

Module-1

DOS Commands

1.PING Command

How to check internet connection in CMD

To check whether your internet connection works, you can use Command Prompt to test your connection to a certain website or internet location. To do that, you can use the ping network command, followed by a web address or IP address. For instance, you can check the connectivity to GOOGLE without opening a web browser, by typing the command " ping www.google.com." Then press Enter on your keyboard.

Ping is used to check the connectivity with other devices on the network, for example computers, routers, switches etc. Select Start > Programs > Accessories > Command Prompt. This will give you a window like the one below.

Type `C:\>ping x.x.x.x`

By default, ping sends four ICMP Echo Request packets each of 32 bytes. The response packets are called ICMP Echo Reply Packets.

A screenshot of a Windows Command Prompt window. The title bar reads "C:\WINDOWS\system32\cmd.exe". The window content shows the following text:

```
Microsoft Windows [Version 5.2.3790]
(C) Copyright 1985-2003 Microsoft Corp.

C:\Documents and Settings\Administrator>ping 155.0.0.24

Pinging 155.0.0.24 with 32 bytes of data:

Reply from 155.0.0.24: bytes=32 time<1ms TTL=128
Reply from 155.0.0.24: bytes=32 time<1ms TTL=128
Reply from 155.0.0.24: bytes=32 time<1ms TTL=128
Reply from 155.0.0.24: bytes=32 time<1ms TTL=128

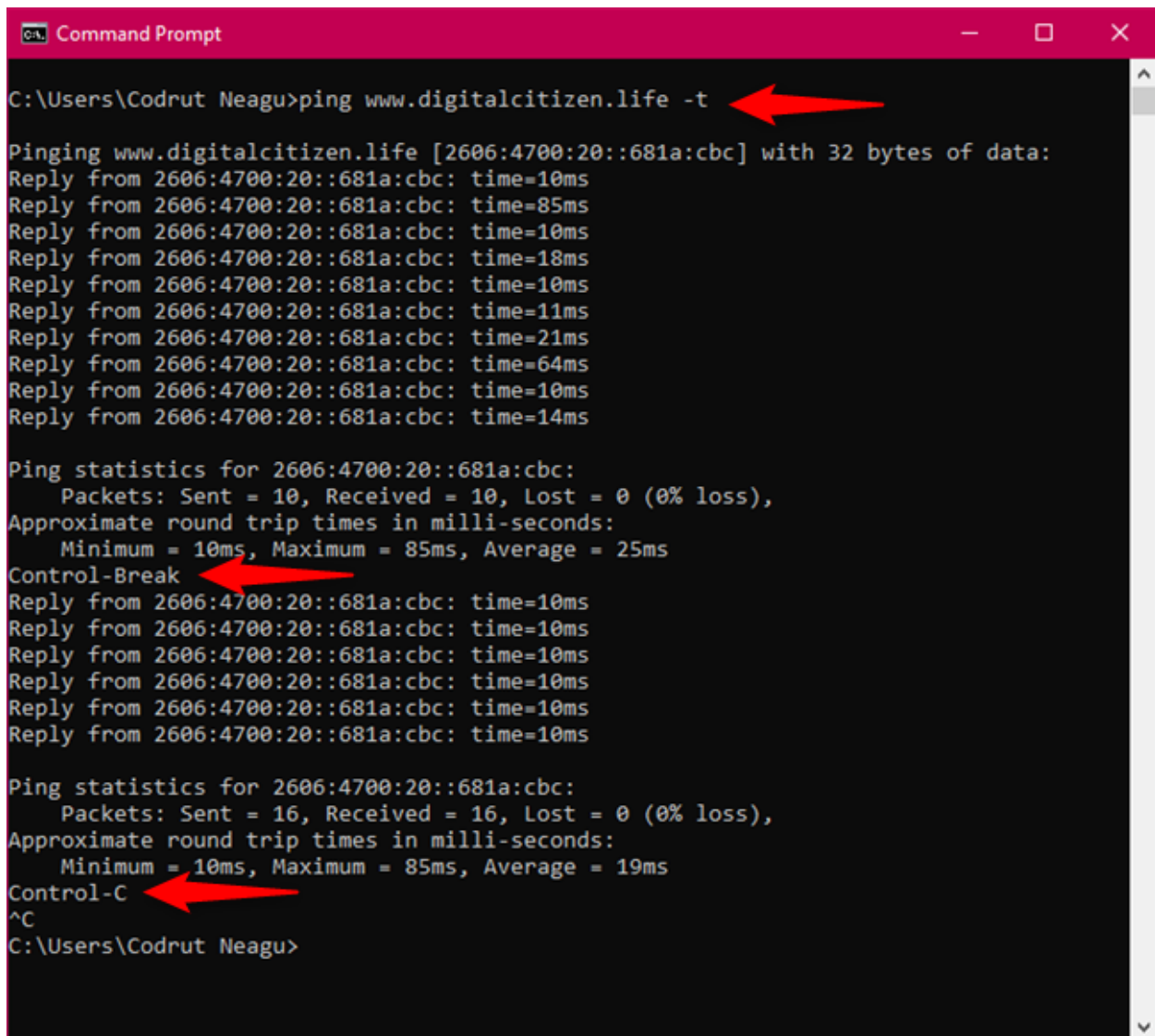
Ping statistics for 155.0.0.24:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Fig : The Ping Command

Now Type `C:\>ping x.x.x.x -t`

- The ping command also allows you to use the handy "-t" parameter, which enables you to ping the specified address forever until it's manually stopped. For instance, we typed "ping -t www.digitalcitizen.life." After some time, we wanted to see some connection statistics and we used the keyboard combination "CTRL + Break." This shows the averages of the ping commands run until then.

- “-t” switch will continue to send packets to the destination until user stops this by pressing *Ctrl + C*



```
C:\Users\Codrut Neagu>ping www.digitalcitizen.life -t

Pinging www.digitalcitizen.life [2606:4700:20::681a:cbc] with 32 bytes of data:
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=85ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=18ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=11ms
Reply from 2606:4700:20::681a:cbc: time=21ms
Reply from 2606:4700:20::681a:cbc: time=64ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=14ms

Ping statistics for 2606:4700:20::681a:cbc:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 85ms, Average = 25ms
Control-Break
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=10ms
Reply from 2606:4700:20::681a:cbc: time=10ms

Ping statistics for 2606:4700:20::681a:cbc:
    Packets: Sent = 16, Received = 16, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 85ms, Average = 19ms
Control-C
^C
C:\Users\Codrut Neagu>
```

2. IPCONFIG Command

How can I see all the network adapters on my computer using CMD?

To obtain detailed information about your network adapters and connections, use the `ipconfig` command. Open Command Prompt, type `ipconfig`, and press Enter. As you can see in the screenshot below, when you run this command, Windows displays the list of all the active network devices, whether they're connected or disconnected, and their IP addresses. You also get details such as their default gateway IP addresses, subnet masks and the state of each network adapter.

```
Command Prompt
C:\Users\Codrut Neagu>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2a02:2f01:730a:1300:107c:de5c:5f89:c00a
    Temporary IPv6 Address. . . . . : 2a02:2f01:730a:1300:254b:7d03:4a72:9b5c
    Link-local IPv6 Address . . . . . : fe80::107c:de5c:5f89:c00a%20
    IPv4 Address. . . . . : 192.168.50.239
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::6d9:f5ff:feb5:b1f0%20
                                192.168.50.1

Wireless LAN adapter Wi-Fi:

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

Wireless LAN adapter Local Area Connection* 9:

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

C:\Users\Codrut Neagu>
```

Displays full TCP/IP configuration of all network adapters (Ethernet cards) installed in your system. Type the following command in the command prompt.

C:\ipconfig

```
C:\WINDOWS\System32\cmd.exe
C:\>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection 3:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.5.28
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.5.100
```

Figure 2: The IPCONFIG Command

Now type *C:\ipconfig /all*

If you add the /all switch to the ipconfig command, you can get to a whole new level of detail: DNS information, the MAC (Media Access Control) (in the Physical Address field), and other information about each network component. Check out the picture below to see a sample of what you get from the "ipconfig /all" command.

