

IT304 Computer Networks

LAB 6 Understanding of DHCP using wireshark and packet tracer

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1. Experiment:-

1. Begin by opening the Windows Command Prompt application (which can be found in your Accessories folder). Enter "ipconfig /release". The executable for ipconfig is in C/windows/system32. This command releases your current IP address, so that your host's IP address becomes 0.0.0.0.
2. Start up the Wireshark packet sniffer, as described in the introductory Wireshark lab and begin Wireshark packet capture.
3. Now go back to the Windows Command Prompt and enter "ipconfig /renew". This instructs your host to obtain a network configuration, including a new IP address.
4. Wait until the "ipconfig /renew" has terminated. Then enter the same command "ipconfig /renew" again.
5. When the second "ipconfig /renew" terminates, enter the command "ipconfig/release" to release the previously-allocated IP address to your computer.
6. Finally, enter "ipconfig /renew" to again be allocated an IP address for your computer.
7. Stop Wireshark packet capture.

```
C:\Users\DELL>ipconfig /release

Windows IP Configuration

No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 2 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.
No operation can be performed on Ethernet while it has its media disconnected.

Ethernet adapter VirtualBox Host-Only Network:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::8ade:59a5:ba69:2601%12
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : 

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2409:40c1:102d:5a9a:4cae:1163:5d77:d3de
    Temporary IPv6 Address. . . . . : 2409:40c1:102d:5a9a:8c08:bdc9:e82d:df8d
    Link-local IPv6 Address . . . . . : fe80::6597:4897:9dd2:2556%7
    Default Gateway . . . . . : fe80::9473:a6ff:fee8:f77%7

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

Ethernet adapter Ethernet:

Media State : Media disconnected
Connection-specific DNS Suffix . :

C:\Users\DELL>ipconfig /renew

Windows IP Configuration

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No operation can be performed on Ethernet while it has its media disconnected.

Ethernet adapter VirtualBox Host-Only Network:

Connection-specific DNS Suffix . :
Link-local IPv6 Address : fe80::8ade:59a5:ba69:2601%12
IPv4 Address. : 192.168.56.1
Subnet Mask : 255.255.255.0
Default Gateway :

Wireless LAN adapter Local Area Connection* 1:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :
IPv6 Address. : 2409:40c1:102d:5a9a:4cae:1163:5d77:d3de
Temporary IPv6 Address. : 2409:40c1:102d:5a9a:8c08:bdc9:e82d:df8d
Link-local IPv6 Address : fe80::6597:4897:9dd2:2556%7
IPv4 Address. : 192.168.193.128

Subnet Mask : 255.255.255.0
Default Gateway : fe80::9473:a6ff:fee8:f77%7
192.168.193.212

Ethernet adapter Bluetooth Network Connection:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Ethernet adapter Ethernet:

Media State : Media disconnected
Connection-specific DNS Suffix . :

C:\Users\DELL>ipconfig /renew

Windows IP Configuration

No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
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Ethernet adapter VirtualBox Host-Only Network:

Connection-specific DNS Suffix . :
Link-local IPv6 Address : fe80::8ade:59a5:ba69:2601%12
IPv4 Address. : 192.168.56.1
Subnet Mask : 255.255.255.0
Default Gateway :

Wireless LAN adapter Local Area Connection* 1:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

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Connection-specific DNS Suffix . : 
IPv6 Address. . . . . : 2409:40c1:102d:5a9a:4cae:1163:5d77:d3de
Temporary IPv6 Address. . . . . : 2409:40c1:102d:5a9a:8c08:bd9:e82d:df8d
Link-local IPv6 Address . . . . . : fe80::6597:4897:9dd2:2556%7
IPv4 Address. . . . . : 192.168.193.128
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : fe80::9473:a6ff:fee8:f77%7
                          192.168.193.212
```

Ethernet adapter Bluetooth Network Connection:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

Ethernet adapter Ethernet:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

C:\Users\DELL>ipconfig/release

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Ethernet adapter VirtualBox Host-Only Network:

