Pandit Deendayal Energy University
School of Technology
Department of ICT
Academic Year: 2022-23
Computer Communication and Networking Lab
20IC306P

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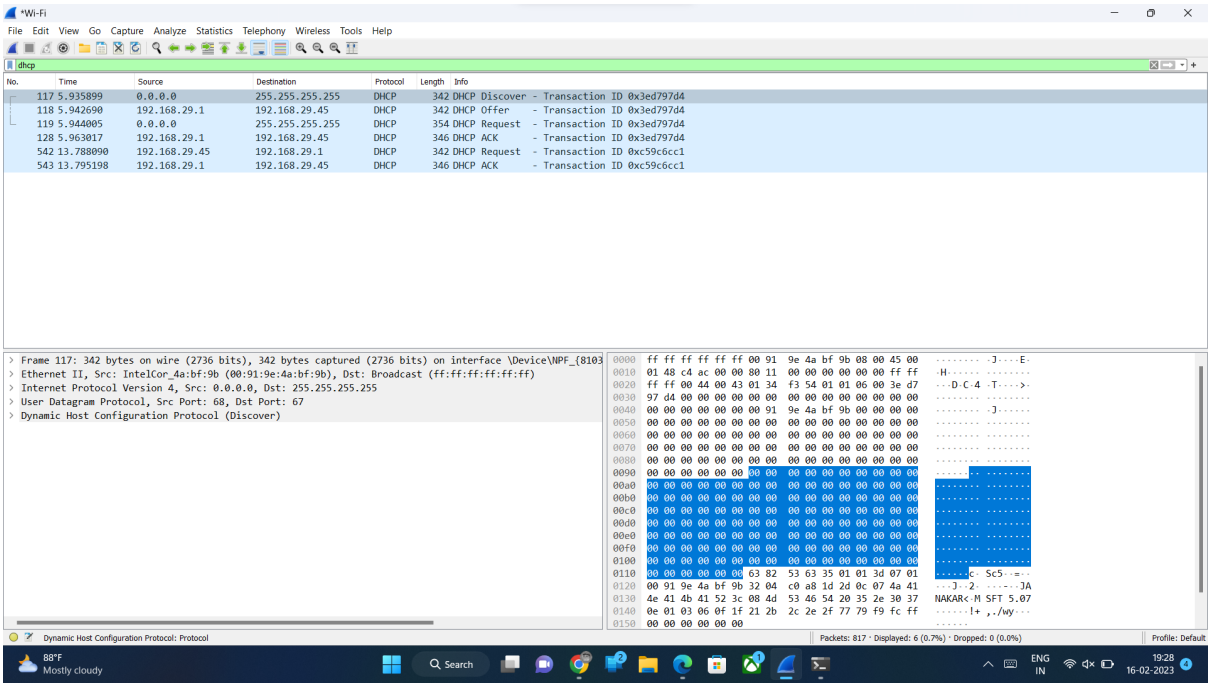
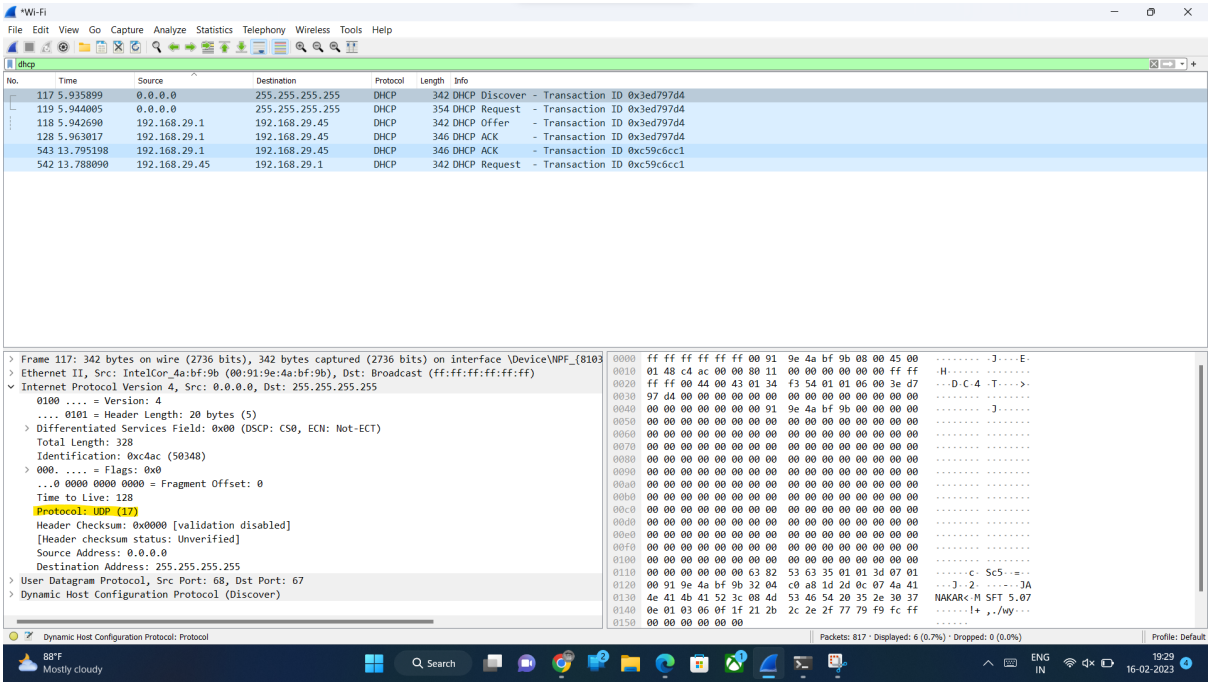
Roll No: 20BIT061

Experiment 5:

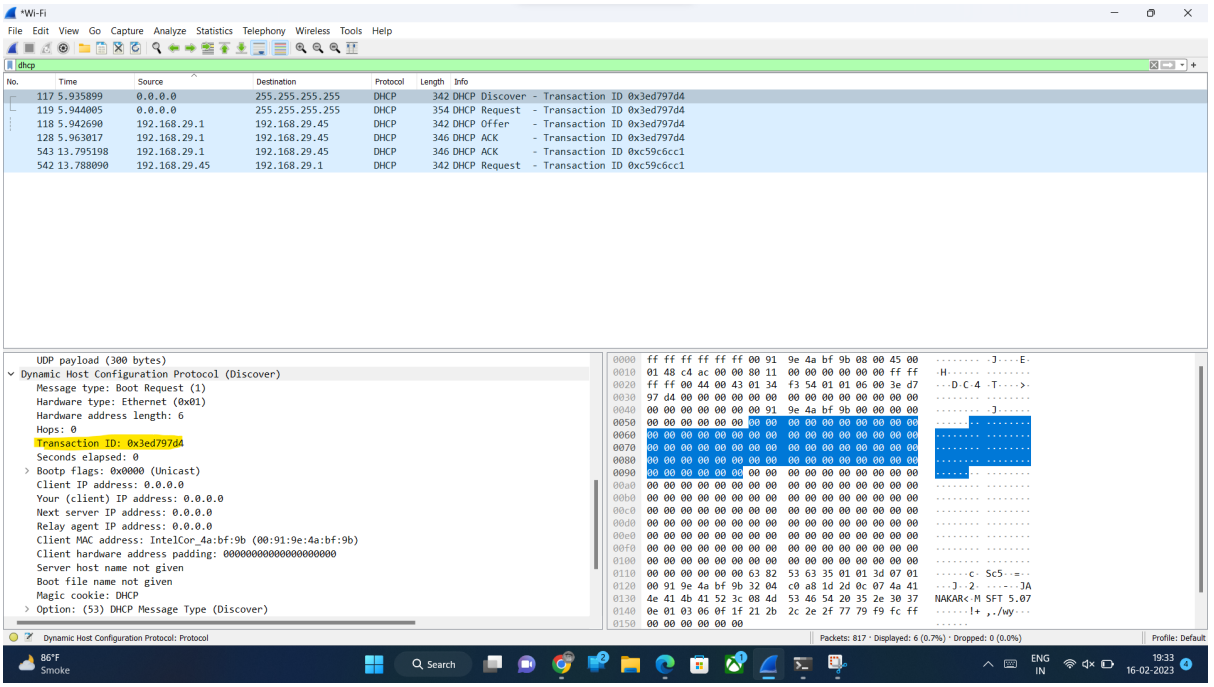
Aim: To understand the working of DHCP by using wire shark and packet tracer.
Software Tools required: - Wire-shark and Cisco packet tracer



