

Lab3

0. Screenshot of Command prompt window

```
IPv4 地址 . . . . . : 192.168.1.76
子网掩码 . . . . . : 255.255.255.0
默认网关. . . . . : 192.168.1.254

C:\Windows\System32>ipconfig/release

Windows IP 配置

不能在 以太网上执行任何操作，它已断开媒体连接。
不能在 本地连接* 1 上执行任何操作，它已断开媒体连接。
不能在 本地连接* 2 上执行任何操作，它已断开媒体连接。

以太网适配器 以太网:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 本地连接* 1:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 本地连接* 2:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 WLAN:
    连接特定的 DNS 后缀 . . . . . :
    本地链接 IPv6 地址 . . . . . : fe80::914:5d81:1657:de33%17
    默认网关. . . . . :

C:\Windows\System32>ipconfig/renew

Windows IP 配置

不能在 以太网上执行任何操作，它已断开媒体连接。
不能在 本地连接* 1 上执行任何操作，它已断开媒体连接。
不能在 本地连接* 2 上执行任何操作，它已断开媒体连接。

以太网适配器 以太网:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 本地连接* 1:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 本地连接* 2:
    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 WLAN:
    连接特定的 DNS 后缀 . . . . . :
    本地链接 IPv6 地址 . . . . . : fe80::914:5d81:1657:de33%17
    IPv4 地址 . . . . . : 192.168.1.76
    子网掩码 . . . . . : 255.255.255.0
    默认网关. . . . . : 192.168.1.254

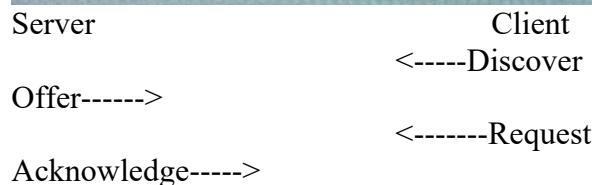
C:\Windows\System32>
```

1. DHCP uses UDP

```
Frame 202: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface 0
Ethernet II, Src: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
User Datagram Protocol, Src Port: 68, Dst Port: 67
Dynamic Host Configuration Protocol (Discover)
```

3. port number indicated in Question 1: src port:68 dst port:67

Time	Source	Destination	Protocol	Length	Info
202 23.499163	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover -
217 24.547263	192.168.1.254	192.168.1.76	DHCP	392	DHCP Offer -
218 24.548444	0.0.0.0	255.255.255.255	DHCP	352	DHCP Request -
219 24.567709	192.168.1.254	192.168.1.76	DHCP	392	DHCP ACK -



4.

```
Frame 202: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface 0
Ethernet II, Src: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255
User Datagram Protocol, Src Port: 68, Dst Port: 67
Dynamic Host Configuration Protocol (Discover)
```

5.

```
Relay agent IP address: 0.0.0.0
Client MAC address: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
Client hardware address padding: 000000000000000000000000
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: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
```

```
NEXT SERVER IP address: 0.0.0.0
Relay agent IP address: 0.0.0.0
Client MAC address: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
Client hardware address padding: 000000000000000000000000
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: (61) Client identifier
> Option: (50) Requested IP Address (192.168.1.76)
> Option: (12) Host Name
> Option: (60) Vendor class identifier
```

6. first DHCP in red, second DHCP in green. Transaction-ID is for the client to identify different DHCP.

Source	Destination	Protocol	Length	Info
0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xefdf04b1
92.168.1.254	192.168.1.76	DHCP	392	DHCP Offer - Transaction ID 0xefdf04b1
0.0.0	255.255.255.255	DHCP	352	DHCP Request - Transaction ID 0xefdf04b1
92.168.1.254	192.168.1.76	DHCP	392	DHCP ACK - Transaction ID 0xefdf04b1
92.168.1.76	192.168.1.254	DHCP	342	DHCP Request - Transaction ID 0x84c37482
92.168.1.254	192.168.1.76	DHCP	392	DHCP ACK - Transaction ID 0x84c37482
92.168.1.76	192.168.1.254	DHCP	342	DHCP Release - Transaction ID 0x17aea672
0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xeae54441
92.168.1.254	192.168.1.76	DHCP	392	DHCP Offer - Transaction ID 0xeae54441
0.0.0	255.255.255.255	DHCP	352	DHCP Request - Transaction ID 0xeae54441
92.168.1.254	192.168.1.76	DHCP	392	DHCP ACK - Transaction ID 0xeae54441
0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x89c1320e
0.0.0	255.255.255.255	DHCP	342	DHCP Request - Transaction ID 0x89c1320e

7. Host is using 0.0.0.0 as source IP, 255.255.255.255 as destination IP. Server uses its real IP 192.168.1.254 as source IP and the offered IP as destination IP

Source	Destination	Protocol	Length	Info
147 31.711585	0.0.0.0	DHCP	342	DHCP Discover - T
151 32.825285	192.168.1.254	DHCP	392	DHCP Offer - T
152 32.826411	0.0.0.0	DHCP	352	DHCP Request - T
153 32.840896	192.168.1.254	DHCP	392	DHCP ACK - T
457 44.435045	192.168.1.76	DHCP	342	DHCP Request - T
458 44.443878	192.168.1.254	DHCP	392	DHCP ACK - T
555 59.326509	192.168.1.76	DHCP	342	DHCP Release - T
581 63.964082	0.0.0.0	DHCP	342	DHCP Discover - T
582 63.980002	192.168.1.254	DHCP	392	DHCP Offer - T
583 63.980483	0.0.0.0	DHCP	352	DHCP Request - T
584 63.987566	192.168.1.254	DHCP	392	DHCP ACK - T