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Connection-specific DNS Suffix . : 
Link-local IPv6 Address . . . . . : fe80::8ade:59a5:ba69:2601%12
IPv4 Address. . . . . : 192.168.56.1
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
```

Wireless LAN adapter Local Area Connection* 1:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

Wireless LAN adapter Local Area Connection* 2:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

Wireless LAN adapter Wi-Fi:

```
Connection-specific DNS Suffix . : 
IPv6 Address. . . . . : 2409:40c1:102d:5a9a:4cae:1163:5d77:d3de
Temporary IPv6 Address. . . . . : 2409:40c1:102d:5a9a:8c08:bd9:e82d:df8d
Link-local IPv6 Address . . . . . : fe80::6597:4897:9dd2:2556%7
Default Gateway . . . . . : fe80::9473:a6ff:fee8:f77%7
```

Ethernet adapter Bluetooth Network Connection:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

Ethernet adapter Ethernet:

```
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```

C:\Users\DELL>ipconfig /renew

Windows IP Configuration

No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
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No operation can be performed on Bluetooth Network Connection while it has its media disconnected.
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Ethernet adapter VirtualBox Host-Only Network:

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Connection-specific DNS Suffix . : 
Link-local IPv6 Address . . . . . : fe80::8ade:59a5:ba69:2601%12
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Ethernet adapter VirtualBox Host-Only Network:

Connection-specific DNS Suffix . :
Link-local IPv6 Address : fe80::8ade:59a5:ba69:2601%12
IPv4 Address. : 192.168.56.1
Subnet Mask : 255.255.255.0
Default Gateway :

Wireless LAN adapter Local Area Connection* 1:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :
IPv6 Address. : 2409:40c1:102d:5a9a:4cae:1163:5d77:d3de
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Link-local IPv6 Address : fe80::6597:4897:9dd2:2556%7
IPv4 Address. : 192.168.193.128
Subnet Mask : 255.255.255.0
Default Gateway : fe80::9473:a6ff:fee8:f77%7
192.168.193.212

Ethernet adapter Bluetooth Network Connection:

Media State : Media disconnected
Connection-specific DNS Suffix . :

Ethernet adapter Ethernet:

Media State : Media disconnected
Connection-specific DNS Suffix . :

2. Questions:-

1. Are DHCP messages sent over UDP or TCP?

➤ UDP

dhcpc									
No.	Time	Source	Destination	Protocol	Length	Info			
402	24.695343	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request	-	Transaction ID 0xdb61ad2e	
403	24.708200	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK	-	Transaction ID 0xdb61ad2e	
469	42.886414	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request	-	Transaction ID 0xfaf3b965	
470	42.898525	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK	-	Transaction ID 0xfaf3b965	
850	76.711537	192.168.193.128	192.168.193.212	DHCP	342	DHCP Release	-	Transaction ID 0xc2c7fc29	
1171	92.944574	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover	-	Transaction ID 0xda191b46	
1172	92.954252	192.168.193.212	192.168.193.128	DHCP	352	DHCP Offer	-	Transaction ID 0xda191b46	
1173	92.958383	0.0.0.0	255.255.255.255	DHCP	370	DHCP Request	-	Transaction ID 0xda191b46	
1176	92.970329	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK	-	Transaction ID 0xda191b46	
1450	99.194343	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request	-	Transaction ID 0x772cb930	
1451	99.207313	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK	-	Transaction ID 0x772cb930	

> Frame 469: 358 bytes on wire (2864 bits), 358 bytes captured (2864 bits) on interface \Device\NPF_{47EF...}

> Ethernet II, Src: IntelCor_e0:ce:eb (7c:21:4a:e0:ce:eb), Dst: 96:73:a6:e8:0f:77 (96:73:a6:e8:0f:77)

> Internet Protocol Version 4, Src: 192.168.193.128, Dst: 192.168.193.212

> User Datagram Protocol, Src Port: 68, Dst Port: 67

Source Port: 68

Destination Port: 67

Length: 324

Checksum: 0x05fc [unverified]

[Checksum Status: Unverified]

[Stream index: 31]

> [Timestamps]

UDP payload (316 bytes)

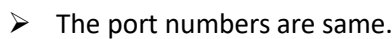
> Dynamic Host Configuration Protocol (Request)