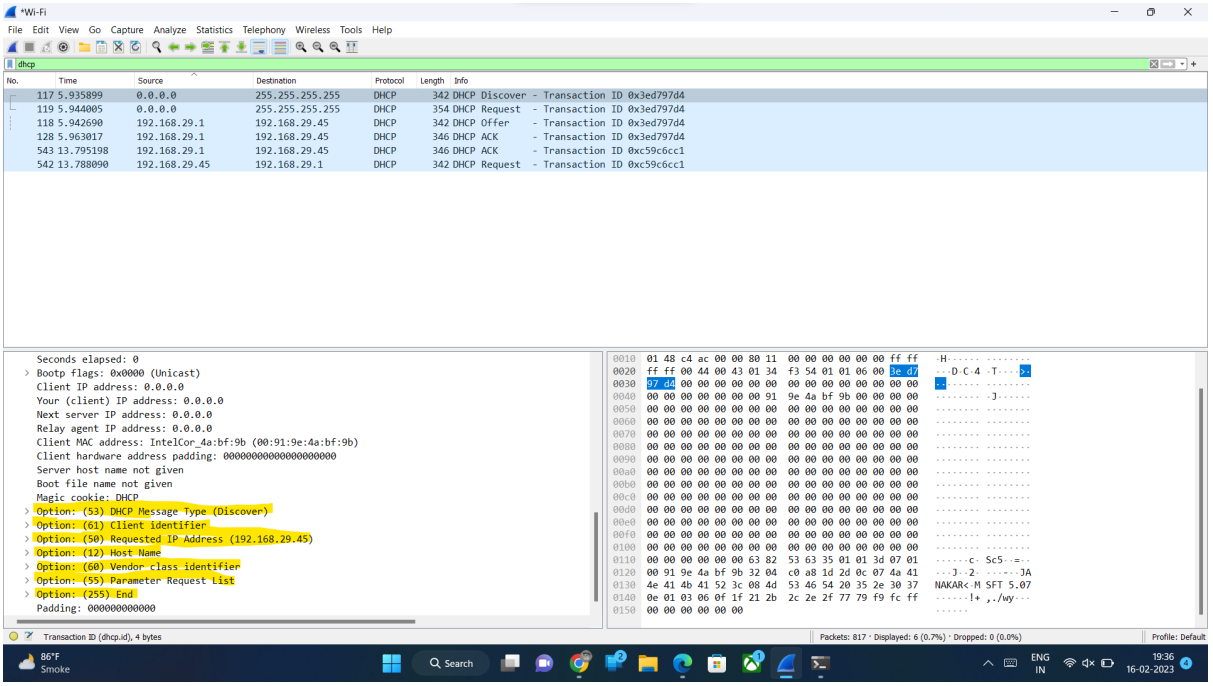
1. Is this DHCP Discover message sent out using UDP or TCP as the underlying transport protocol?
   Ans: It is using UDP protocol.



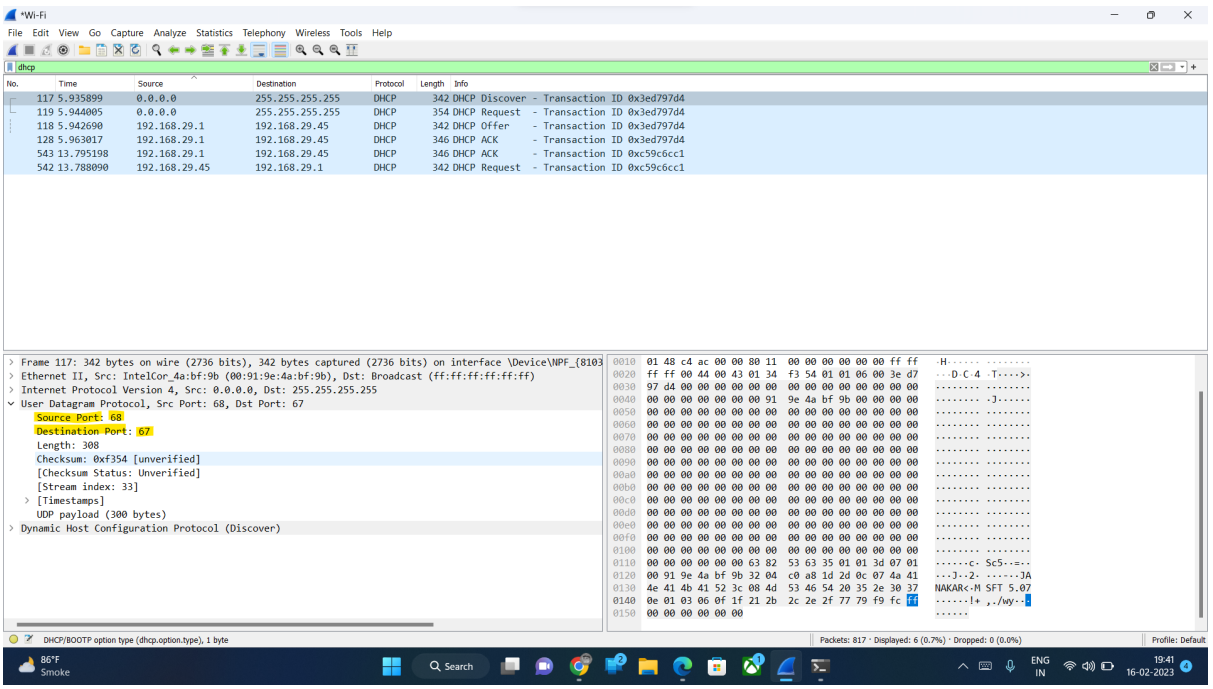
2. What is the source IP address used in the IP datagram containing the Discover message? Is there anything special about this address? Explain.
   Ans:
   Source IP address is 0.0.0.0
3. What is the destination IP address used in the datagram containing the Discover message. Is there anything special about this address? Explain.
   Ans:
   Destination IP address is 255.255.255.255
4. What is the value in the transaction ID field of this DHCP Discover message?
   Ans:
   Transaction ID is 0x3ed797d4

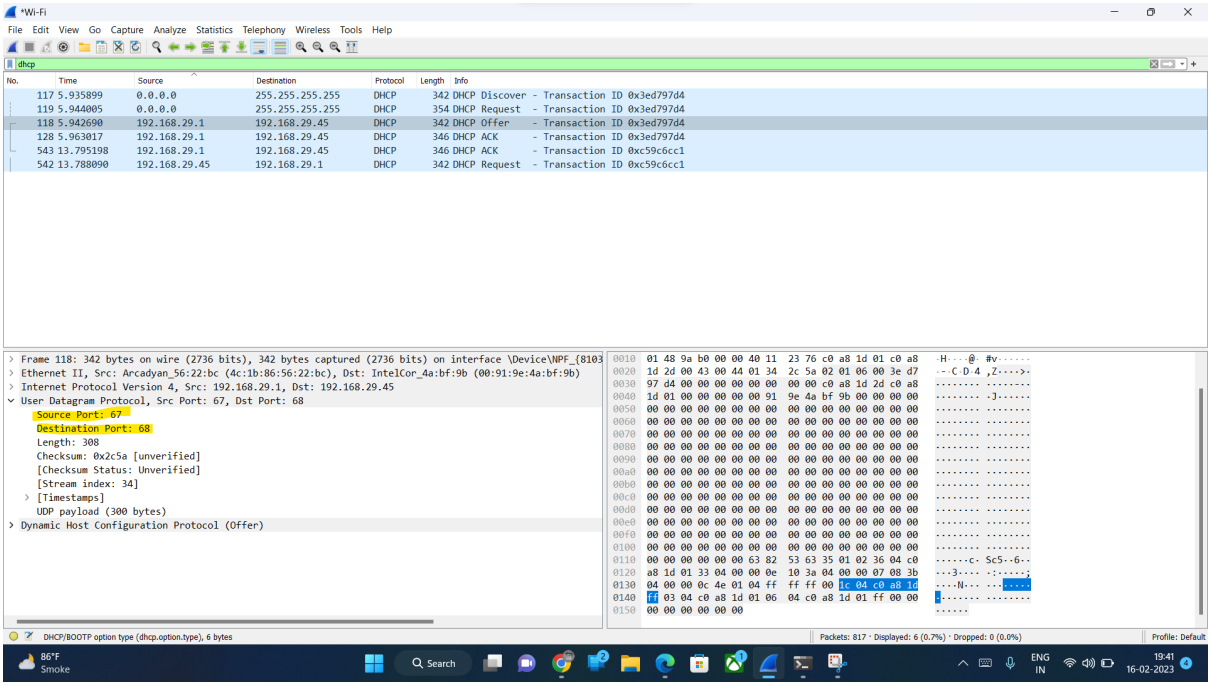


5. Now inspect the options field in the DHCP Discover message. What are five pieces of information (beyond an IP address) that the client is suggesting or requesting to receive from the DHCP server as part of this DHCP transaction?
   Ans:

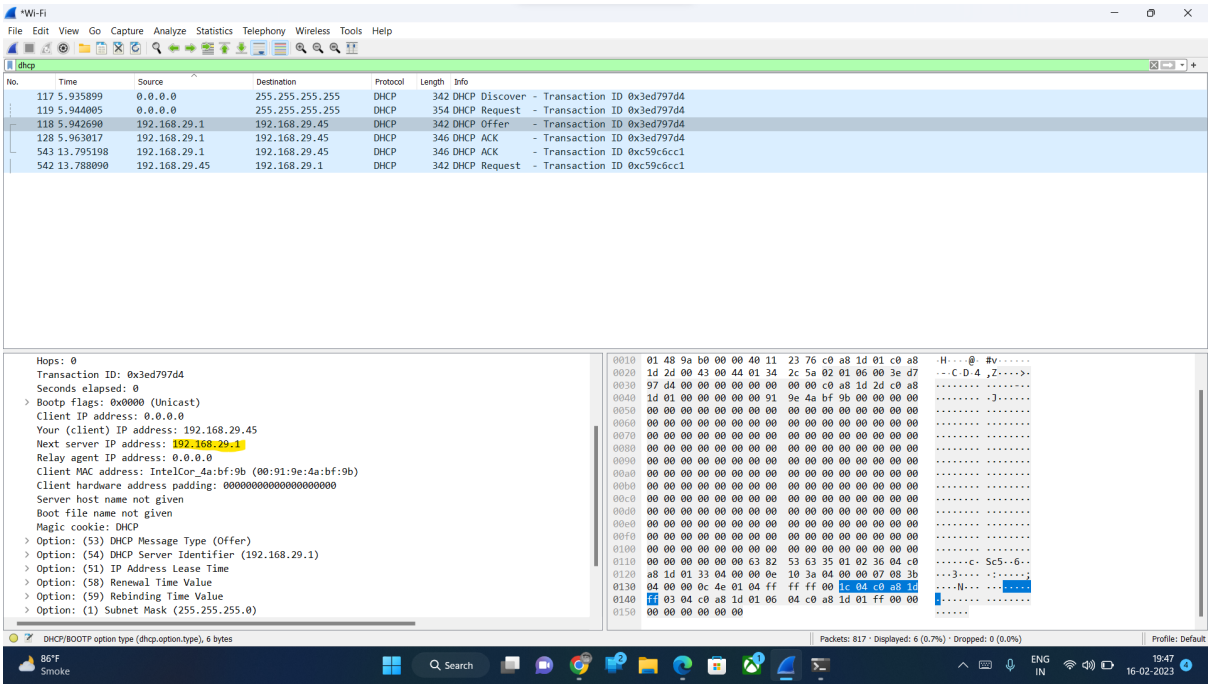


6. How do you know that this Offer message is being sent in response to the DHCP Discover message you studied in questions 1-5 above?
   Ans: Source and destination port number are interchange for both types of message.