```
Command Prompt
C:\Users\Codrut Neagu>ipconfig /all

Windows IP Configuration

Host Name . . . . . : Codrut-PC
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . :
Description . . . . . : Realtek PCIe 2.5GbE Family Controller
Physical Address. . . . . : 04-D9-F5-34-B1-A3
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IPv6 Address. . . . . : 2a02:2f01:730a:1300:107c:de5c:5f89:c00a(Preferred)
Temporary IPv6 Address. . . . . : 2a02:2f01:730a:1300:254b:7d03:4a72:9b5c(Preferred)
Link-local IPv6 Address . . . . . : fe80::107c:de5c:5f89:c00a%20(Preferred)
IPv4 Address. . . . . : 192.168.50.239(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Thursday, January 23, 2020 1:45:35 PM
Lease Expires . . . . . : Friday, January 24, 2020 1:45:34 PM
Default Gateway . . . . . : fe80::6d9:f5ff:feb5:b1f0%20
                          192.168.50.1
DHCP Server . . . . . : 192.168.50.1
DHCPv6 IAID . . . . . : 335862261
DHCPv6 Client DUID. . . . . : 00-01-00-01-25-21-90-1C-04-D9-F5-34-B1-A3
DNS Servers . . . . . : 2a02:2f01:730a:1300::1
                          192.168.50.1
                          2a02:2f01:730a:1300::1
NetBIOS over Tcpip. . . . . : Enabled

Wireless LAN adapter Wi-Fi:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Wi-Fi 6 AX200 160MHz
Physical Address. . . . . : 38-00-25-41-C3-F5
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

Ip config has a number of switches the most common are:

ipconfig /all – displays more information about the network setup on your systems including the MAC address.

ipconfig /release – release the current IP address

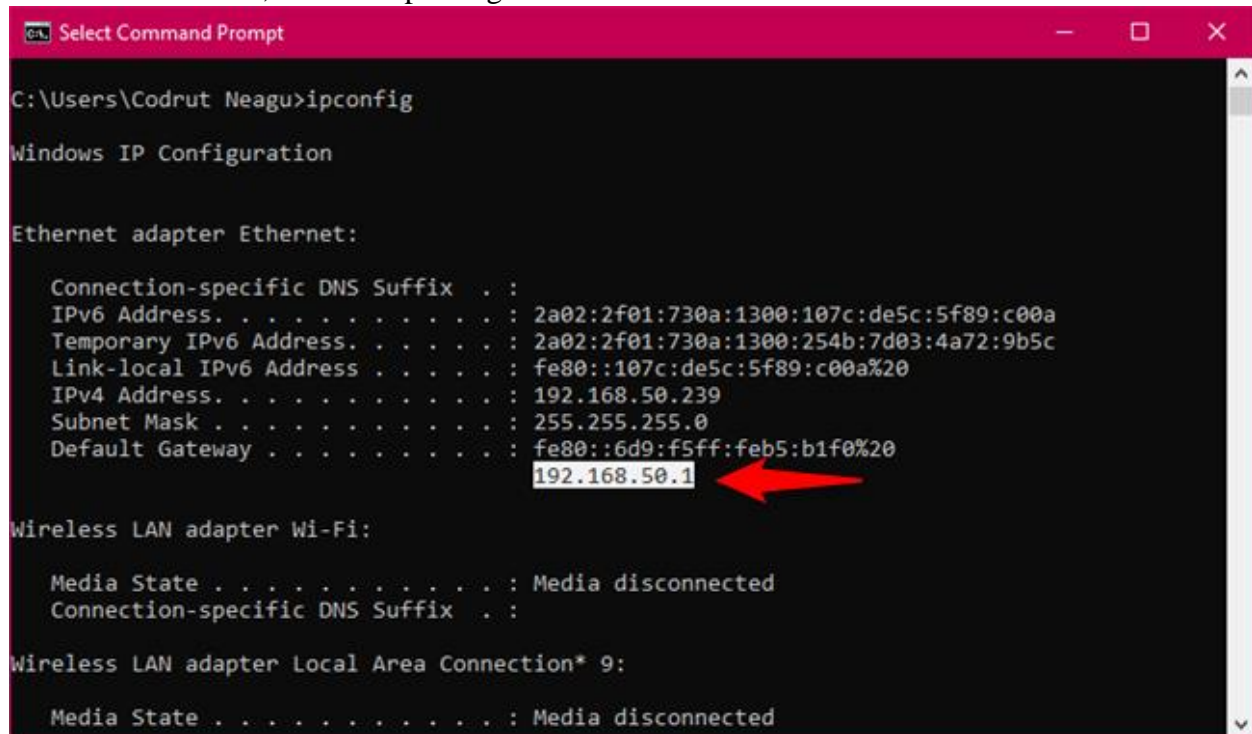
ipconfig /renew – renew IP address

ipconfig /? -shows help

ipconfig/flushdns – flush the dns cache

How to check your network connection in CMD

If you want to check whether your network connection to the router is operating as it should, you can use a combination of the commands `ipconfig` and `ping`. First, get some cmd nic info about your adapter. In other words, open Command Prompt and run `ipconfig`. In the list of results, identify the network adapter that's used for connecting to the network you want to test. Then, in its details, find the IP address of your router and note it down. For example, if we'd want to check our Ethernet network connection, we'd run `ipconfig` and see that our router's IP address is 192.168.50.1.



```

C:\Users\Codrut Neagu>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2a02:2f01:730a:1300:107c:de5c:5f89:c00a
    Temporary IPv6 Address. . . . . : 2a02:2f01:730a:1300:254b:7d03:4a72:9b5c
    Link-local IPv6 Address . . . . . : fe80::107c:de5c:5f89:c00a%20
    IPv4 Address. . . . . : 192.168.50.239
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::6d9:f5ff:feb5:b1f0%20
                               192.168.50.1

Wireless LAN adapter Wi-Fi:

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

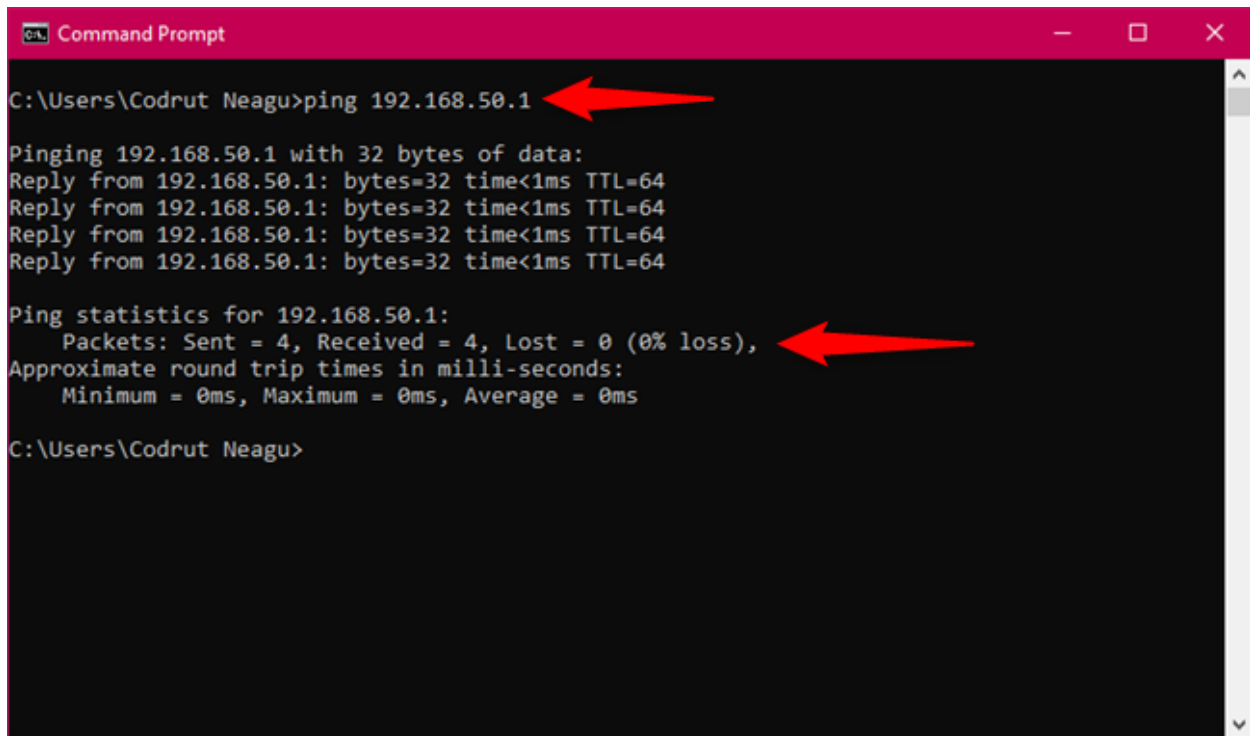
Wireless LAN adapter Local Area Connection* 9:

    Media State . . . . . : Media disconnected

```

Figure :Running `ipconfig` to identify the IP address of the router

The next step is to check that the network connection between the router and the computer is OK. To do that, it's enough to run the `ping` command on the router's IP address. In our example, that would mean that we have to run this command in CMD: `ping 192.168.50.1`.



```
C:\Users\Codrut Neagu>ping 192.168.50.1

Pinging 192.168.50.1 with 32 bytes of data:
Reply from 192.168.50.1: bytes=32 time<1ms TTL=64
Reply from 192.168.50.1: bytes=32 time<1ms TTL=64
Reply from 192.168.50.1: bytes=32 time<1ms TTL=64
Reply from 192.168.50.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.50.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Codrut Neagu>
```

Figure: Pinging the router to check the network connection

If there are no packets lost, then the network connection tested is running well. Otherwise, there's a problem somewhere between your computer and the router, in which case you should check that your PC's network adapter is configured correctly, that the Ethernet cable is OK (if you're using a wired connection), and that the router is configured properly.

How to renew the IP address of your network adapter

When your network connection doesn't work as it should, your network adapter might not have the right IP address assigned. A quick way of trying to solve this issue is to renew its IP address and, fortunately, you can do that quickly, straight from the Command Prompt. Open CMD and run the following commands: `ipconfig /release` and `ipconfig /renew`. The first one (`ipconfig /release`) forces your network adapter to drop its assigned IP address, and the second command (`ipconfig /renew`) renews the network adapter's IP address.

```
Command Prompt
C:\Users\Codrut Neagu>ipconfig /release 1
Windows IP Configuration

No operation can be performed on Wi-Fi while it has its media disconnected.
No operation can be performed on Local Area Connection* 9 while it has its media disconnected.
No operation can be performed on Local Area Connection* 10 while it has its media disconnected.

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    IPv6 Address. . . . . : 2a02:2f01:730a:1300:107c:de5c:5f89:c00a
    Temporary IPv6 Address. . . . . : 2a02:2f01:730a:1300:254b:7d03:4a72:9b5c
    Link-local IPv6 Address . . . . . : fe80::107c:de5c:5f89:c00a%20
    Default Gateway . . . . . : fe80::6d9:f5ff:feb5:b1f0%20

Wireless LAN adapter Wi-Fi:

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

Wireless LAN adapter Local Area Connection* 9:

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

Wireless LAN adapter Local Area Connection* 10:

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

C:\Users\Codrut Neagu>ipconfig /renew 2
Windows IP Configuration
```

Figure: Running ipconfig /release and ipconfig /renew to reset the IP address

3 TRACERT Command

Tracert command tells you the path a packet takes from your computer to the destination. It will list all the routers from which a packet passes until it reaches its destination.