[Community ID: 1:H33//E815/ETKG/411Y0A1zz7jo=]

0000	96	73	a6	e8	0f	77	7c	21	4a	e0	ce	eb	08	00	45	00	s...w|J.....E
0010	01	58	df	7d	00	00	00	11	00	00	c0	a8	c1	80	c0	a8	X}.....
0020	c1	d4	00	44	00	43	01	44	05	fc	01	01	00	00	7a	f3	..D.C.D.....z
0030	b9	65	00	00	00	00	00	00	00	c0	a8	c1	80	00	00	00	e.....|J.....
0040	00	00	00	00	00	00	7c	21	4a	e0	ce	eb	00	00	00	00	.....
0050	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
0060	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
0070	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
0080	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
0090	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
00a0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
00b0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
00c0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
00d0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
00e0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....
00f0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	.....

2. Draw a timing datagram illustrating the sequence of the first four-packet

Discover/Offer/Request/ACK DHCP exchange between the client and server. For each packet, indicated the source and destination port numbers. Are the port numbers the same as in the example given in this lab assignment?



➤ (7c:21:4a:e0:ce:eb)

1171	92.944574	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xda191b46
Option: (53) DHCP Message Type (Discover) Length: 1 DHCP: Discover (1)						0000 ff ff ff 4 0010 01 4a a5 e 0020 ff ff 00 4
469	42.886414	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0x7af3b965
Option: (53) DHCP Message Type (Request) Length: 1 DHCP: Request (3)						0000 96 73 a6 e 0010 01 58 df 7 0020 c1 d4 00 4 0030 b0 65 00 4

No.	Time	Source	Destination	Protocol	Length	Info
402	24.695343	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0xdb61ad2e
						Transaction ID: 0xdb61ad2e
403	24.708200	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0xdb61ad2e
						Transaction ID: 0xdb61ad2e
850	76.711537	192.168.193.128	192.168.193.212	DHCP	342	DHCP Release - Transaction ID 0xc2c7fc29
1171	92.944574	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xda191b46
<p>> Internet Protocol Version 4, Src: 192.168.193.128, Dst: 192.168.193.212</p> <p>> User Datagram Protocol, Src Port: 68, Dst Port: 67</p> <p>> Dynamic Host Configuration Protocol (Release)</p> <p>Message type: Boot Request (1)</p> <p>Hardware type: Ethernet (0x01)</p> <p>Hardware address length: 6</p> <p>Hops: 0</p> <p>Transaction ID: 0xc2c7fc29</p>						

No.	Time	Source	Destination	Protocol	Length	Info
850	76.711537	192.168.193.128	192.168.193.212	DHCP	342	DHCP Release - Transaction ID 0xc2c7fc29
1171	92.944574	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xda191b46

> Internet Protocol Version 4, Src: 0.0.0.0, Dst: 255.255.255.255	0000	ff ff ff f
> User Datagram Protocol, Src Port: 68, Dst Port: 67	0010	01 4a a5 e
▼ Dynamic Host Configuration Protocol (Discover)	0020	ff ff 00 4
Message type: Boot Request (1)	0030	1b 46 00 0
Hardware type: Ethernet (0x01)	0040	00 00 00 0
Hardware address length: 6	0050	00 00 00 0
Hops: 0	0060	00 00 00 0
Transaction ID: 0xda191b46	0070	00 00 00 0
	0080	00 00 00 0

➤ Second Set (Request/ACK)

No.	Time	Source	Destination	Protocol	Length	Info
469	42.886414	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0x7af3b965
470	42.898525	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0x7af3b965

> Internet Protocol Version 4, Src: 192.168.193.128, Dst: 192.168.193.212	0000	96 73 a6 e8 0f
> User Datagram Protocol, Src Port: 68, Dst Port: 67	0010	01 58 df 7d 00
▼ Dynamic Host Configuration Protocol (Request)	0020	c1 d4 00 44 00
Message type: Boot Request (1)	0030	b9 65 00 00 00
Hardware type: Ethernet (0x01)	0040	00 00 00 00 00
Hardware address length: 6	0050	00 00 00 00 00
Hops: 0	0060	00 00 00 00 00
Transaction ID: 0x7af3b965	0070	00 00 00 00 00
	0080	00 00 00 00 00