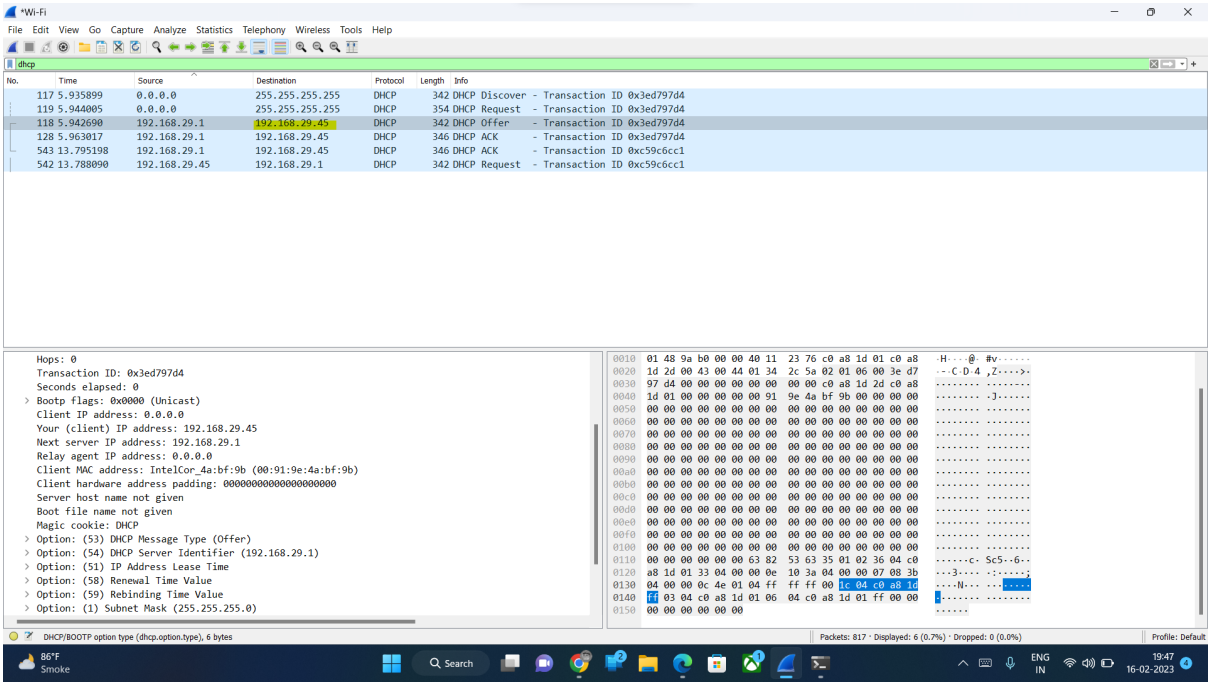




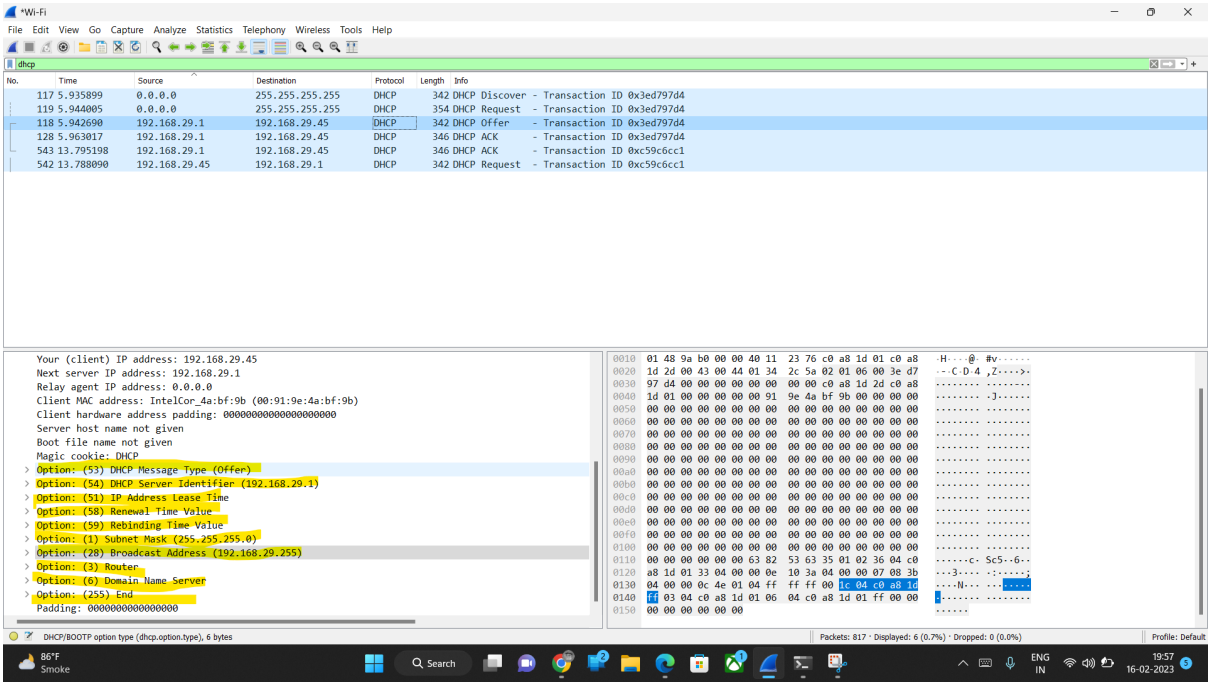
7. What is the *source* IP address used in the IP datagram containing the Offer message? Is there anything special about this address? Explain.
   Ans: IP Address is 192.168.29.1



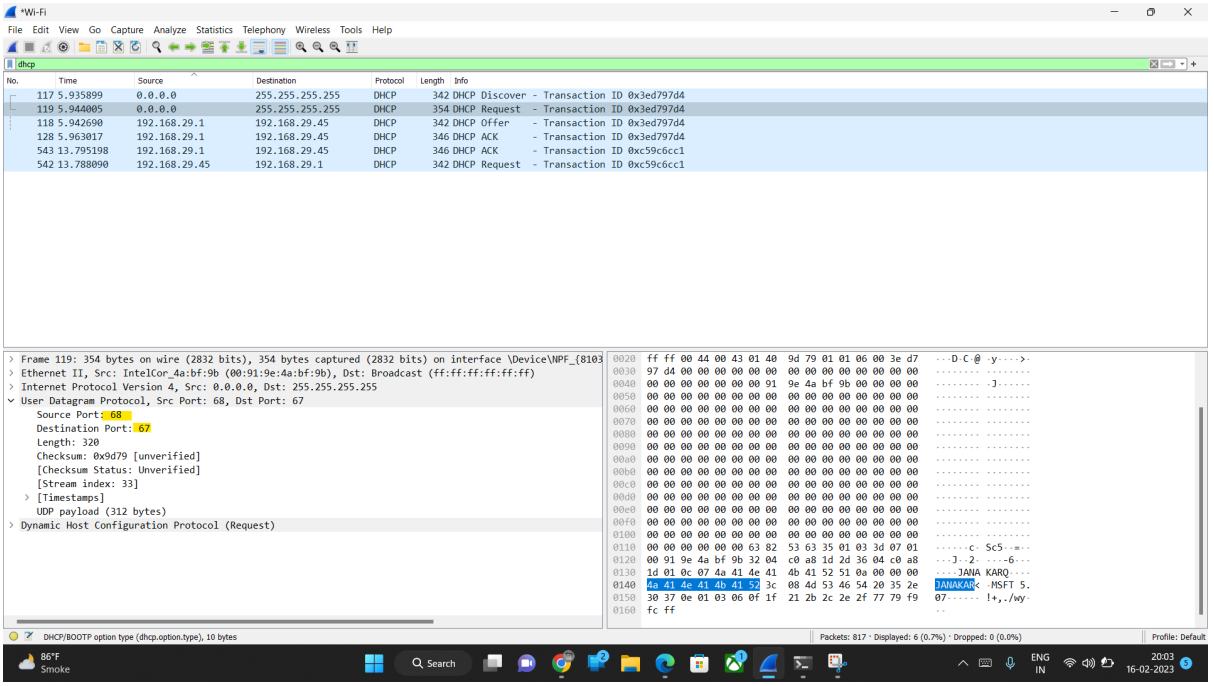
8. What is the *destination* IP address used in the datagram containing the Offer message? Is there anything special about this address? Explain. [Hint: Look at your trace carefully. The answer to this question may differ from what you see in Figure 4.24 in the textbook. If you really want to dig into this, consult the DHCP RFC, page 24.]
   Ans: IP address is 192.168.29.45