C:\tracert google.com

```
C:\WINDOWS\system32\cmd.exe
C:\Documents and Settings\Administrator>tracert google.com
Tracing route to google.com [72.14.207.99]
over a maximum of 30 hops:
  0  <1 ms    <1 ms    <1 ms    150.0.0.1
  1  <1 ms    <1 ms    <1 ms    ntc.net.pk [202.83.163.105]
  2  28 ms    29 ms    29 ms    ntc.net.pk [202.83.160.129]
  3  24 ms    26 ms    26 ms    gwishb.ntc.net.pk [202.83.160.61]
  4  72 ms    231 ms   268 ms    s8-1-0.rop44d1.pie.net.pk [202.125.155.65]
  5  49 ms    52 ms    49 ms    rvp44.pie.net.pk [202.125.148.133]
  6  80 ms    52 ms    52 ms    pos2-2.khi77gsrc1.pie.net.pk [202.125.159.45]
  7  51 ms    46 ms    49 ms    g3-0.khi77gwi1.pie.net.pk [202.125.128.162]
  8  181 ms   181 ms   182 ms    t2a4-p2-3.uk-lon2.eu.bt.net [166.49.209.51]
  9  180 ms   181 ms   185 ms    t2c2-ge7-0.uk-lon2.eu.bt.net [166.49.176.44]
 10  181 ms   181 ms   182 ms    t2c1-ge4-2.uk-lon1.eu.bt.net [166.49.208.61]
 11  185 ms   185 ms   185 ms    t2a1-pc1.uk-lon1.eu.bt.net [166.49.135.98]
 12  183 ms   185 ms   221 ms    195.66.226.125
 13  179 ms   181 ms   185 ms    72.14.238.242
 14  271 ms   267 ms   268 ms    72.14.236.216
 15  281 ms   268 ms   268 ms    72.14.236.213
 16  326 ms   274 ms   271 ms    72.14.233.115
 17  272 ms   281 ms   304 ms    66.249.94.96
 18  272 ms   272 ms   274 ms    66.249.94.118
 19  275 ms   274 ms   274 ms    72.14.207.99
Trace complete.
C:\Documents and Settings\Administrator>
```

4. NSLOOKUP Command

Displays the default DNS server information.

Type the following command

```
C:\>nslookup
```

What is your default DNS server's IP address?

5 . NETSTAT Command

You can get other useful cmd nic info from the netstat command, which lets you see the network connections that are active between your system and any other systems on your network or the internet.

Displays active TCP and UDP connections.

Practice the following commands

```
C:\>netstat
```

```
C:\>netstat -a
```

```
C:\>netstat -an
```



```
GA Command Prompt - netstat
Microsoft Windows [Version 10.0.18363.592]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Codrut Neagu>netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP    127.0.0.1:9012           Codrut-PC:49999        ESTABLISHED
TCP    127.0.0.1:9013           Codrut-PC:50162        ESTABLISHED
TCP    127.0.0.1:9487           Codrut-PC:49815        ESTABLISHED
TCP    127.0.0.1:49815         Codrut-PC:9487         ESTABLISHED
TCP    127.0.0.1:49856         Codrut-PC:49857        ESTABLISHED
TCP    127.0.0.1:49857         Codrut-PC:49856        ESTABLISHED
TCP    127.0.0.1:49860         Codrut-PC:49861        ESTABLISHED
TCP    127.0.0.1:49861         Codrut-PC:49860        ESTABLISHED
TCP    127.0.0.1:49870         Codrut-PC:49871        ESTABLISHED
TCP    127.0.0.1:49871         Codrut-PC:49870        ESTABLISHED
TCP    127.0.0.1:49872         Codrut-PC:49873        ESTABLISHED
TCP    127.0.0.1:49873         Codrut-PC:49872        ESTABLISHED
TCP    127.0.0.1:49876         Codrut-PC:49877        ESTABLISHED
TCP    127.0.0.1:49877         Codrut-PC:49876        ESTABLISHED
TCP    127.0.0.1:49999         Codrut-PC:9012         ESTABLISHED
TCP    127.0.0.1:50014         Codrut-PC:65001        ESTABLISHED
TCP    127.0.0.1:50030         Codrut-PC:50101        ESTABLISHED
TCP    127.0.0.1:50101         Codrut-PC:50030        ESTABLISHED
TCP    127.0.0.1:50162         Codrut-PC:9013         ESTABLISHED
TCP    127.0.0.1:56854         Codrut-PC:56855        ESTABLISHED
TCP    127.0.0.1:56855         Codrut-PC:56854        ESTABLISHED
TCP    127.0.0.1:56859         Codrut-PC:56860        ESTABLISHED
TCP    127.0.0.1:56860         Codrut-PC:56859        ESTABLISHED
TCP    127.0.0.1:57015         Codrut-PC:57016        ESTABLISHED
TCP    127.0.0.1:57016         Codrut-PC:57015        ESTABLISHED
TCP    127.0.0.1:57607         Codrut-PC:57608        ESTABLISHED
TCP    127.0.0.1:57608         Codrut-PC:57607        ESTABLISHED
TCP    127.0.0.1:57692         Codrut-PC:57693        ESTABLISHED
TCP    127.0.0.1:57693         Codrut-PC:57692        ESTABLISHED
TCP    127.0.0.1:65001         Codrut-PC:50014        ESTABLISHED
TCP    192.168.50.239:58685     51.105.249.228:https   ESTABLISHED
TCP    192.168.50.239:58692     ec2-54-190-34-249:https ESTABLISHED
TCP    192.168.50.239:58696     136:http               ESTABLISHED
TCP    192.168.50.239:58706     51.105.249.228:https   ESTABLISHED
TCP    192.168.50.239:58750     ec2-3-120-198-117:https ESTABLISHED
TCP    192.168.50.239:59957     53:https               ESTABLISHED
TCP    192.168.50.239:60094     do-1:https             ESTABLISHED
```

Netstat shows the active network connections and open ports

If you add the -a parameter to the netstat command, you can get a list with all the connections and listening ports, as seen in the image below.

```
Command Prompt - netstat -a

C:\Users\Codrut Neagu>netstat -a

Active Connections

Proto Local Address Foreign Address State
TCP 0.0.0.0:135 Codrut-PC:0 LISTENING
TCP 0.0.0.0:445 Codrut-PC:0 LISTENING
TCP 0.0.0.0:902 Codrut-PC:0 LISTENING
TCP 0.0.0.0:912 Codrut-PC:0 LISTENING
TCP 0.0.0.0:5040 Codrut-PC:0 LISTENING
TCP 0.0.0.0:5357 Codrut-PC:0 LISTENING
TCP 0.0.0.0:7680 Codrut-PC:0 LISTENING
TCP 0.0.0.0:9012 Codrut-PC:0 LISTENING
TCP 0.0.0.0:9013 Codrut-PC:0 LISTENING
TCP 0.0.0.0:49664 Codrut-PC:0 LISTENING
TCP 0.0.0.0:49665 Codrut-PC:0 LISTENING
TCP 0.0.0.0:49666 Codrut-PC:0 LISTENING
TCP 0.0.0.0:49667 Codrut-PC:0 LISTENING
TCP 0.0.0.0:49670 Codrut-PC:0 LISTENING
TCP 0.0.0.0:49844 Codrut-PC:0 LISTENING
TCP 0.0.0.0:57621 Codrut-PC:0 LISTENING
TCP 0.0.0.0:61688 Codrut-PC:0 LISTENING
TCP 127.0.0.1:1042 Codrut-PC:0 LISTENING
TCP 127.0.0.1:1043 Codrut-PC:0 LISTENING
TCP 127.0.0.1:3213 Codrut-PC:0 LISTENING
TCP 127.0.0.1:9012 Codrut-PC:49999 ESTABLISHED
TCP 127.0.0.1:9013 Codrut-PC:50162 ESTABLISHED
TCP 127.0.0.1:9487 Codrut-PC:0 LISTENING
TCP 127.0.0.1:9487 Codrut-PC:49815 ESTABLISHED
TCP 127.0.0.1:13010 Codrut-PC:0 LISTENING
TCP 127.0.0.1:13030 Codrut-PC:0 LISTENING
TCP 127.0.0.1:17945 Codrut-PC:0 LISTENING
TCP 127.0.0.1:49815 Codrut-PC:9487 ESTABLISHED
TCP 127.0.0.1:49856 Codrut-PC:49857 ESTABLISHED
TCP 127.0.0.1:49857 Codrut-PC:49856 ESTABLISHED
TCP 127.0.0.1:49860 Codrut-PC:49861 ESTABLISHED
TCP 127.0.0.1:49861 Codrut-PC:49860 ESTABLISHED
TCP 127.0.0.1:49870 Codrut-PC:49871 ESTABLISHED
TCP 127.0.0.1:49871 Codrut-PC:49870 ESTABLISHED
TCP 127.0.0.1:49872 Codrut-PC:49873 ESTABLISHED
TCP 127.0.0.1:49873 Codrut-PC:49872 ESTABLISHED
TCP 127.0.0.1:49876 Codrut-PC:49877 ESTABLISHED
TCP 127.0.0.1:49877 Codrut-PC:49876 ESTABLISHED
TCP 127.0.0.1:49999 Codrut-PC:9012 ESTABLISHED
TCP 127.0.0.1:50014 Codrut-PC:65001 ESTABLISHED
TCP 127.0.0.1:50030 Codrut-PC:0 LISTENING
TCP 127.0.0.1:50030 Codrut-PC:50101 ESTABLISHED
TCP 127.0.0.1:50101 Codrut-PC:50030 ESTABLISHED
TCP 127.0.0.1:50162 Codrut-PC:9013 ESTABLISHED
TCP 127.0.0.1:56854 Codrut-PC:56855 ESTABLISHED
TCP 127.0.0.1:56855 Codrut-PC:56854 ESTABLISHED
TCP 127.0.0.1:56859 Codrut-PC:56860 ESTABLISHED
TCP 127.0.0.1:56860 Codrut-PC:56859 ESTABLISHED
TCP 127.0.0.1:57015 Codrut-PC:57016 ESTABLISHED
TCP 127.0.0.1:57016 Codrut-PC:57015 ESTABLISHED
TCP 127.0.0.1:57607 Codrut-PC:57608 ESTABLISHED
TCP 127.0.0.1:57608 Codrut-PC:57607 ESTABLISHED
TCP 127.0.0.1:57692 Codrut-PC:57693 ESTABLISHED
TCP 127.0.0.1:57693 Codrut-PC:57692 ESTABLISHED
TCP 127.0.0.1:65001 Codrut-PC:0 LISTENING
TCP 127.0.0.1:65001 Codrut-PC:50014 ESTABLISHED
TCP 192.168.50.239:139 Codrut-PC:0 LISTENING
TCP 192.168.50.239:58685 51.105.249.228:https ESTABLISHED
```