No.	Time	Source	Destination	Protocol	Length	Info
469	42.886414	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0x7af3b965
470	42.898525	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0x7af3b965

> Internet Protocol Version 4, Src: 192.168.193.212, Dst: 192.168.193.128	0000	7c 21 4a e0 ce
> User Datagram Protocol, Src Port: 67, Dst Port: 68	0010	01 52 9f 2a 40
▼ Dynamic Host Configuration Protocol (ACK)	0020	c1 80 00 43 00
Message type: Boot Reply (2)	0030	b9 65 00 00 00
Hardware type: Ethernet (0x01)	0040	c1 d4 00 00 00
Hardware address length: 6	0050	00 00 00 00 00
Hops: 0	0060	00 00 00 00 00
Transaction ID: 0x7af3b965	0070	00 00 00 00 00
	0080	00 00 00 00 00

- Transaction ID field is used to associate messages and responses between a client and a server.

6. A host uses DHCP to obtain an IP address, among other things. But a host's IP address is not confirmed until the end of the four-message exchange! If the IP address is not set until the end of the four-message exchange, then what values are used in the IP datagrams in the four-message exchange? For each of the four DHCP messages (Discover/Offer/Request/ACK DHCP), indicate the source and destination IP addresses that are carried in the encapsulating IP datagram.

1171	92.944574	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xda191b46
1172	92.954252	192.168.193.212	192.168.193.128	DHCP	352	DHCP Offer - Transaction ID 0xda191b46
1173	92.958383	0.0.0.0	255.255.255.255	DHCP	370	DHCP Request - Transaction ID 0xda191b46
1176	92.970329	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0xda191b46

7. What is the IP address of your DHCP server?

- 192.168.193.212

8. What IP address is the DHCP server offering to your host in the DHCP Offer message? Indicate which DHCP message contains the offered DHCP address.

1172	92.954252	192.168.193.212	192.168.193.128	DHCP	352 DHCP Offer	- Transaction ID 0xda191b46
Your (client) IP address: 192.168.193.128						
Next server IP address: 192.168.193.212						
Relay agent IP address: 0.0.0.0						
Client MAC address: IntelCor_e0:ce:eb (7c:21:4a:e0:ce:eb)						
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)						
					0000	7c 21 4a e0
					0010	01 52 b9 1e
					0020	c1 80 00 43
					0030	1b 46 00 00
					0040	c1 d4 00 00
					0050	00 00 00 00
					0060	00 00 00 00
					0070	00 00 00 00
					0080	00 00 00 00
					0090	00 00 00 00
					00a0	00 00 00 00
					00b0	00 00 00 00

9. In the example screenshot in this assignment, there is no relay agent between the host and the DHCP server. What values in the trace indicate the absence of a relay agent? Is there a relay agent in your experiment? If so what is the IP address of the agent?

1176	92.970329	192.168.193.212	192.168.193.128	DHCP	352 DHCP ACK	- Transaction ID 0xda191b46
Relay agent IP address: 0.0.0.0						
Client MAC address: IntelCor_e0:ce:eb (7c:21:4a:e0:ce:eb)						
					0000	7c 21 4a
					0010	01 52 b9

- No Relay Agent in the experiment.

10. Explain the purpose of the router and subnet mask lines in the DHCP offer message.

- Option: (1) Subnet Mask (255.255.255.0)
 - Length: 4
 - Subnet Mask: 255.255.255.0
- Option: (28) Broadcast Address (192.168.193.255)
 - Length: 4
 - Broadcast Address: 192.168.193.255
- Option: (3) Router
 - Length: 4
 - Router: 192.168.193.212

- Which subnet mask should be used is specified on the subnet mask line for the client.

12. Explain the purpose of the lease time. How long is the lease time in your experiment?

- Option: (51) IP Address Lease Time
 - Length: 4
 - IP Address Lease Time: (3599s) 59 minutes, 59 seconds

- The purpose of this is the amount of time the DHCP server assigns an IP address to a client.