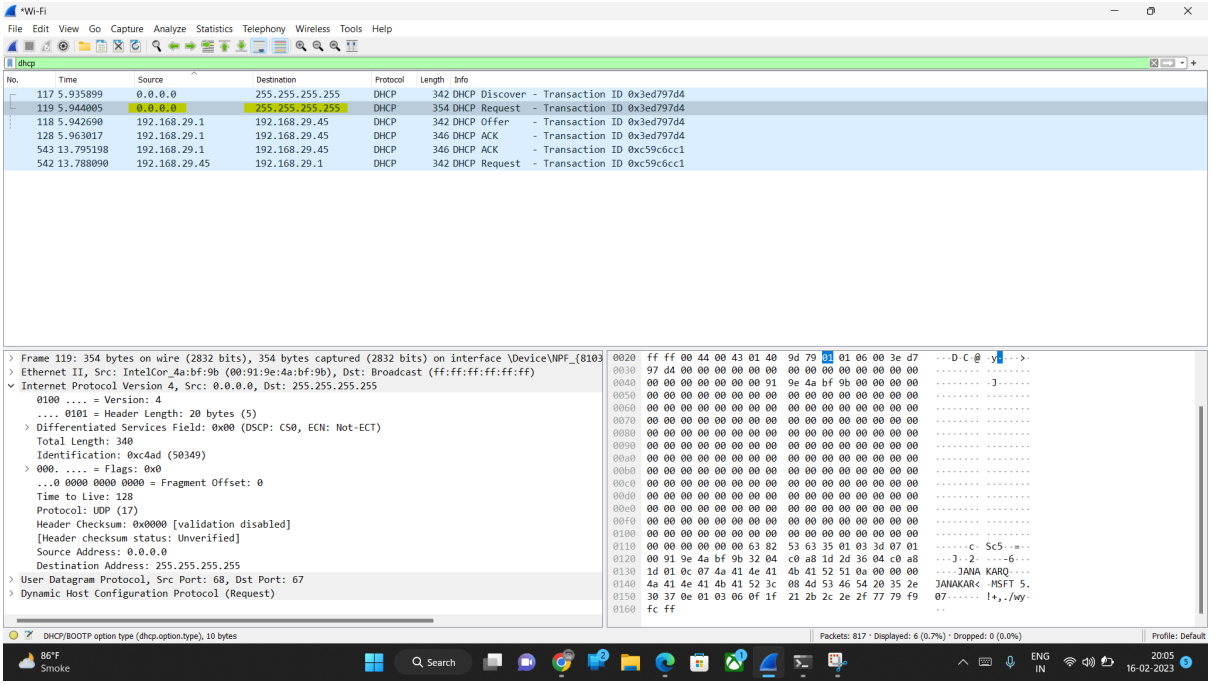
9. Now inspect the options field in the DHCP Offer message. What are five pieces of information that the DHCP server is providing to the DHCP client in the DHCP Offer message?
Ans:



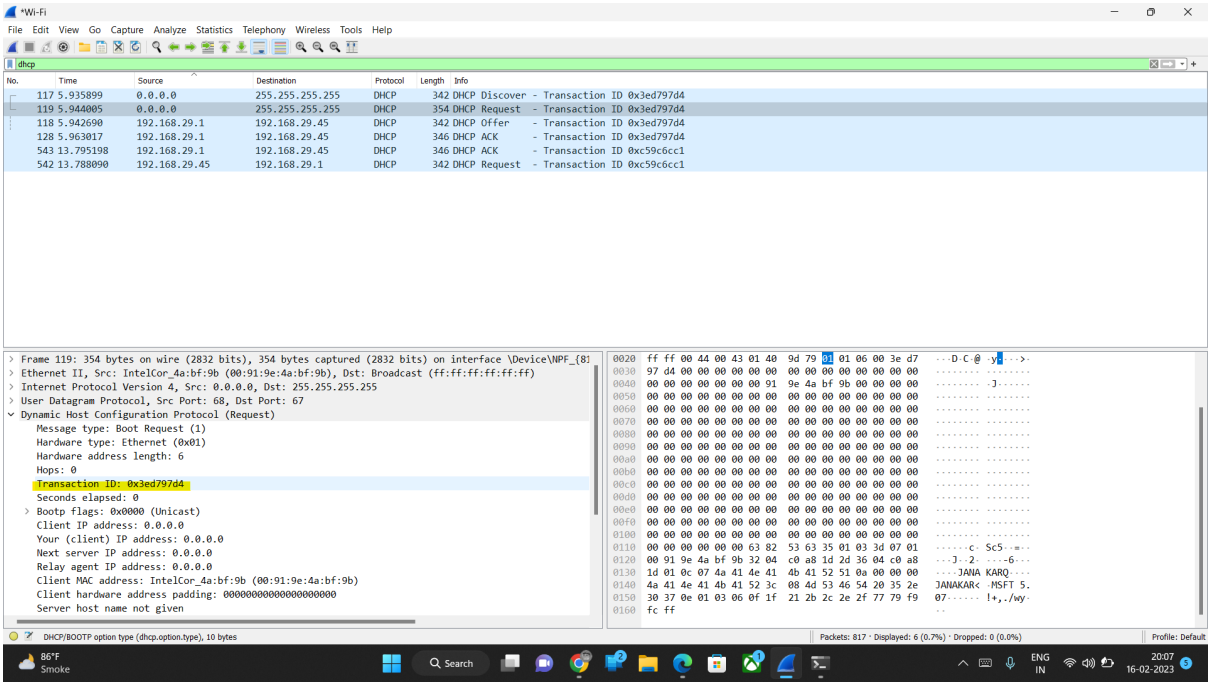
10. What is the UDP source port number in the IP datagram containing the first DHCP Request message in your trace? What is the UDP destination port number being used?
Ans: Source port is 68 and destination is 67



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



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?
    Ans: Transaction ID is 0x3ed797d4. Yes all the transaction ID is same

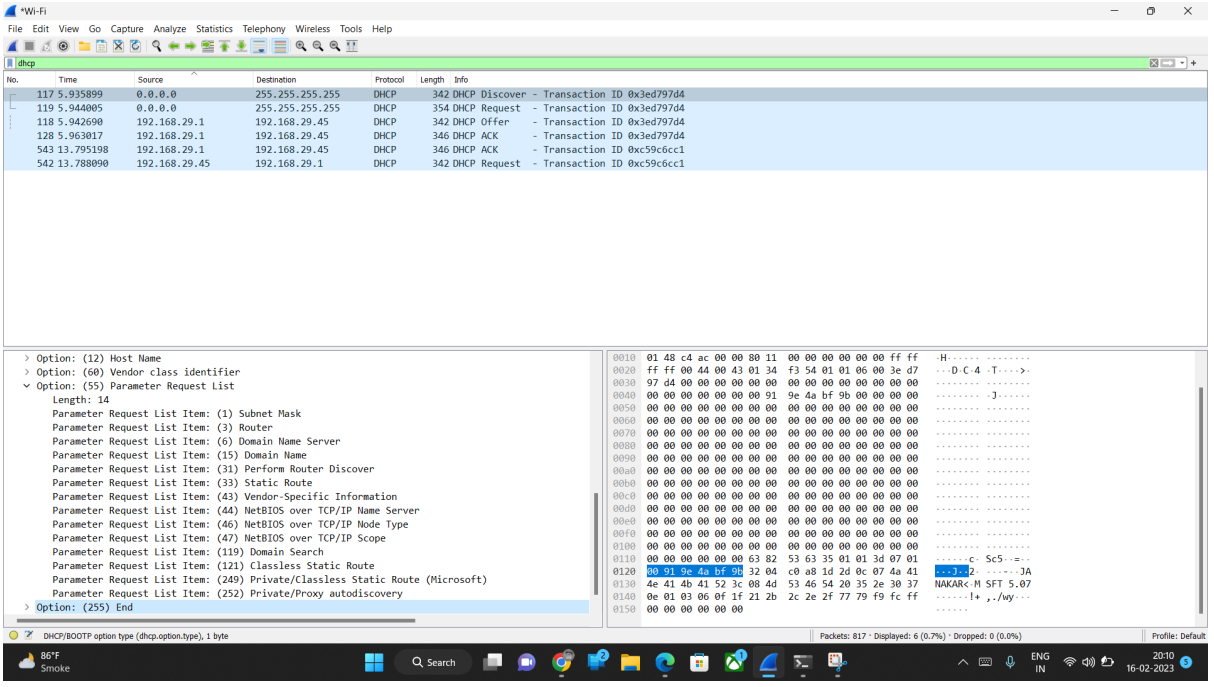


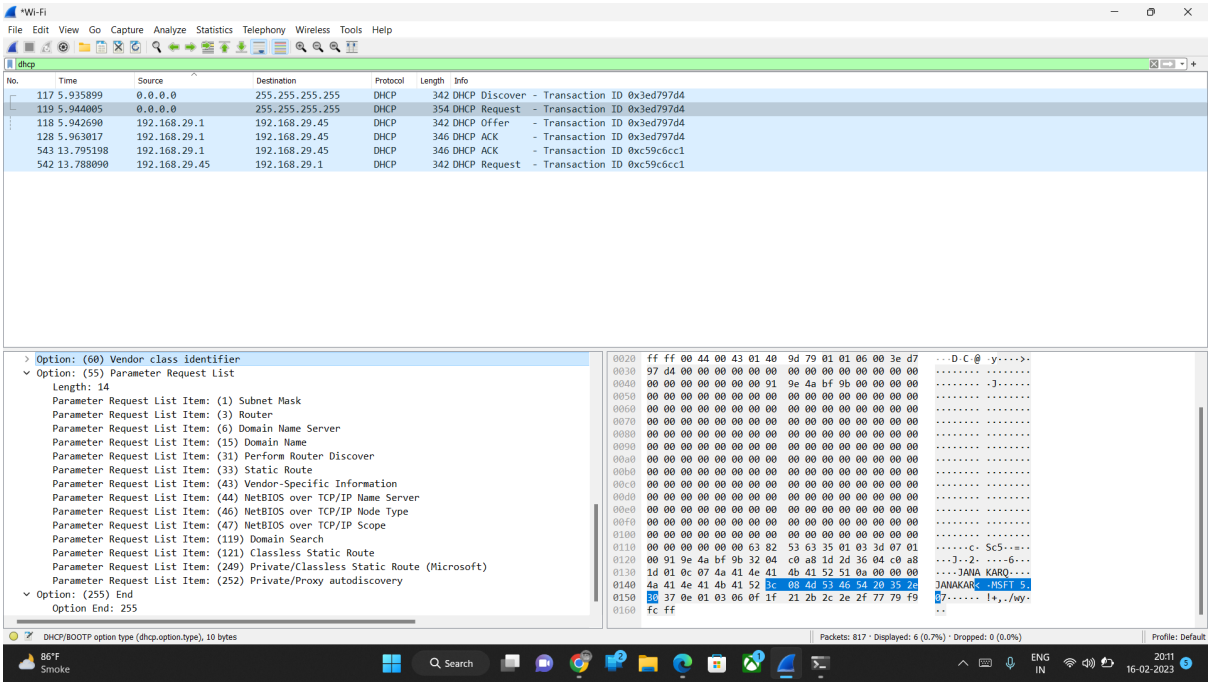
14. Now inspect the options field in the DHCP Discover message and take a close look at the "Parameter Request List". The DHCP RFC notes that

> "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."

