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*

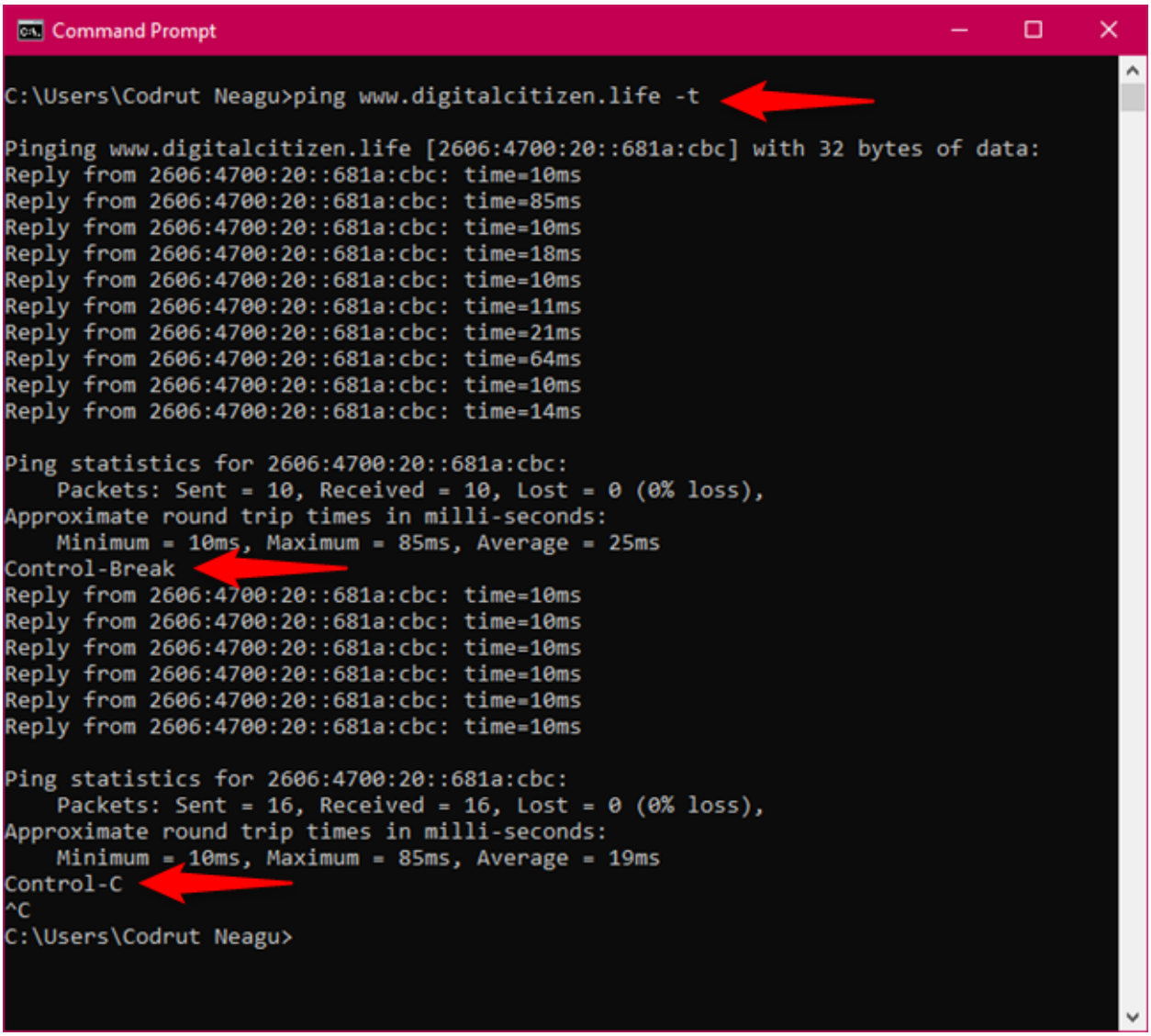
By default, ping sends four ICMP Echo Request packets each of 32 bytes. The response packets are called ICMP Echo Reply Packets.

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.