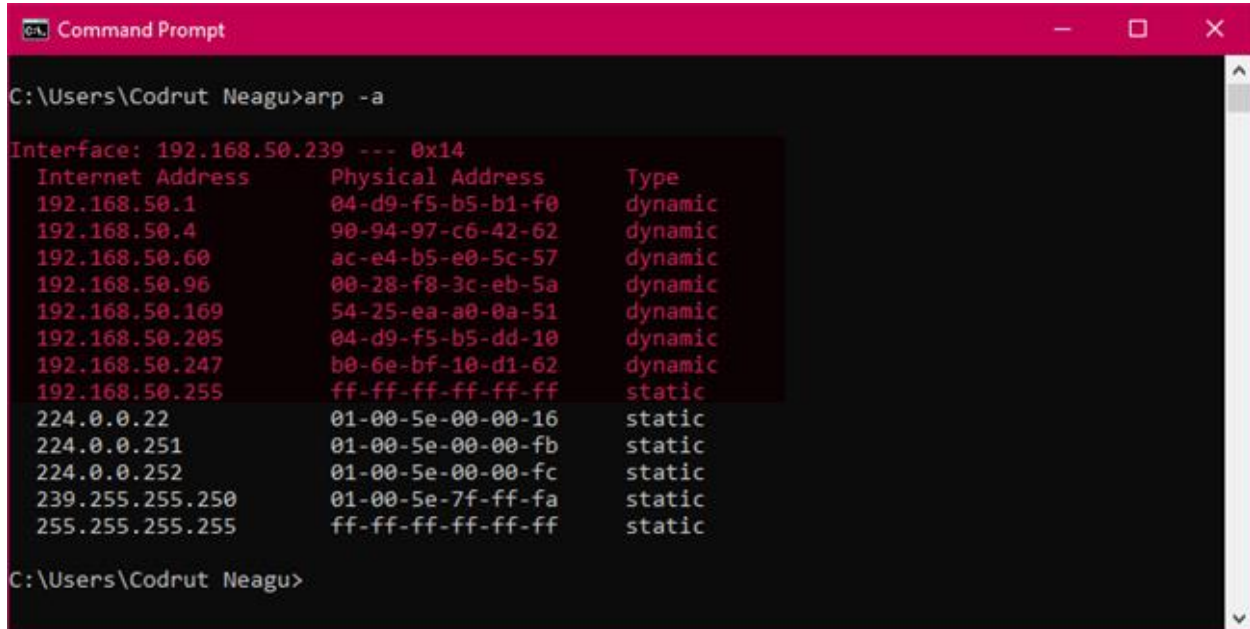
Netstat -a displays the active network connections, open ports and listening ports

6. ARP Command

ARP command corresponds to the Address Resolution Protocol, it is easy to understand of network communications in terms of IP addressing, packet delivery is ultimately dependent on the Media Access Control (MAC) address of the device's network adapter. This is where the Address Resolution Protocol comes into play. Its job is to map IP addresses to MAC addresses.

Windows devices maintain an ARP cache, which contains the results of recent ARP queries. It shows the contents of this cache by using the ARP -A command. If any problems in communicating with one specific host, you can append the remote host's IP address to the ARP -

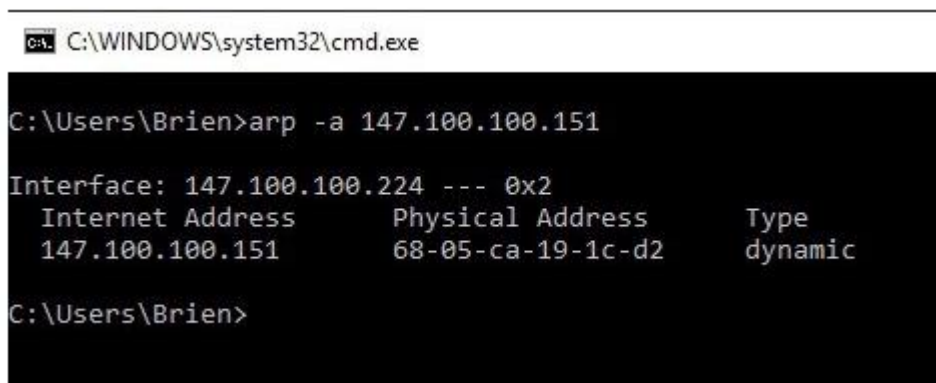
A command.



```
C:\Users\Codrut Neagu>arp -a

Interface: 192.168.50.239 --- 0x14
  Internet Address      Physical Address      Type
  192.168.50.1          04-d9-f5-b5-b1-f0    dynamic
  192.168.50.4          90-94-97-c6-42-62    dynamic
  192.168.50.60         ac-e4-b5-e0-5c-57    dynamic
  192.168.50.96         00-28-f8-3c-eb-5a    dynamic
  192.168.50.169        54-25-ea-a0-0a-51    dynamic
  192.168.50.205        04-d9-f5-b5-dd-10    dynamic
  192.168.50.247        b0-6e-bf-10-d1-62    dynamic
  192.168.50.255        ff-ff-ff-ff-ff-ff    static
  224.0.0.22           01-00-5e-00-00-16    static
  224.0.0.251          01-00-5e-00-00-fb    static
  224.0.0.252          01-00-5e-00-00-fc    static
  239.255.255.250      01-00-5e-7f-ff-fa    static
  255.255.255.255      ff-ff-ff-ff-ff-ff    static

C:\Users\Codrut Neagu>
```



```
C:\WINDOWS\system32\cmd.exe

C:\Users\Brien>arp -a 147.100.100.151

Interface: 147.100.100.224 --- 0x2
  Internet Address      Physical Address      Type
  147.100.100.151      68-05-ca-19-1c-d2    dynamic

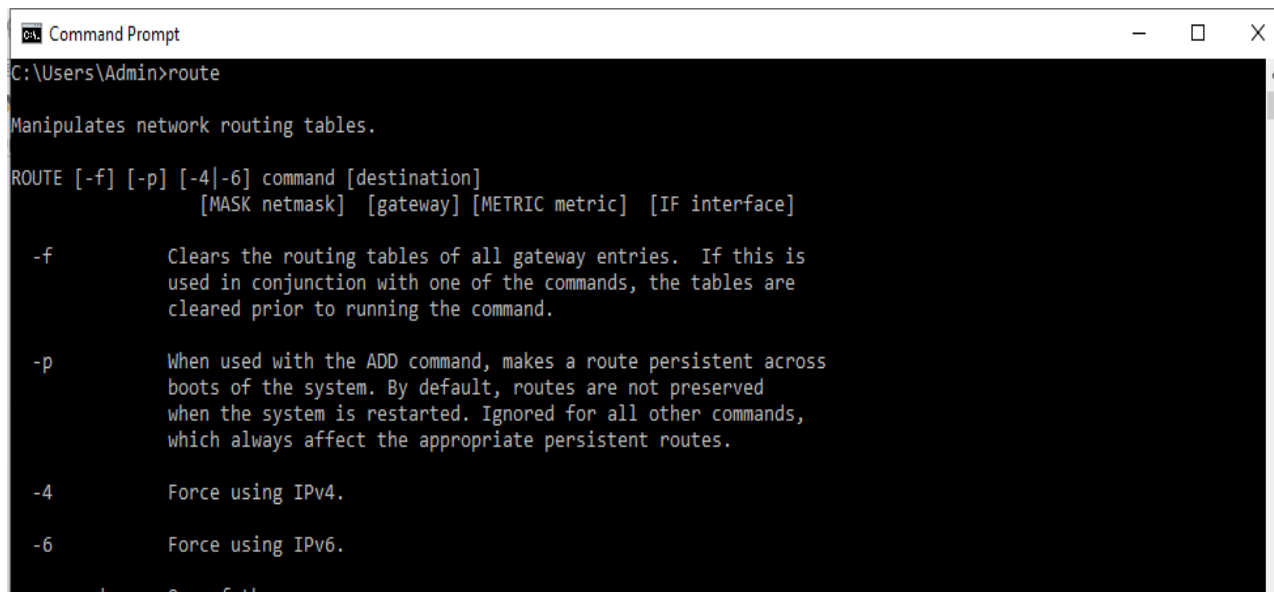
C:\Users\Brien>
```

7.NbtStat-n Command

The NbtStat -n command for example, shows the NetBIOS names that are in use by a device. The NbtStat -r command shows how many NetBIOS names the device has been able to resolve recently.