13. What is the purpose of the DHCP release message? Does the DHCP server issue an acknowledgment of receipt of the client's DHCP request? What would happen if the client's DHCP release message is lost?

- A DHCP release message is sent by the client to cancel the lease on an IP address given to it by the DHCP server.

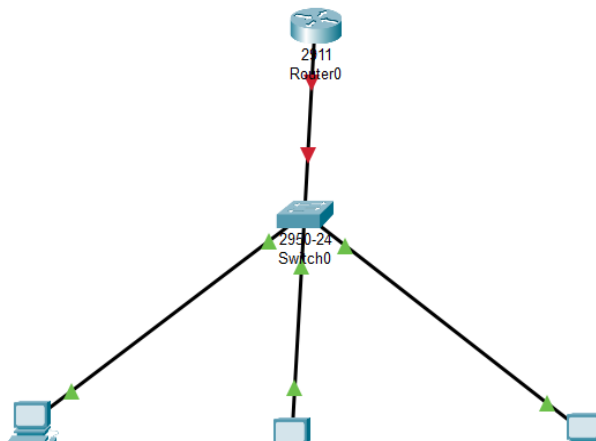
14. Clear the bootp filter from your Wireshark window. Were any ARP packets sent or received during the DHCP packet-exchange period? If so, explain the purpose of those ARP packets.

No.	Time	Source	Destination	Protocol	Length	Info
402	24.695343	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0xdb61ad2e
403	24.708200	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0xdb61ad2e
469	42.886414	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0x7af3b965
470	42.898525	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0x7af3b965
850	76.711537	192.168.193.128	192.168.193.212	DHCP	342	DHCP Release - Transaction ID 0xc2c7fc29
1171	92.944574	0.0.0.0	255.255.255.255	DHCP	344	DHCP Discover - Transaction ID 0xda191b46
1172	92.954252	192.168.193.212	192.168.193.128	DHCP	352	DHCP Offer - Transaction ID 0xda191b46
1173	92.958383	0.0.0.0	255.255.255.255	DHCP	370	DHCP Request - Transaction ID 0xda191b46
1176	92.970329	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0xda191b46
1450	99.194343	192.168.193.128	192.168.193.212	DHCP	358	DHCP Request - Transaction ID 0x772cb930
1451	99.207313	192.168.193.212	192.168.193.128	DHCP	352	DHCP ACK - Transaction ID 0x772cb930

No.	Time	Source	Destination	Protocol	Length	Info
272	4.079655	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
273	4.085454	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
344	14.594828	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
345	14.594849	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	192.168.193.128 is at 7c:21:4a:e0:ce:eb
422	26.582288	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
423	26.589002	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
430	29.963961	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
439	29.963986	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	192.168.193.128 is at 7c:21:4a:e0:ce:eb
505	47.988593	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
506	47.988626	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	192.168.193.128 is at 7c:21:4a:e0:ce:eb
677	64.573792	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
678	64.579816	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
905	79.218768	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
912	80.245977	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
934	81.270848	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
964	83.577781	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 169.254.228.153? (ARP Probe)
983	84.572662	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 169.254.228.153? (ARP Probe)
1010	85.582737	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 169.254.228.153? (ARP Probe)
1021	86.581958	IntelCor_e0:ce:eb	Broadcast	ARP	42	ARP Announcement for 169.254.228.153
1072	88.571170	IntelCor_e0:ce:eb	Broadcast	ARP	42	ARP Announcement for 169.254.228.153
1188	93.054952	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
1189	93.059551	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
1192	93.075176	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 192.168.193.128? (ARP Probe)
1201	93.117814	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
1202	93.122666	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
1235	93.374260	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
1240	93.382396	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
1309	94.075662	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 192.168.193.128? (ARP Probe)
1333	95.080757	IntelCor_e0:ce:eb	Broadcast	ARP	42	Who has 192.168.193.128? (ARP Probe)
1367	96.069512	IntelCor_e0:ce:eb	Broadcast	ARP	42	ARP Announcement for 192.168.193.128
1413	98.080786	IntelCor_e0:ce:eb	Broadcast	ARP	42	ARP Announcement for 192.168.193.128
1417	98.147071	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212
1418	98.147096	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	192.168.193.128 is at 7c:21:4a:e0:ce:eb
1448	99.069135	IntelCor_e0:ce:eb	96:73:a6:e8:0f:77	ARP	42	Who has 192.168.193.212? Tell 192.168.193.128
1449	99.072662	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	192.168.193.212 is at 96:73:a6:e8:0f:77
1767	104.291661	96:73:a6:e8:0f:77	IntelCor_e0:ce:eb	ARP	42	Who has 192.168.193.128? Tell 192.168.193.212