8. Indicated above, 192.168.1.254

9. The Server offered 192.168.1.76 to my machine, lease time 1 day. The IP contained in DHCP message type(offer)

```

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: (54) DHCP Server Identifier (192.168.1.254)
  Length: 4
  DHCP Server Identifier: 192.168.1.254
▼ Option: (51) IP Address Lease Time
  Length: 4
  IP Address Lease Time: (86400s) 1 day
▼ Option: (58) Renewal Time Value
  Length: 4
  Renewal Time Value: (43200s) 12 hours

```

10. It provides renewal time value, rebinding time value, subnet mask, router, domain name server etc.

11. No relay router because its IP is 0.0.0.0

```
Message type: Boot Reply (2)
Hardware type: Ethernet (0x01)
Hardware address length: 6
Hops: 0
Transaction ID: 0xefdf04b1
Seconds elapsed: 0
> Bootp flags: 0x0000 (Unicast)
Client IP address: 0.0.0.0
Your (client) IP address: 192.168.1.76
Next server IP address: 0.0.0.0
Relay agent IP address: 0.0.0.0
Client MAC address: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
Client hardware address padding: 000000000000000000000000
Client hardware address padding: 000000000000000000000000
```

12. The router indicate the router that client should use, same as the subnet mask

```
✗ Option: (1) Subnet Mask (255.255.255.0)
Length: 4
Subnet Mask: 255.255.255.0
✗ Option: (3) Router
Length: 4
Router: 192.168.1.254
✗ Option: (6) Domain Name Server
Length: 4
```

13. It accepted

```
Client hardware address padding: 000000000000000000000000
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: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
✗ Option: (50) Requested IP Address (192.168.1.76)
Length: 4
Requested IP Address: 192.168.1.76
✗ Option: (54) DHCP Server Identifier (192.168.1.254)
```

14.Client sent a release message to server to release its current IP from Server, the Server does not send ACK to it. If the release, server will wait to the lease time to expire, to allocate this IP to other.

15.ARP is used to map MAC address with new IP. There are 2 in DHCP period.

144 31.292503	192.168.1.71	239.255.255.250	SSDP	412 NOTI
145 31.296290	192.168.1.71	239.255.255.250	SSDP	410 NOTI
146 31.306926	192.168.1.71	239.255.255.250	SSDP	380 NOTI
147 31.711585	0.0.0.0	255.255.255.255	DHCP	342 DHCP
148 31.812355	ArrisGro_75:31:f0	Broadcast	ARP	42 Who
149 31.997682	ArrisGro_75:31:f2	Broadcast		0x7373 121 Ethe
150 32.808122	ArrisGro_75:31:f0	Broadcast	ARP	42 Who
151 32.825285	192.168.1.254	192.168.1.76	DHCP	392 DHCP
152 32.826411	0.0.0.0	255.255.255.255	DHCP	352 DHCP
153 32.840896	192.168.1.254	192.168.1.76	DHCP	392 DHCP
154 32.854136	192.168.1.76	192.168.1.76	NRNC	110 Rela

16.Internet Address is the IP address; physical address is the MAC address; Type is dynamic or static.

c:\Windows\System32>arp -a		
接口: 192.168.1.76 --- 0x12		
Internet 地址	物理地址	类型
192.168.1.254	f8-2d-c0-75-31-f0	动态
192.168.1.255	ff-ff-ff-ff-ff-ff	静态
224.0.0.22	01-00-5e-00-00-16	静态
224.0.0.252	01-00-5e-00-00-fc	静态
255.255.255.255	ff-ff-ff-ff-ff-ff	静态

17.src: 8c:85:90:33:be:23 dst:ff:ff:ff:ff:ff:ff

Wireshark · 分组 807 · WLAN

```

> Frame 807: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
  ▼ Ethernet II, Src: Apple_33:be:23 (8c:85:90:33:be:23), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
    > Destination: Broadcast (ff:ff:ff:ff:ff:ff)
    > Source: Apple_33:be:23 (8c:85:90:33:be:23)
      Type: ARP (0x0806)
      Padding: 0000000000000000000000000000000000000000000000000000000000000000
  ▼ Address Resolution Protocol (request)
    Hardware type: Ethernet (1)
    Protocol type: IPv4 (0x0800)
    Hardware size: 6
    Protocol size: 4
    Opcode: request (1)
    Sender MAC address: Apple_33:be:23 (8c:85:90:33:be:23)
    Sender IP address: 192.168.1.70
    Target MAC address: 00:00:00_00:00:00 (00:00:00:00:00:00)
    Target IP address: 192.168.1.112
  
```

EE450

Summer 2019

Jiahao Liu

18.0x0806 as shown above, 1 for request

19. (1) 20 bytes (2) 1 is for request (3) Yes (4) From Target MAC address

20. (1) 20 bytes (2) 2 is for reply (3) in Sender MAC

```
> Frame 1034: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface 0
  ▼ Ethernet II, Src: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32), Dst: ArrisGro_75:31:f0 (f8:2d:c0:75:31:f0)
    > Destination: ArrisGro_75:31:f0 (f8:2d:c0:75:31:f0)
    > Source: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
      Type: ARP (0x0806)
  ▼ Address Resolution Protocol (reply)
    Hardware type: Ethernet (1)
    Protocol type: IPv4 (0x0800)
    Hardware size: 6
    Protocol size: 4
    Opcode: reply (2)
    Sender MAC address: HonHaiPr_84:ec:32 (0c:84:dc:84:ec:32)
    Sender IP address: 192.168.1.76
    Target MAC address: ArrisGro_75:31:f0 (f8:2d:c0:75:31:f0)
    Target IP address: 192.168.1.254
```

21.src: 0C:84:DC:84:EC:32 dst:f8:2d:c0:75:31:f0 shown as above

22.because ARP request is broadcast, but reply is directly send to server.