.0	255.255.255.255	DHCP	342 DHCP Discover - Transaction ID 0xdl31bf0a
5 2015-12-07 00:09:53.3071720192.168.0.1	192.168.0.104	DHCP	590 DHCP Offer - Transaction ID 0xd131bf0a
6 2015-12-07 00:09:53.8838140D-LinkIn_ac:23:a8	Apple_03:53:db	ARP	42 Who has 192.168.0.104? Tell 192.168.0.1
7 2015-12-07 00:09:54.0215740fe80::a299:9bff:fe03:53db			603 Standard query response 0x0000 TXT, cache flush PTR _ssh.
8 2015-12-07 00:09:54.30770200.0.0.0	255.255.255.255	DHCP	342 DHCP Request - Transaction ID 0xd131bf0a
9 2015-12-07 00:09:54.3203600192.168.0.1	192.168.0.104	DHCP	590 DHCP ACK - Transaction ID 0xd131bf0a

Yes, there were some ARP messages. The purpose is to make sure there is no other client using a certain IP address before server offers it to one client.