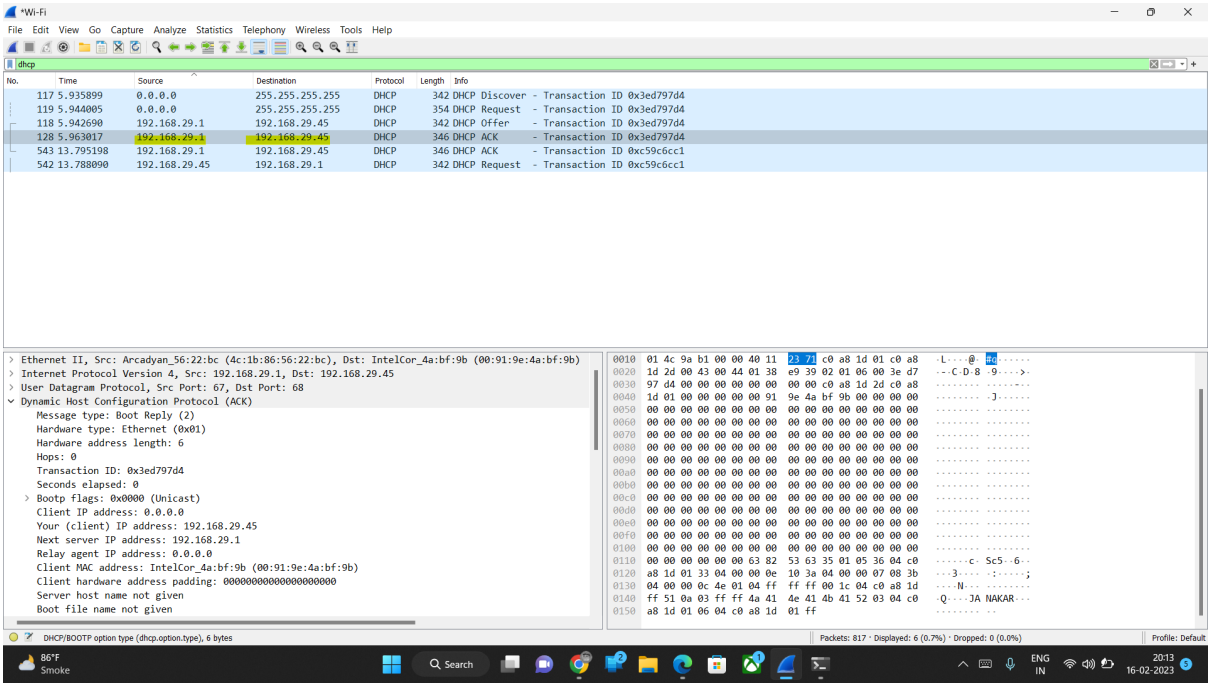
What differences do you see between the entries in the 'parameter request list' option in this Request message and the same list option in the earlier Discover message?

Ans: There is no difference between the lists of discover and request message.

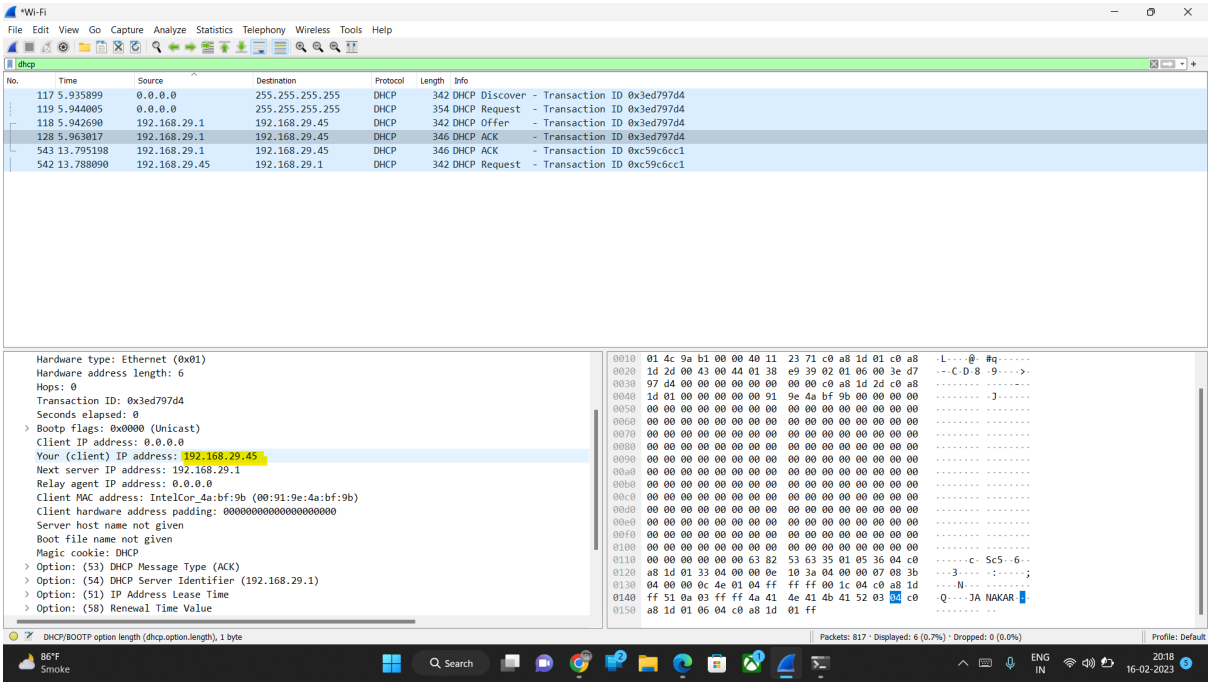




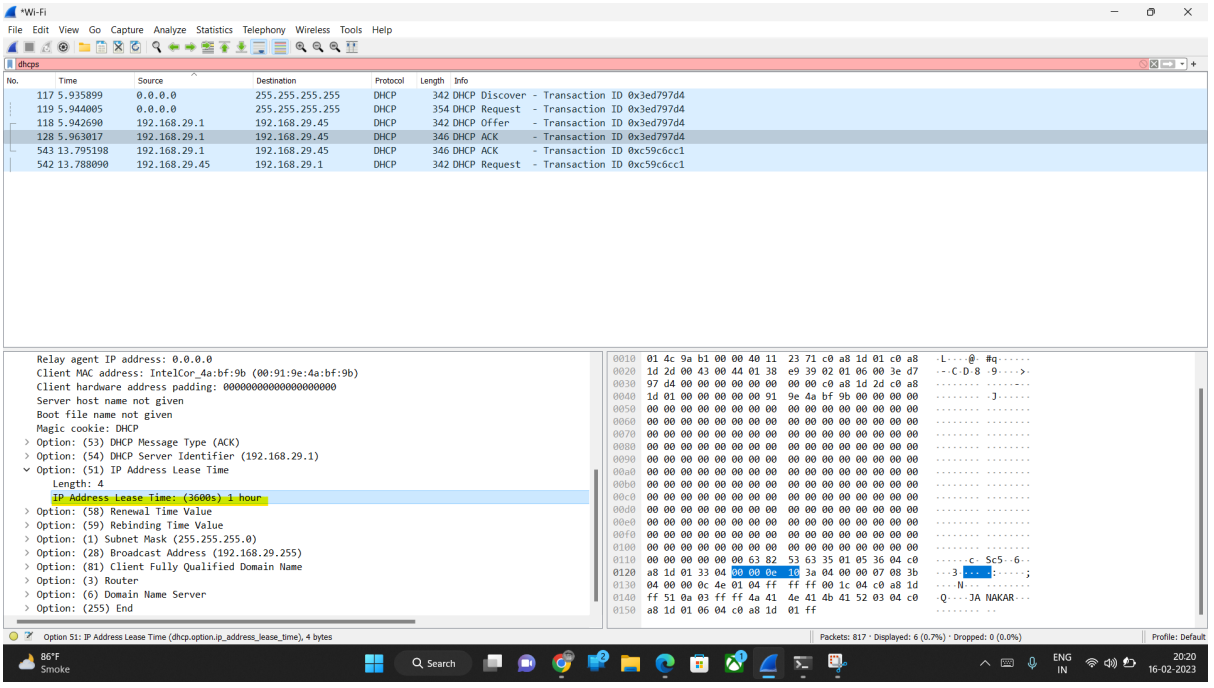
15. What is the source IP address in the IP datagram containing this ACK message? Is there anything special about this address? Explain.
16. What is the destination IP address used in the datagram containing this ACK message. Is there anything special about this address? Explain.
    Ans: The source IP Address is 192.168.29.1 and Destination IP address is 192.168.29.45