8.Route Command

IP networks use routing tables to direct packets from one subnet to another. The Windows Route utility allows you to view the device's routing tables. The Route command is that it not only shows you the routing table, it lets you make changes. Commands such as Route Add, Route Delete, and Route Change allow you to make routing table modifications on an as needed basis.



```
Command Prompt
C:\Users\Admin>route

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
        [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f          Clears the routing tables of all gateway entries.  If this is
            used in conjunction with one of the commands, the tables are
            cleared prior to running the command.

-p          When used with the ADD command, makes a route persistent across
            boots of the system. By default, routes are not preserved
            when the system is restarted. Ignored for all other commands,
            which always affect the appropriate persistent routes.

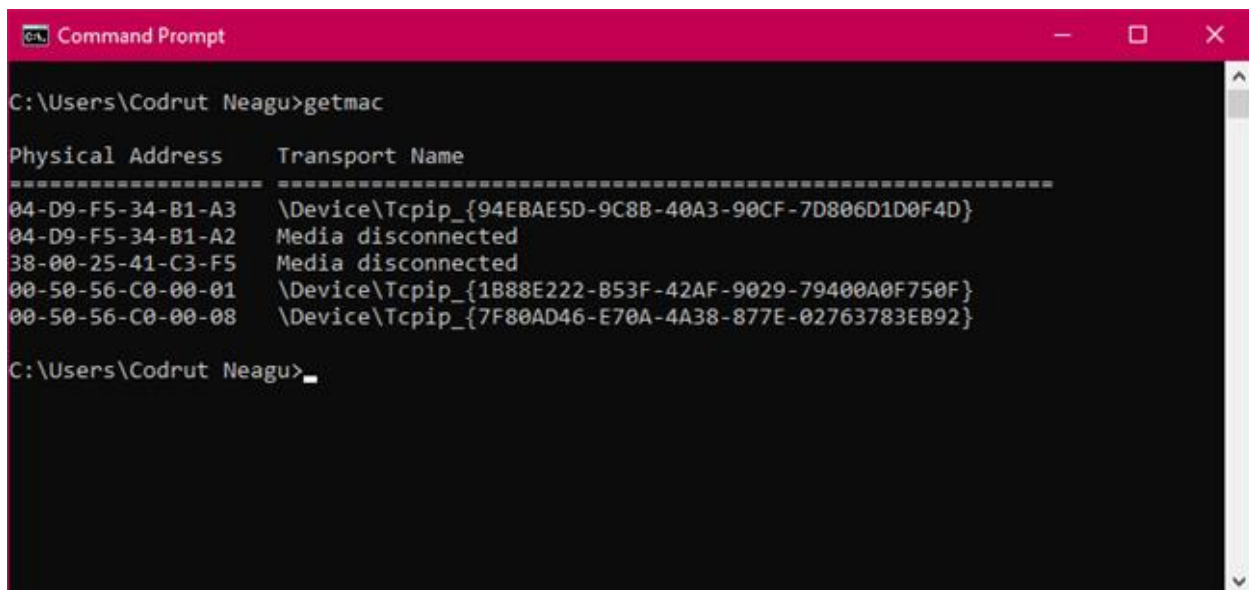
-4          Force using IPv4.

-6          Force using IPv6.

command    One of these:
```

9. GETMAC Command

Getmac is a Windows command used to display the Media Access Control (MAC) addresses for each network adapter in the computer. One of the fastest and easiest ways to obtain the MAC addresses of your network adapters is to use the getmac command. In Command Prompt, type getmac and press Enter, as seen in the image below.



```
Command Prompt
C:\Users\Codrut Neagu>getmac

Physical Address      Transport Name
=====
04-D9-F5-34-B1-A3     \Device\Tcpip_{94EBAE5D-9C8B-40A3-90CF-7D806D1D0F4D}
04-D9-F5-34-B1-A2     Media disconnected
38-00-25-41-C3-F5     Media disconnected
00-50-56-C0-00-01     \Device\Tcpip_{1B88E222-B53F-42AF-9029-79400A0F750F}
00-50-56-C0-00-08     \Device\Tcpip_{7F80AD46-E70A-4A38-877E-02763783EB92}

C:\Users\Codrut Neagu>
```

10.SYSTEMINFO Command: System Information

If you need to know what brand of network card you have, processor details, or the exact version of your Windows OS, the SYSTEMINFO command can help. This command polls your system

and pulls the most important information about your system. It lists the information in a clean format that's easy to read.