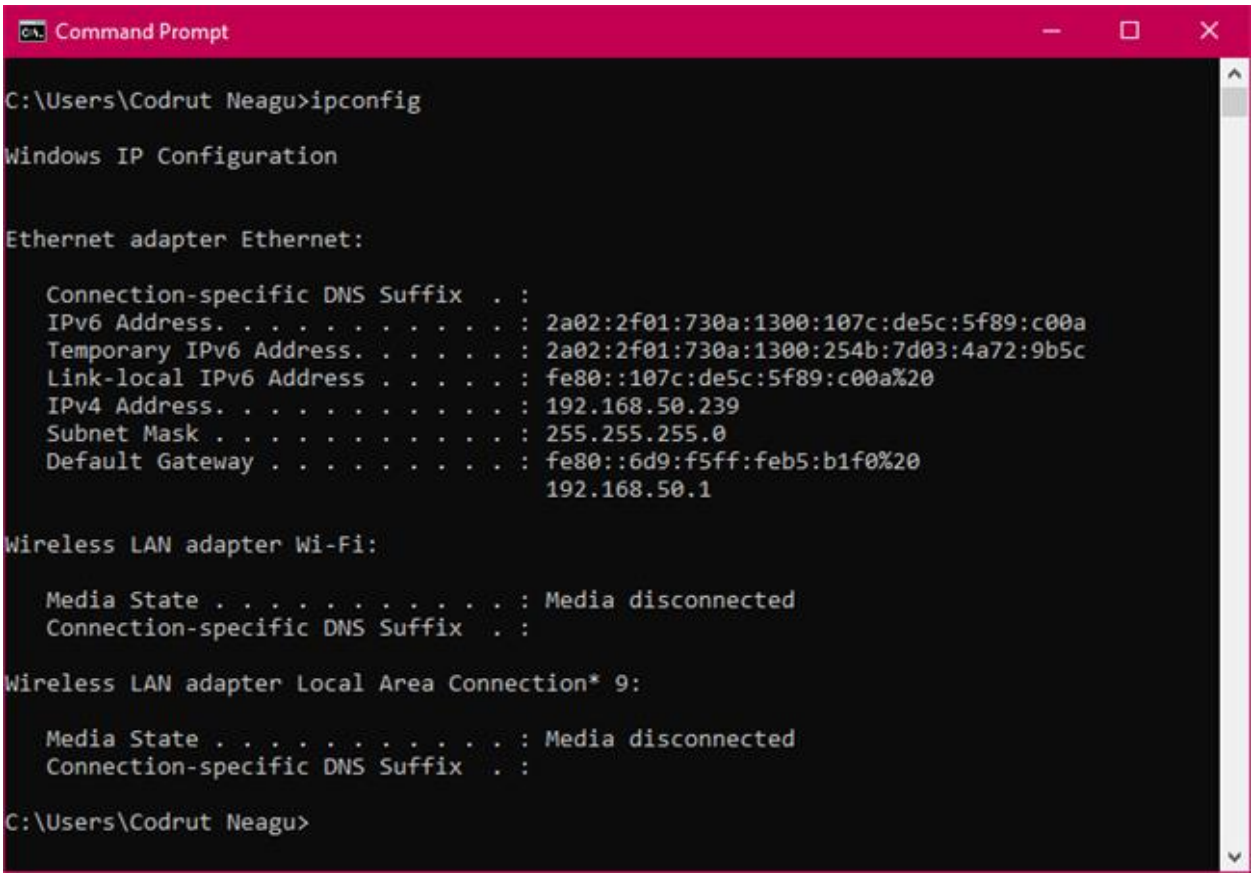
- "–t" switch will continue to send packets to the destination until user stops this by pressing *Ctrl + C*



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.