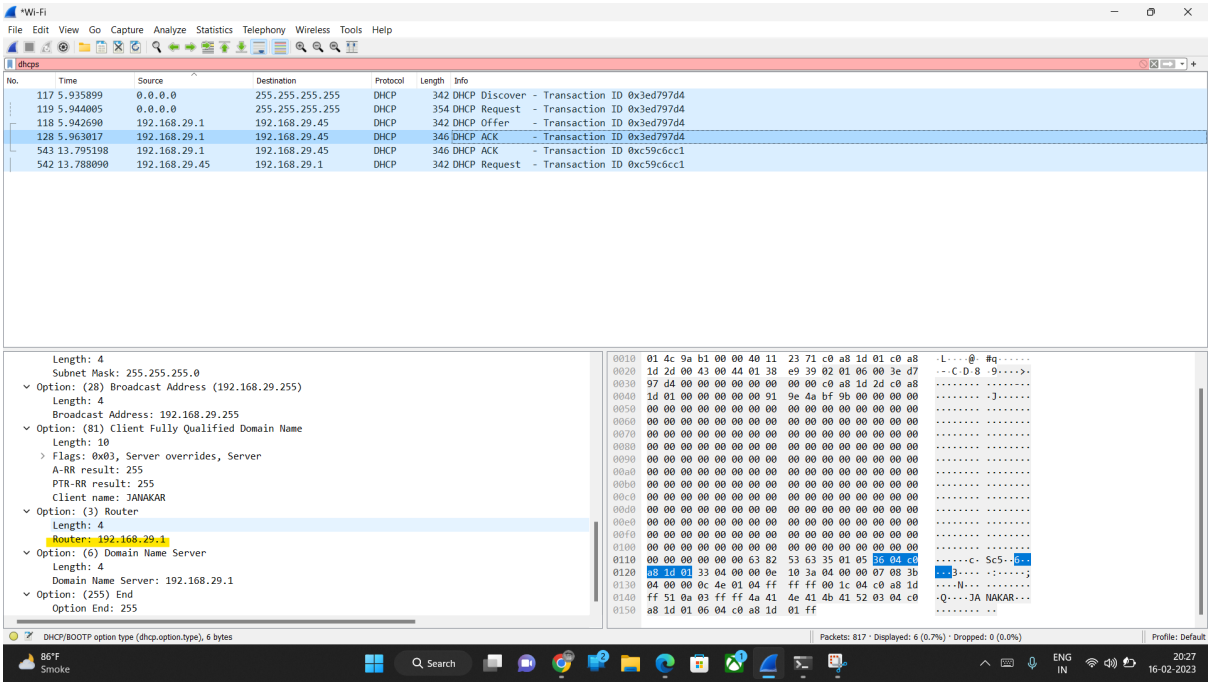
16. What is the name of the field in the DHCP ACK message (as indicated in the Wireshark window) that contains the assigned client IP address?
    Ans: IP address is 192.168.29.45



17. For how long a time (the so-called “lease time”) has the DHPC server assigned this IP address to the client?
    Ans: It takes 1 hour time lease time.

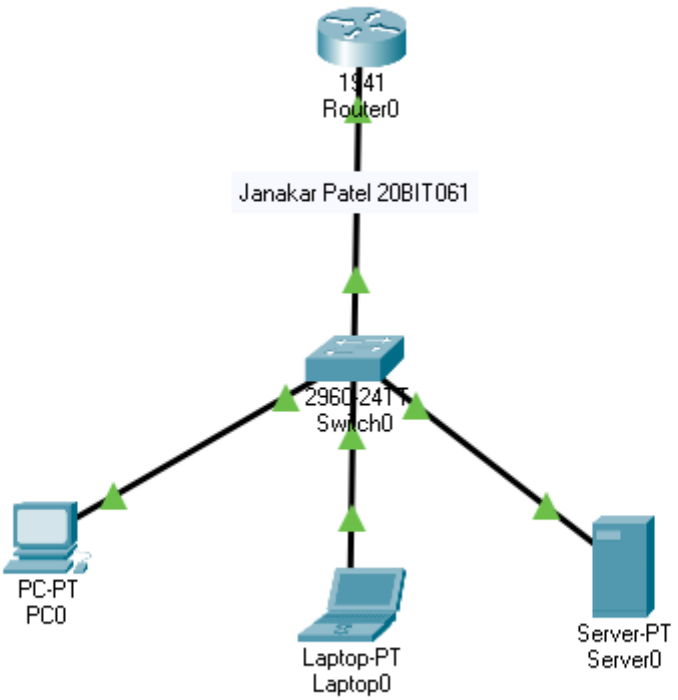


18. What is the IP address (returned by the DHCP server to the DHCP client in this DHCP ACK message) of the first-hop router on the default path from the client to the rest of the Internet?
    Ans: IP address is 192.198.29.1



Task 2: Configure a DHCP server in packet tracer by using the following link.