Module-2

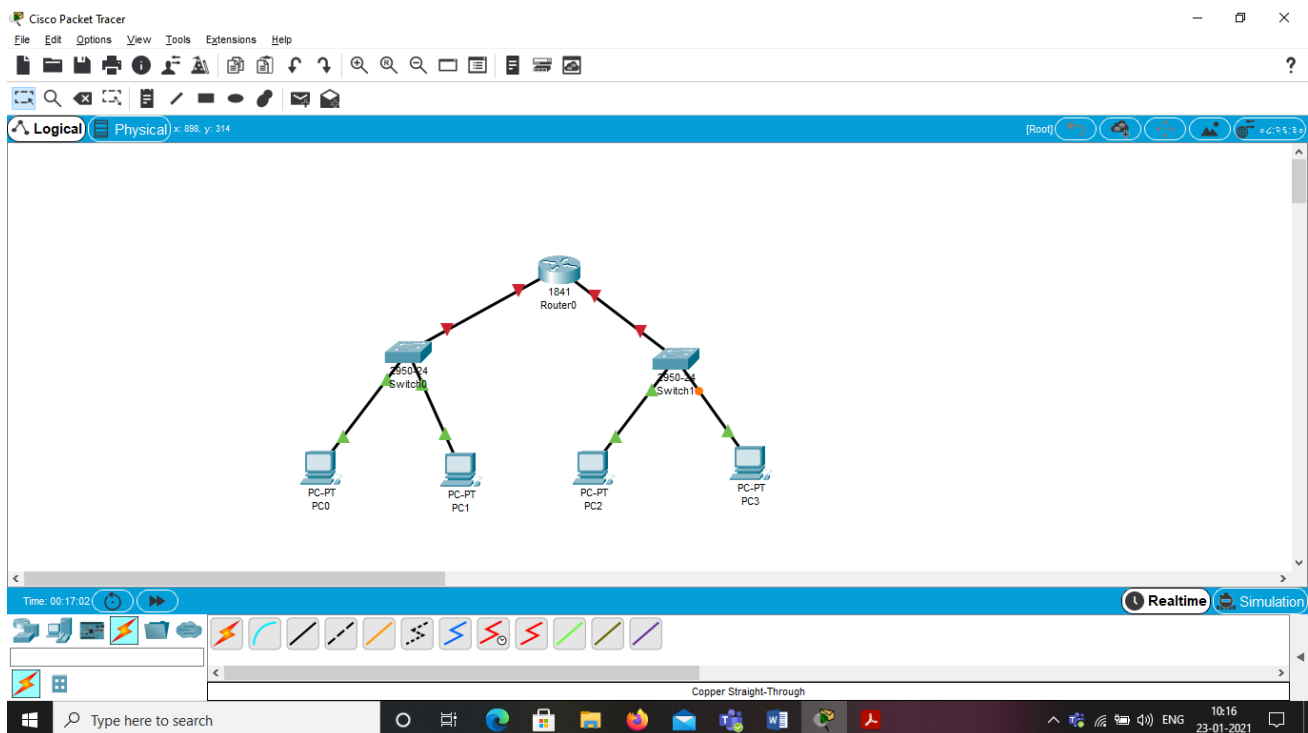
Cisco Packet Tracer tool

Packet Tracer – Creating a New Topology

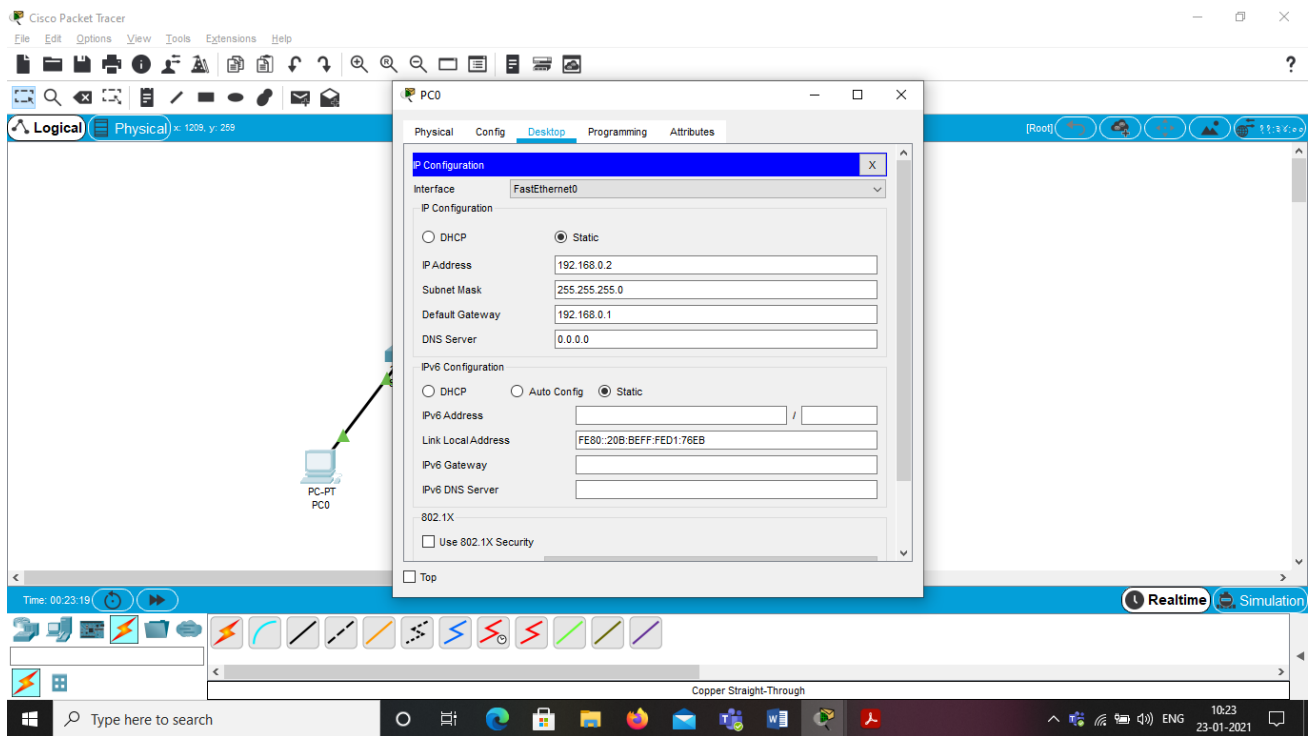
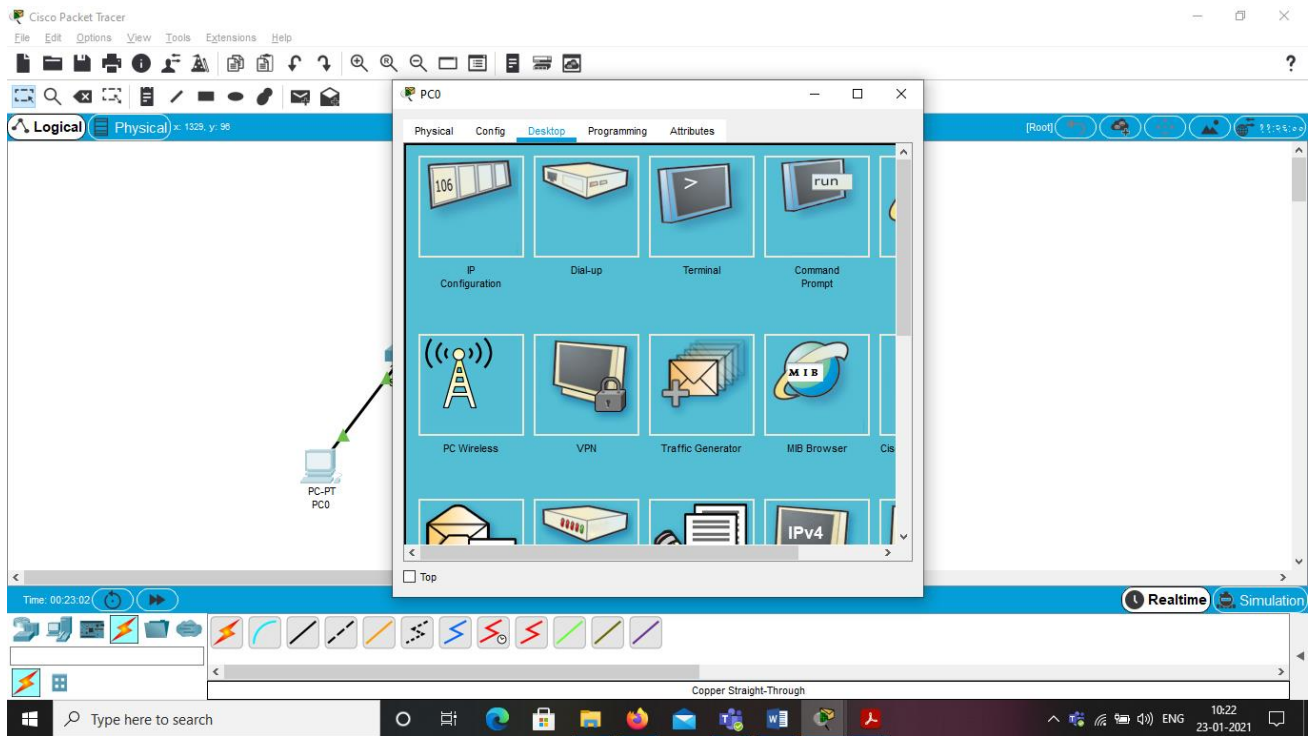
What is Packet Tracer? Packet Tracer is a protocol simulator developed by Dennis Frezzo and his team at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either Real Time or Simulation mode. This includes layer 2 protocols such as Ethernet and PPP, layer 3 protocols such as IP, ICMP, and ARP, and layer 4 protocols such as TCP and UDP. Routing protocols can also be traced.

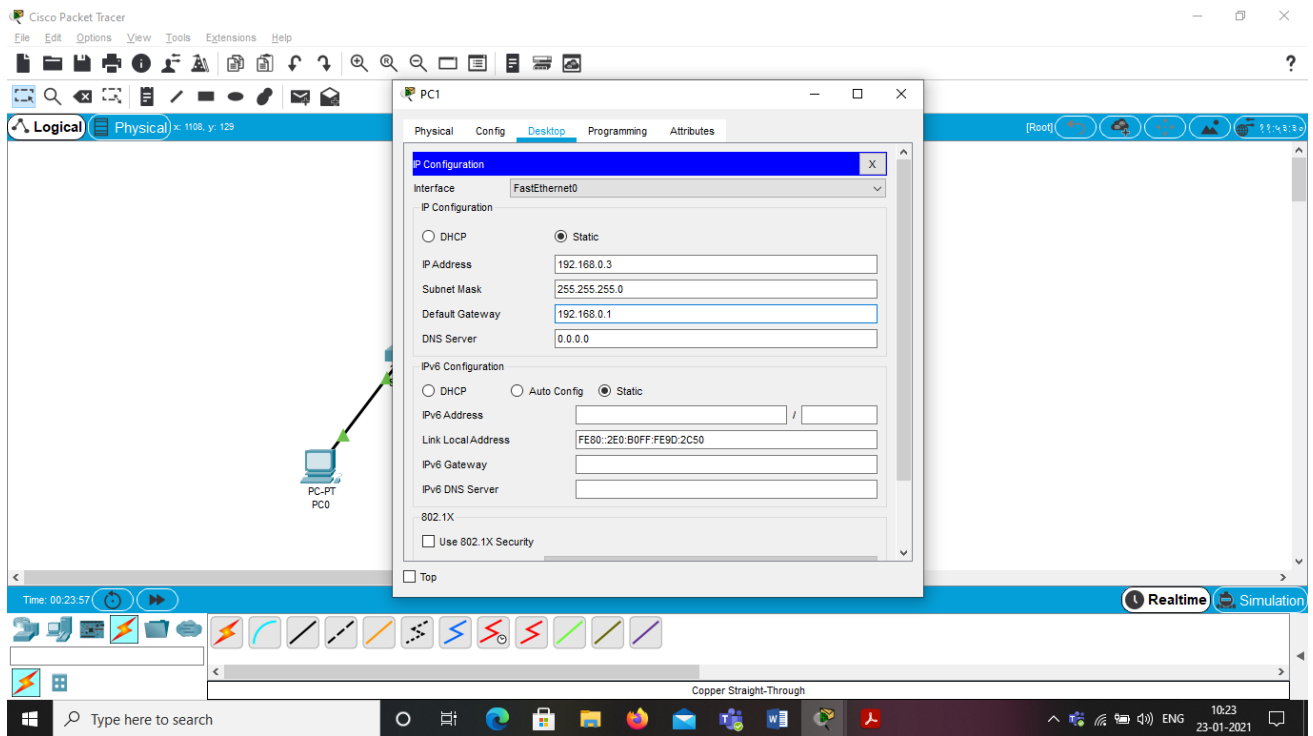
Exp 1: Configuration of Router using cisco packet tracer