3. Experiment2:-

1. Implement following topology in packet tracer
2. Set ip address of router as 192.168.1.1/24.
3. Turn on port of router
4. Run following code in router configuration
5. Also add following commands in router configuration
Router(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.10
6. Configure all PCs as following:
7. (a) Click PC1->Desktop->IP configuration. Then enable DHCP
8. Check which ip addresses are assigned to pc by DHCP server

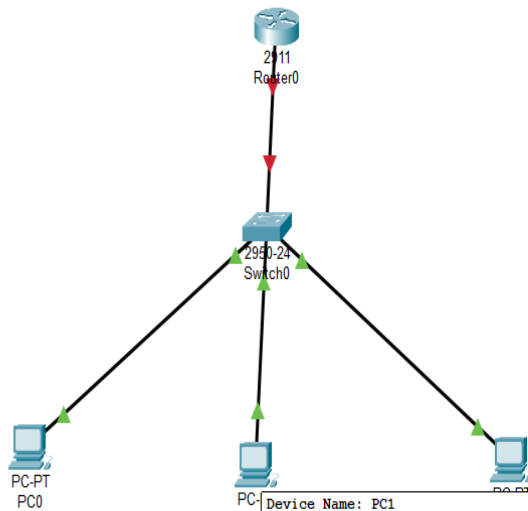


PC Device Name: PC0
 P Device Model: PC-PT

Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0	Up	169.254.102.103/16	<not set>	000A.41BE.6667
Bluetooth	Down	<not set>	<not set>	000C.8584.516E

Gateway: <not set>
 DNS Server: <not set>
 Line Number: <not set>

Physical Location: Intercity > Home City > Corporate Office > PC0



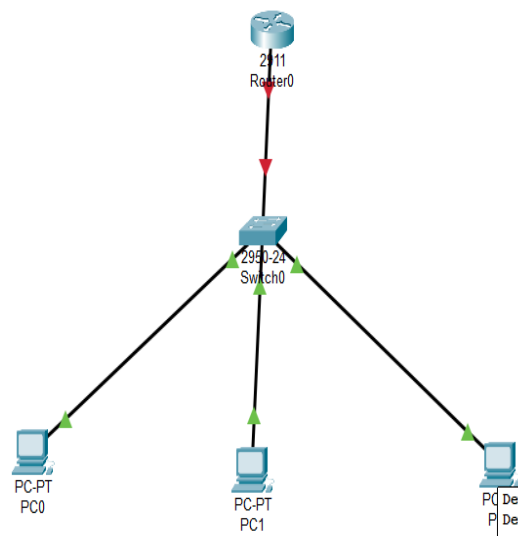
PC-PT PC0
 PC-PT PC1
 PC-PT PC2

Device Name: PC1
 Device Model: PC-PT

Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0	Up	169.254.237.212/16	<not set>	0001.9773.EDD4
Bluetooth	Down	<not set>	<not set>	0060.3E92.556A

Gateway: <not set>
 DNS Server: <not set>
 Line Number: <not set>

Physical Location: Intercity > Home City > Corporate Office > PC1



PC Device Name: PC2				
P Device Model: PC-PT				
Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0	Up	169.254.125.226/16	<not set>	0090.2BDC.7DE2
Bluetooth	Down	<not set>	<not set>	00E0.A3ED.CCB3
Gateway: <not set>				
DNS Server: <not set>				
Line Number: <not set>				
Physical Location: Intercity > Home City > Corporate Office > PC2				