https://www.youtube.com/watch?v=Pbu0rbCNJrA




```
System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)

Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2010 by cisco Systems, Inc.
Total memory size = 512 MB - On-board = 512 MB, DIMM0 = 0 MB
CISCO1941/K9 platform with 524288 Kbytes of main memory
Main memory is configured to 64/-1(On-board/DIMM0) bit mode with ECC disabled

Readonly ROMMON initialized

program load complete, entry point: 0x80803000, size: 0x1b340
program load complete, entry point: 0x80803000, size: 0x1b340

IOS Image Load Test
___________________
Digitally Signed Release Software
program load complete, entry point: 0x81000000, size: 0x2bb1c58
Self decompressing the image :
######################################################################## [OK]
Smart Init is enabled
smart init is sizing iomem
TYPE MEMORY_REQ
Onboard devices &
buffer pools 0x01E8F000
-----------------------------------------------
TOTAL: 0x01E8F000
Rounded IOMEM up to: 32Mb.
Using 6 percent iomem. [32Mb/512Mb]

Restricted Rights Legend
Use, duplication, or disclosure by the Government is
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subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134-1706

Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4,
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2012 by Cisco Systems, Inc.
Compiled Thurs 5-Jan-12 15:41 by pt_team
Image text-base: 0x2100F918, data-base: 0x24729040

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)


--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no


Press RETURN to get started!



Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state
to up

Router(config-if)#exit
Router(config)#ip dhcp pool ABC-POOL
```
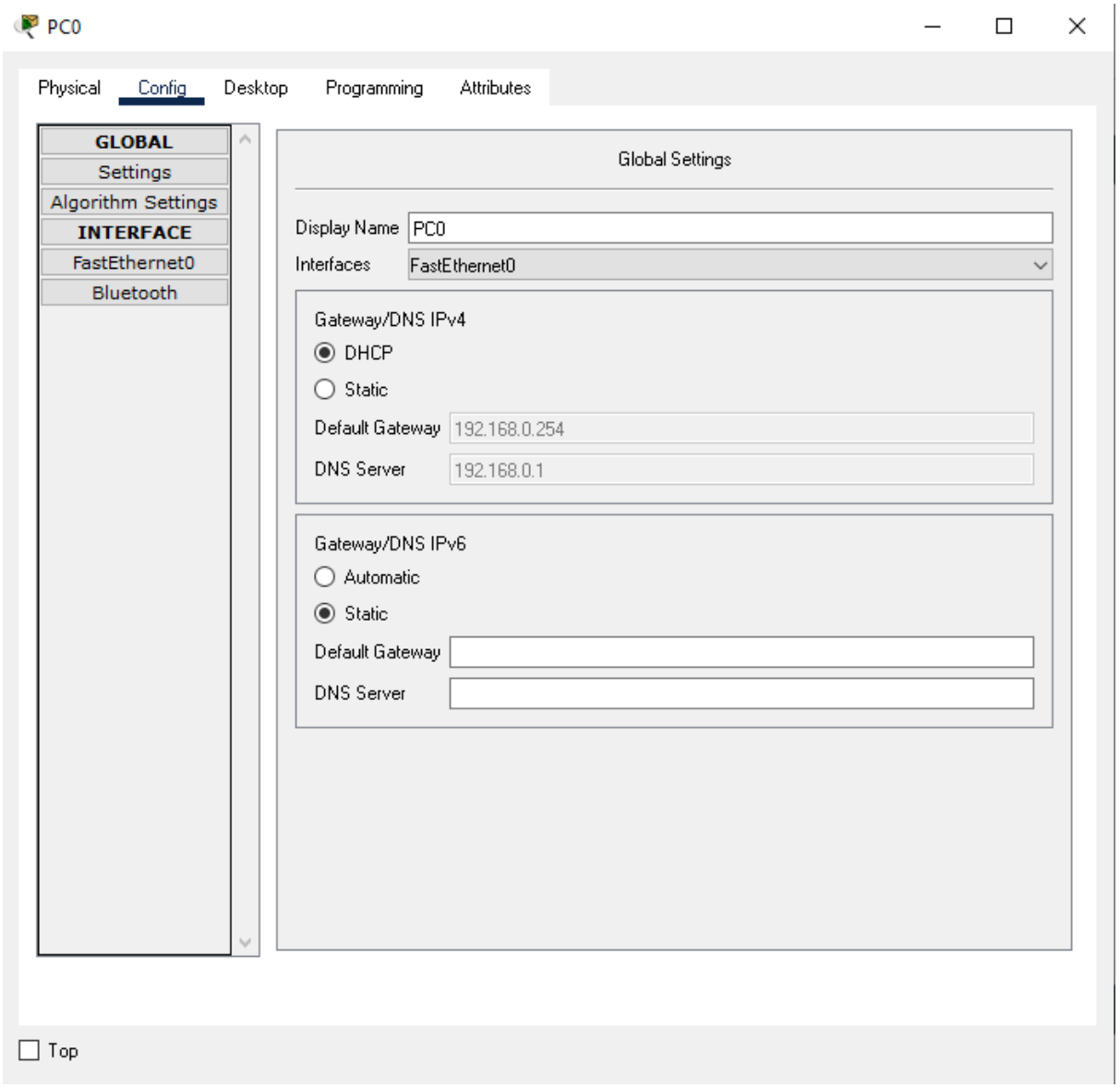
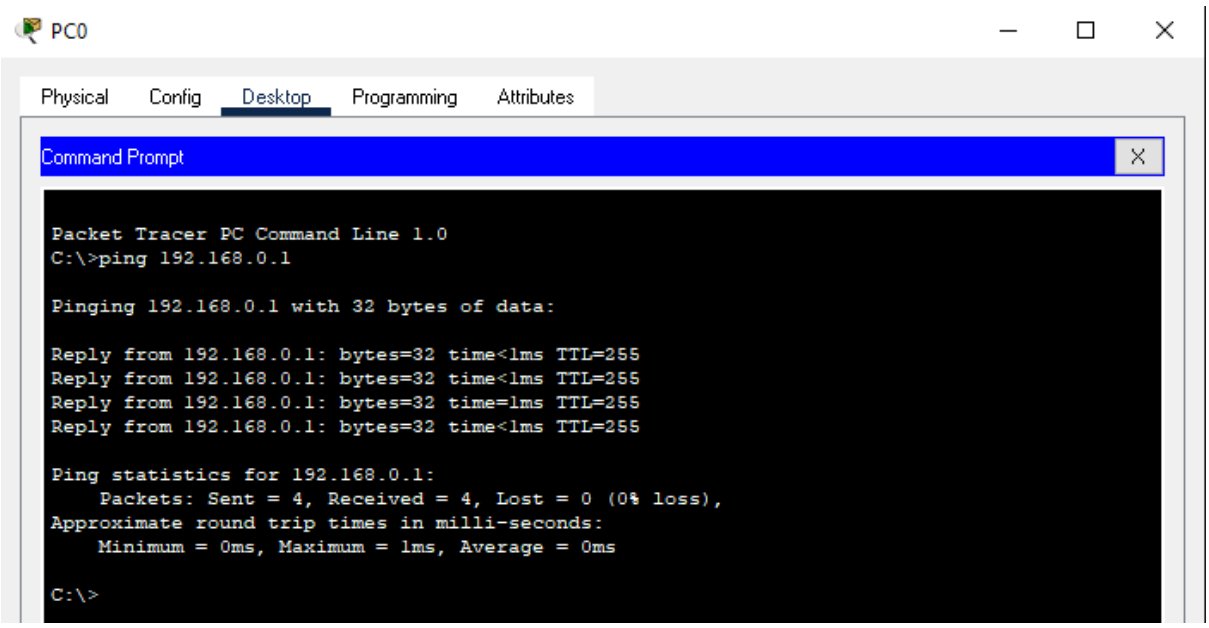
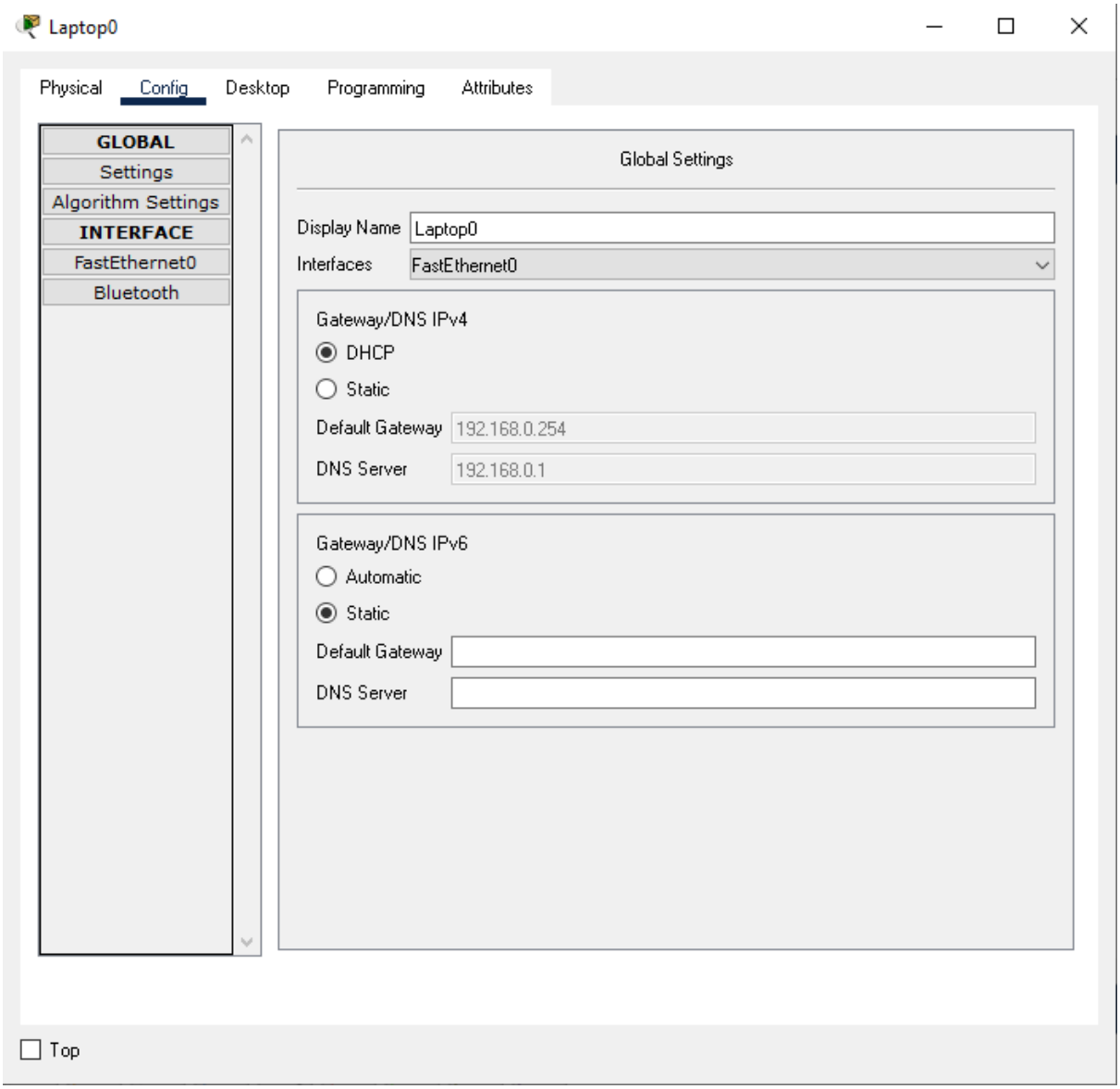
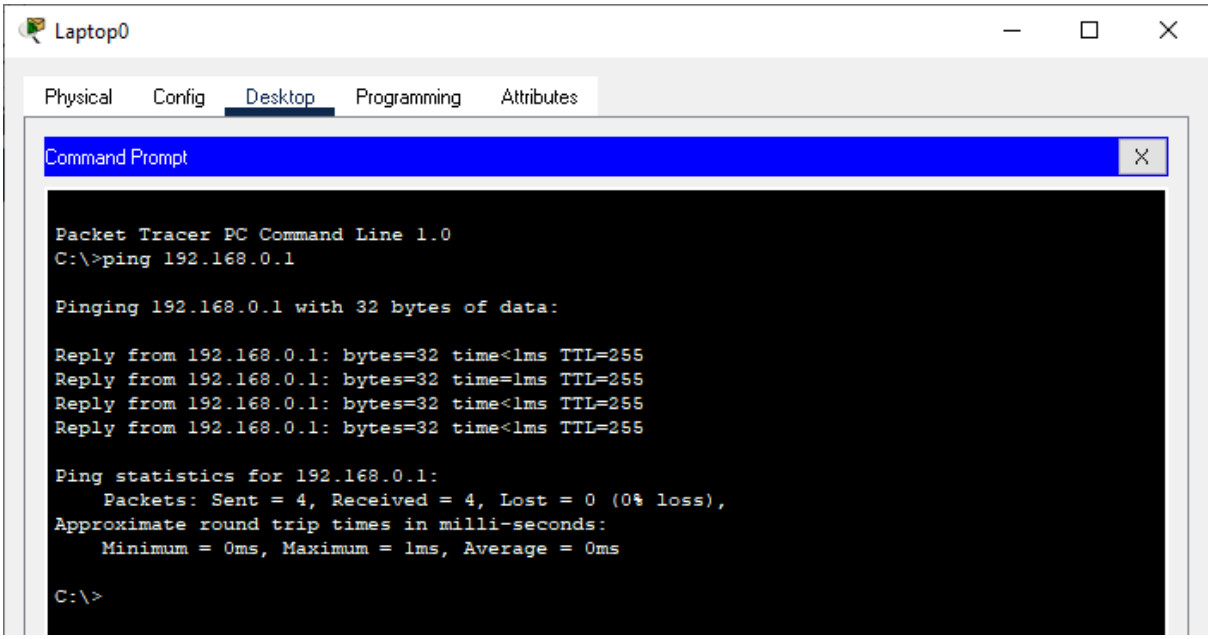
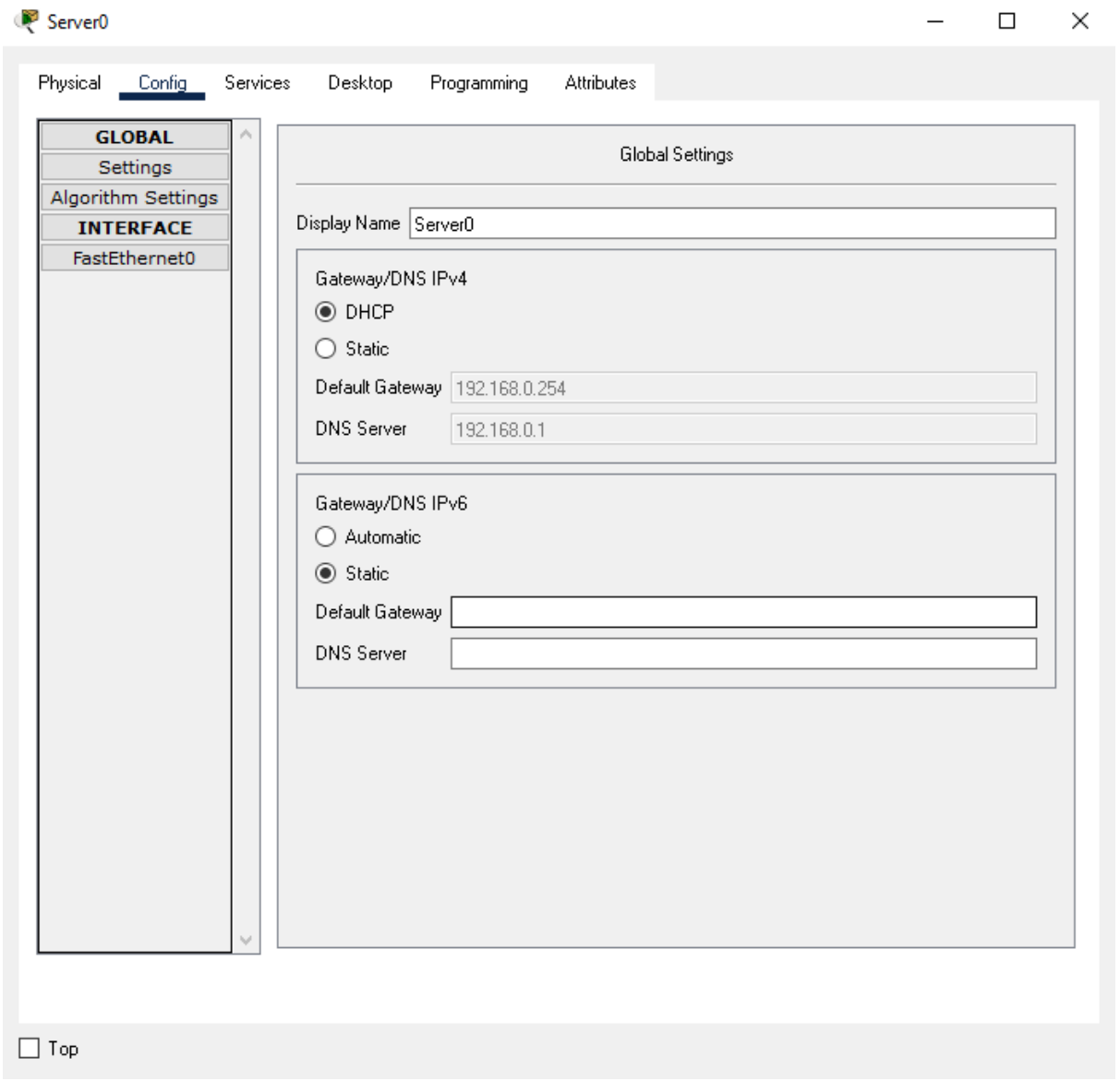

```
Router(dhcp-config)#network 192.168.0.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.0.254
Router(dhcp-config)#dns-server 192.168.0.1
Router(dhcp-config)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#write memory
Building configuration...
[OK]
Router#
```