Step 1: Construct the topology

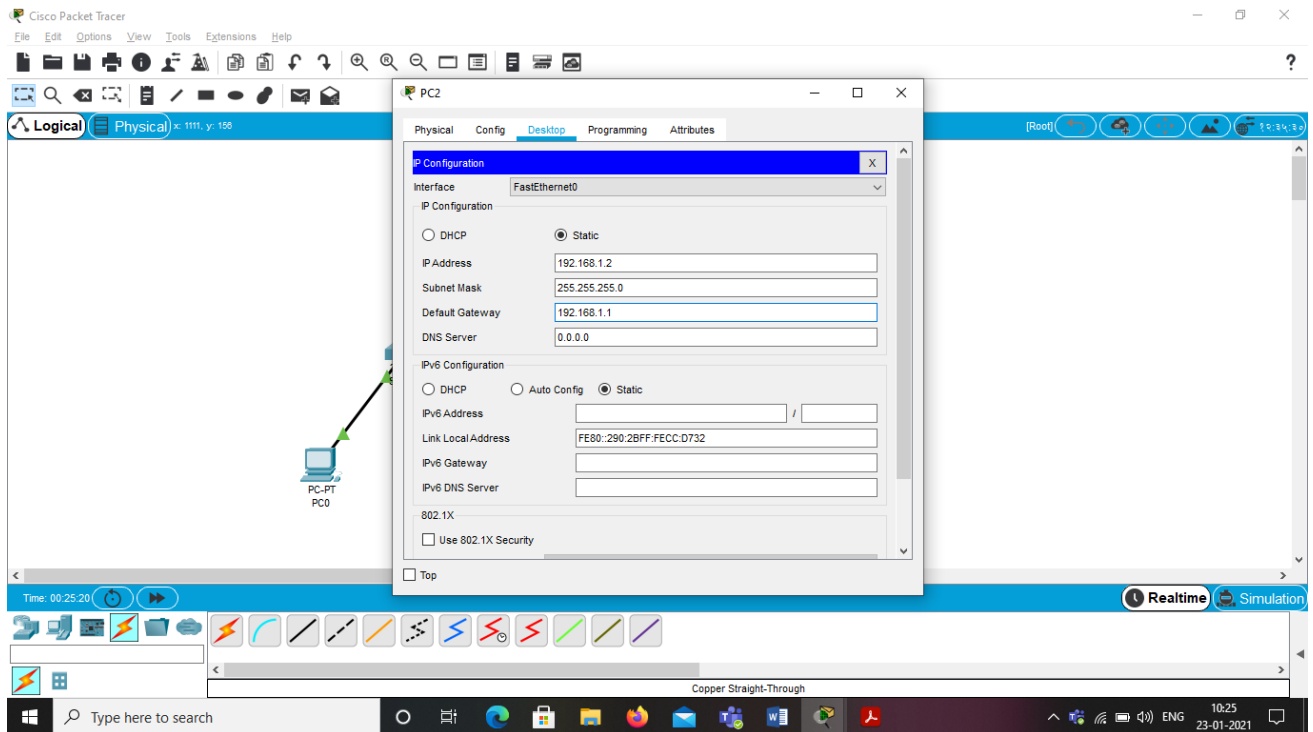


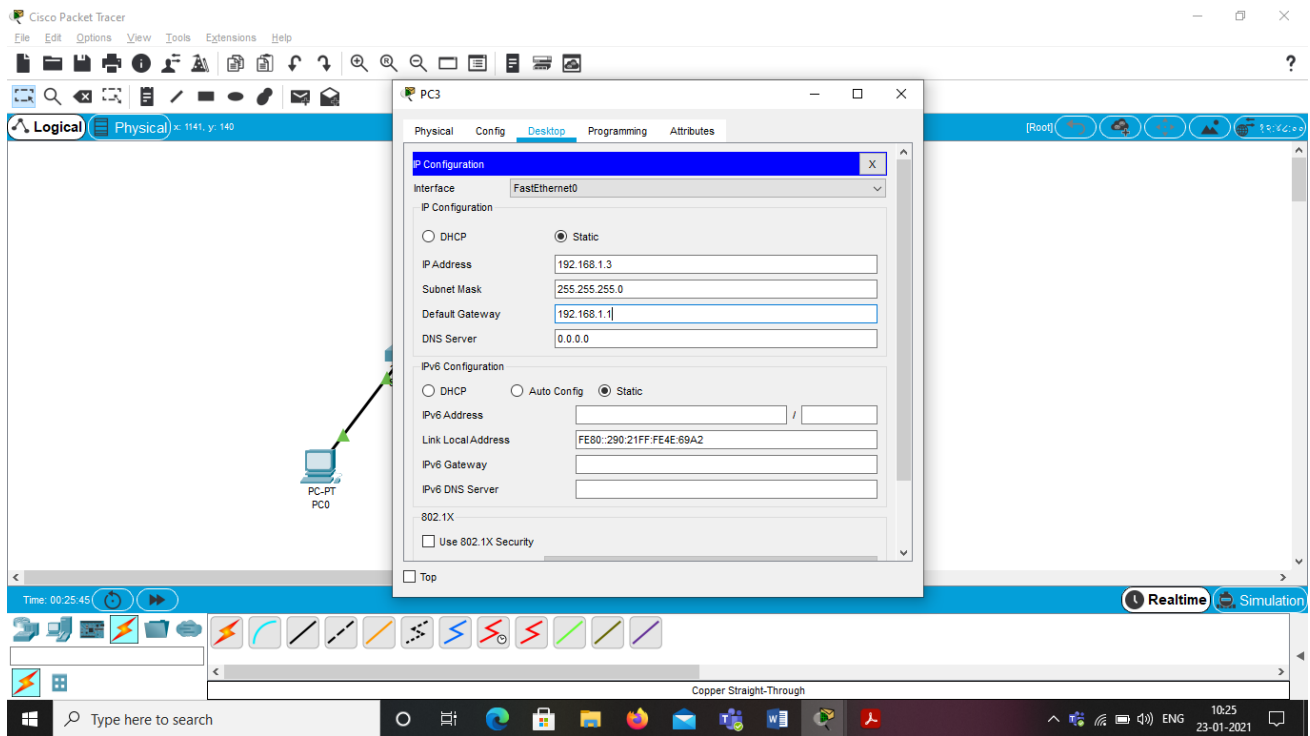
Step 2: Assign IP addresses to all PC's.





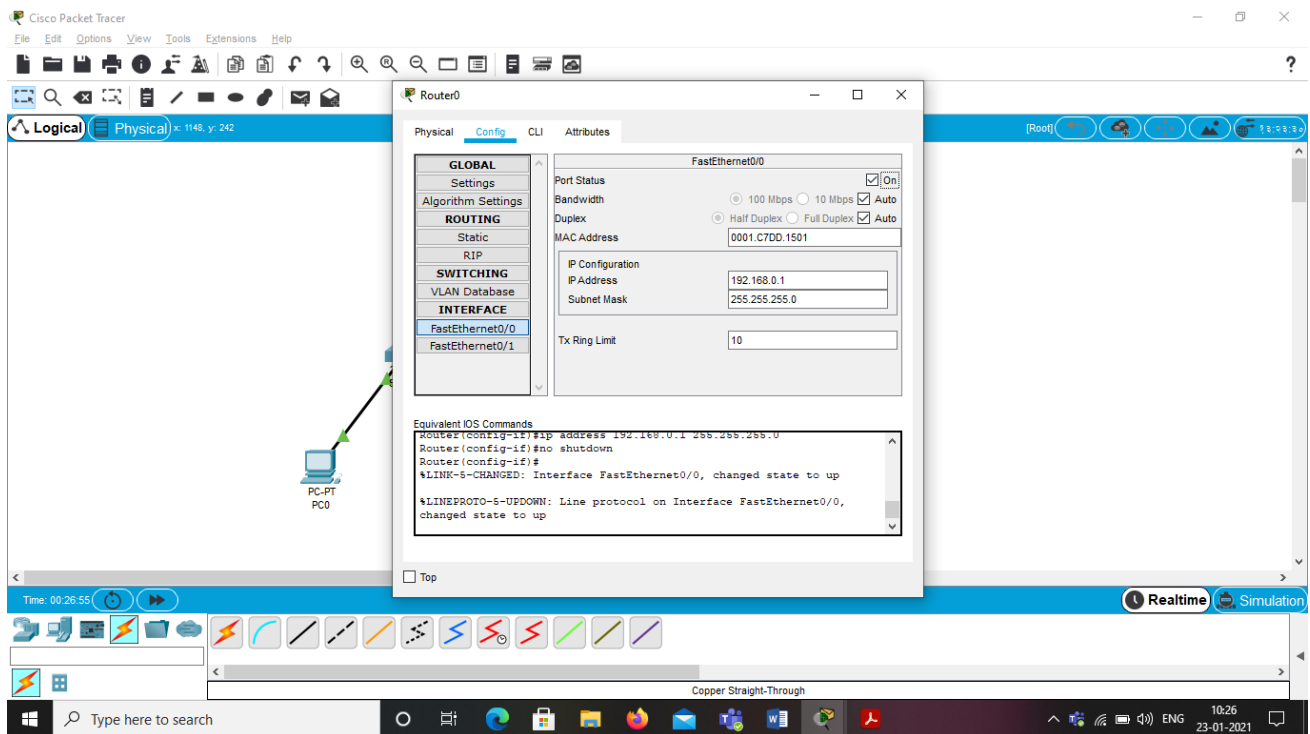
Use another network address for second network.