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

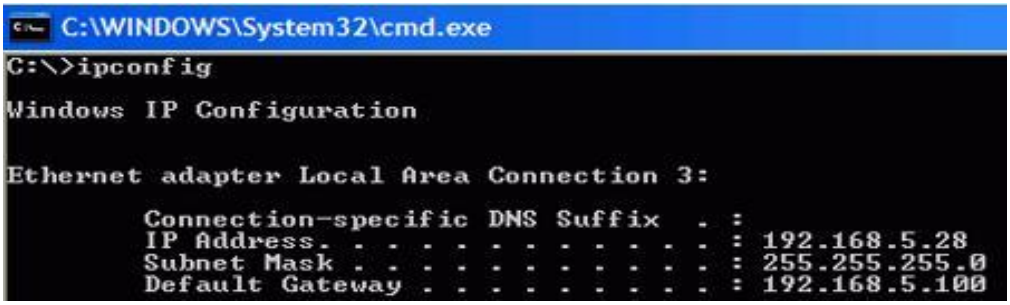
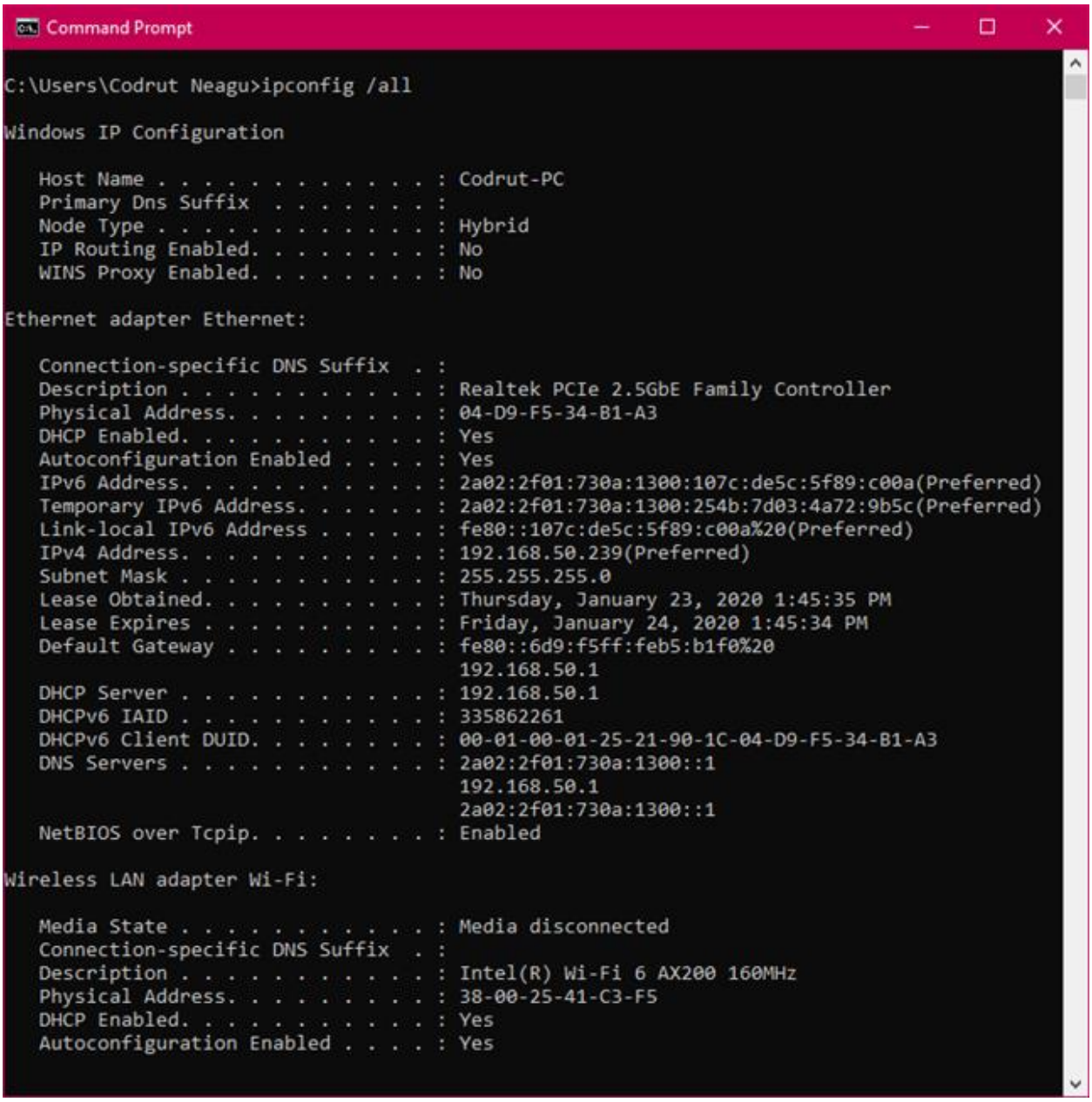


Figure 2: The IPCONFIG Command

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.



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.