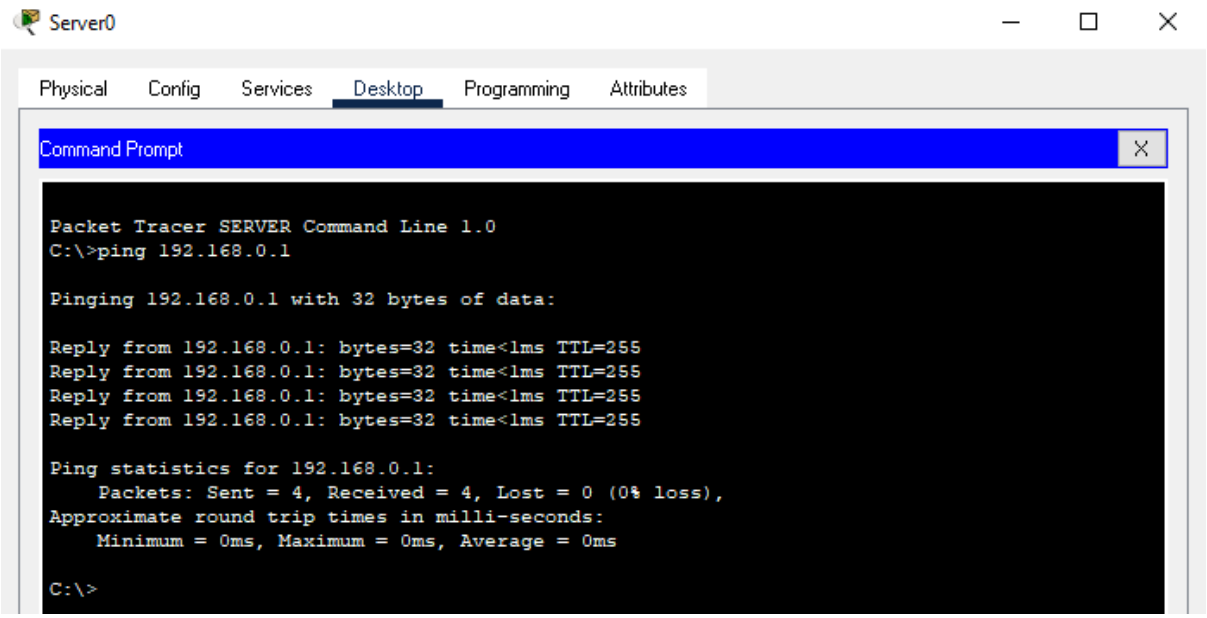



PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.1
Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Reply from 192.168.0.1: bytes=32 time=1ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>

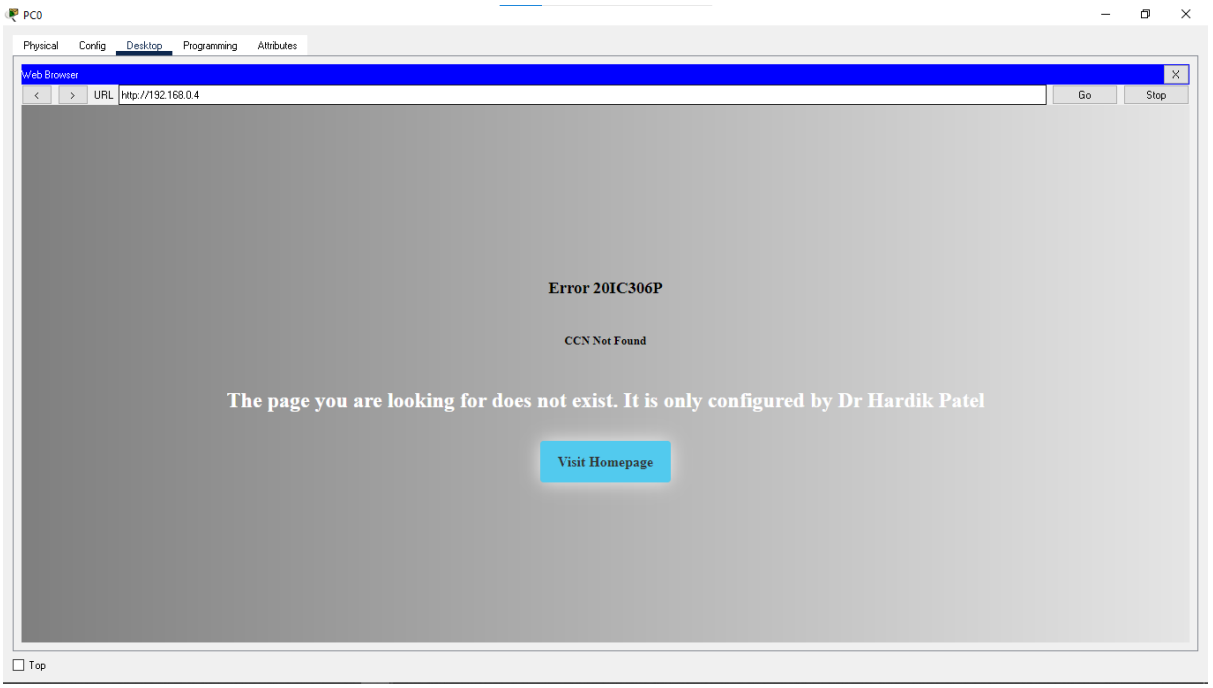

Laptop0
Physical
Config
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Bluetooth
Global Settings
Display Name
Laptop0
Interfaces
FastEthernet0
Gateway/DNS IPv4
DHCP
Static
Default Gateway
192.168.0.254
DNS Server
192.168.0.1
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
Top


Laptop0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.1
Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Reply from 192.168.0.1: bytes=32 time=1ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Reply from 192.168.0.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>


Server0
Physical
Config
Services
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Global Settings
Display Name
Server0
Gateway/DNS IPv4
DHCP
Static
Default Gateway
192.168.0.254
DNS Server
192.168.0.1
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
Top




```
Router>
Router>ping 192.168.0.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router>ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router>ping 192.168.0.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.4, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router>
```


PC0
Physical
Config
Desktop
Programming
Attributes
Web Browser
URL
http://192.168.0.4
Go
Stop
Error 20IC306P
CCN Not Found
The page you are looking for does not exist. It is only configured by Dr Hardik Patel
Visit Homepage
Top