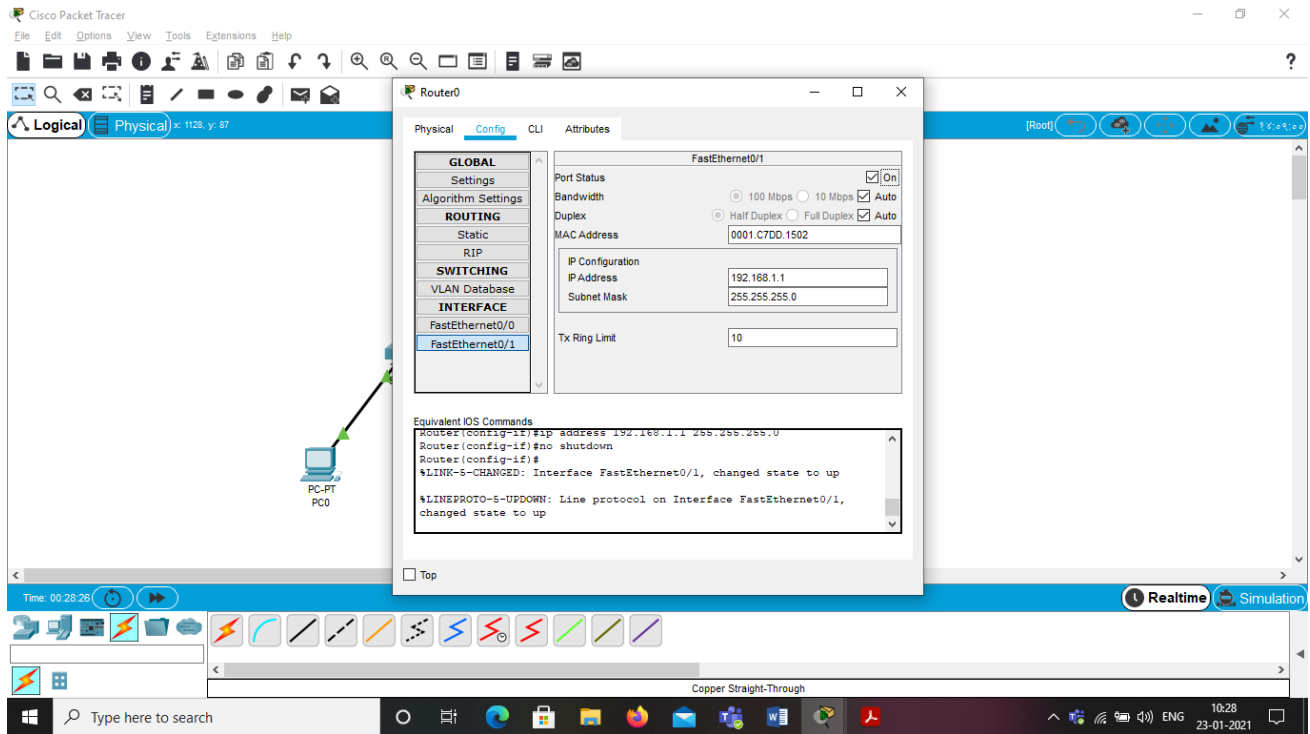


Step 3: Assign the IP address for router

Assign the gateway address of 1st network and don't forget to turn on the port status

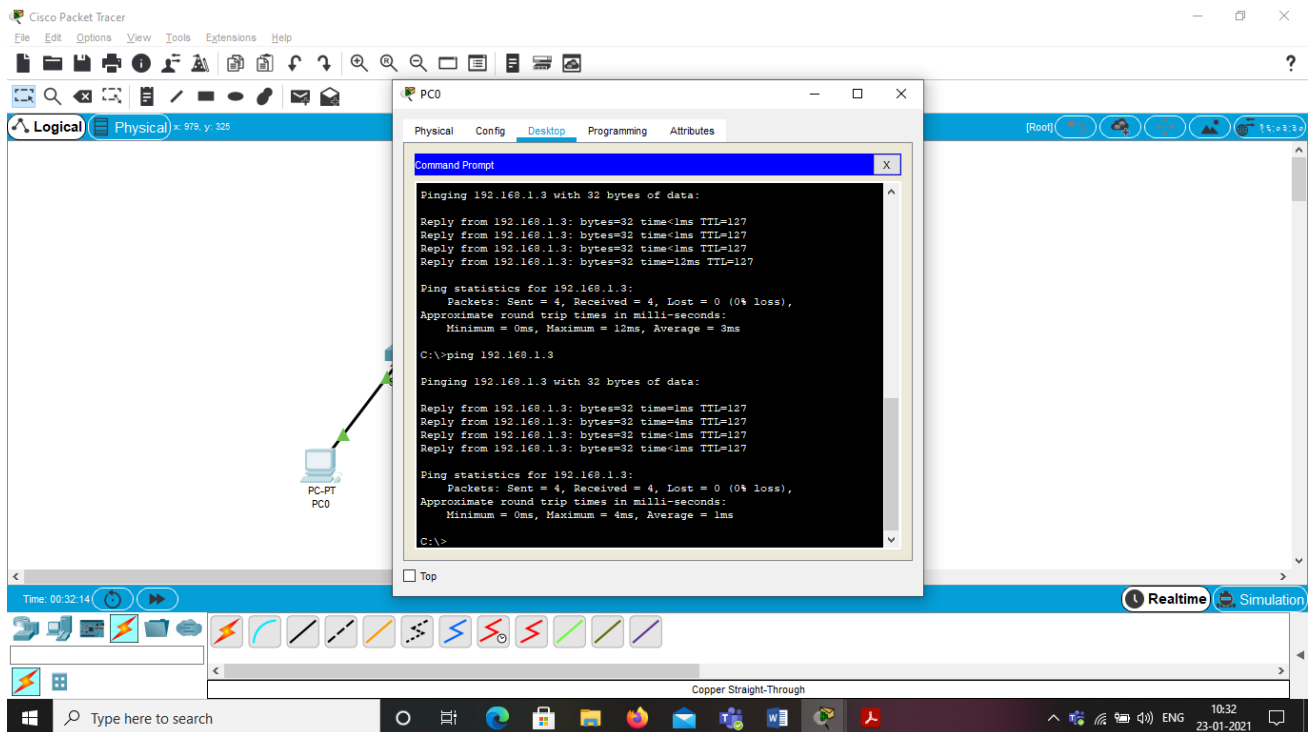


Assign the gateway address of 2nd network for FastEthernet0/1 interface

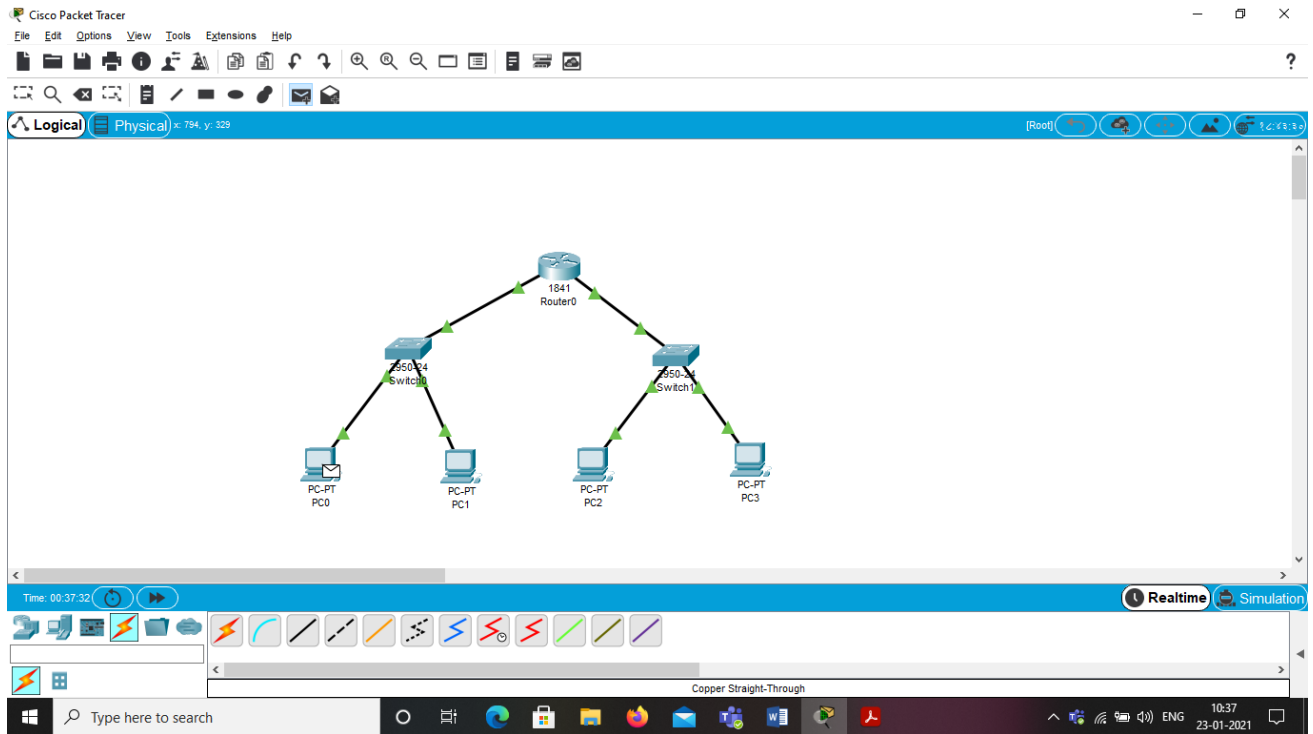


Step 3: Check the connectivity from one network to another network

Select any PC from 1st network go to Desktop tab->Command Prompt->execute ping command for the 2nd network.



Step 4: Send Simple PDU.



Step 5: Check in simulation mode