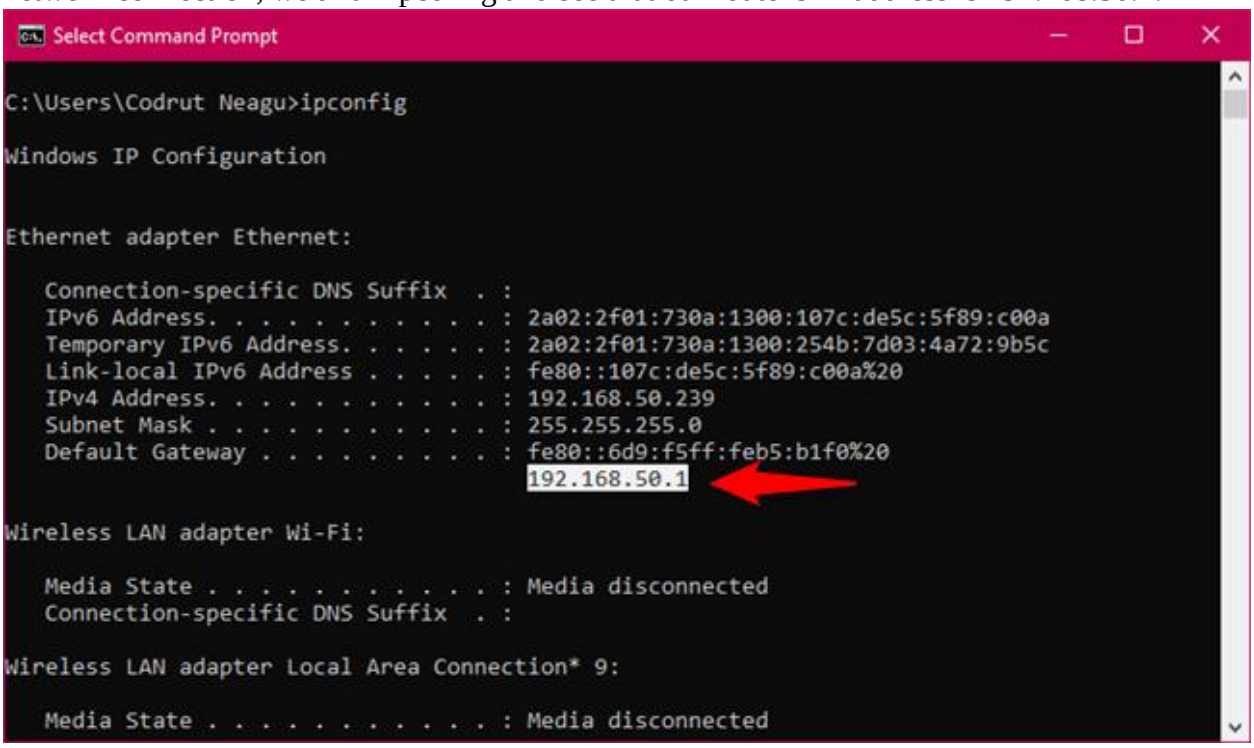


Figure :Running ipconfig to identify the IP address of the router

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.

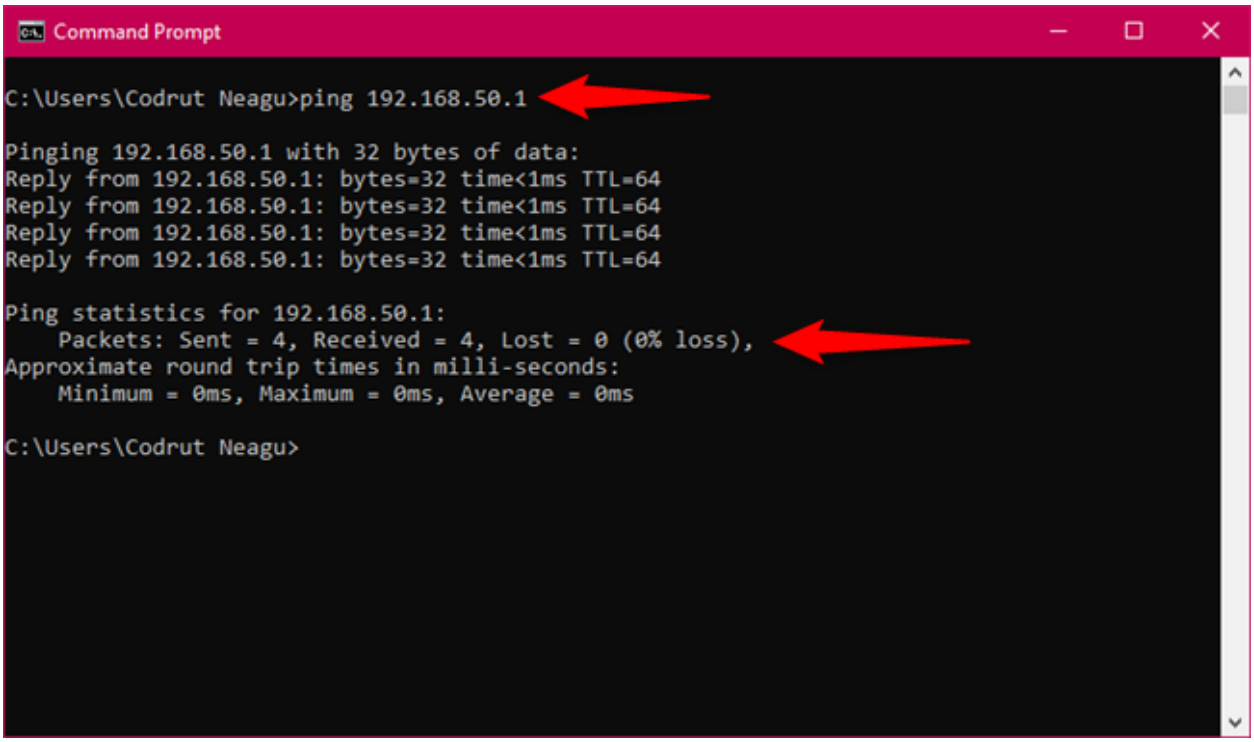


Figure:Pinging the router to check the network connection

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.

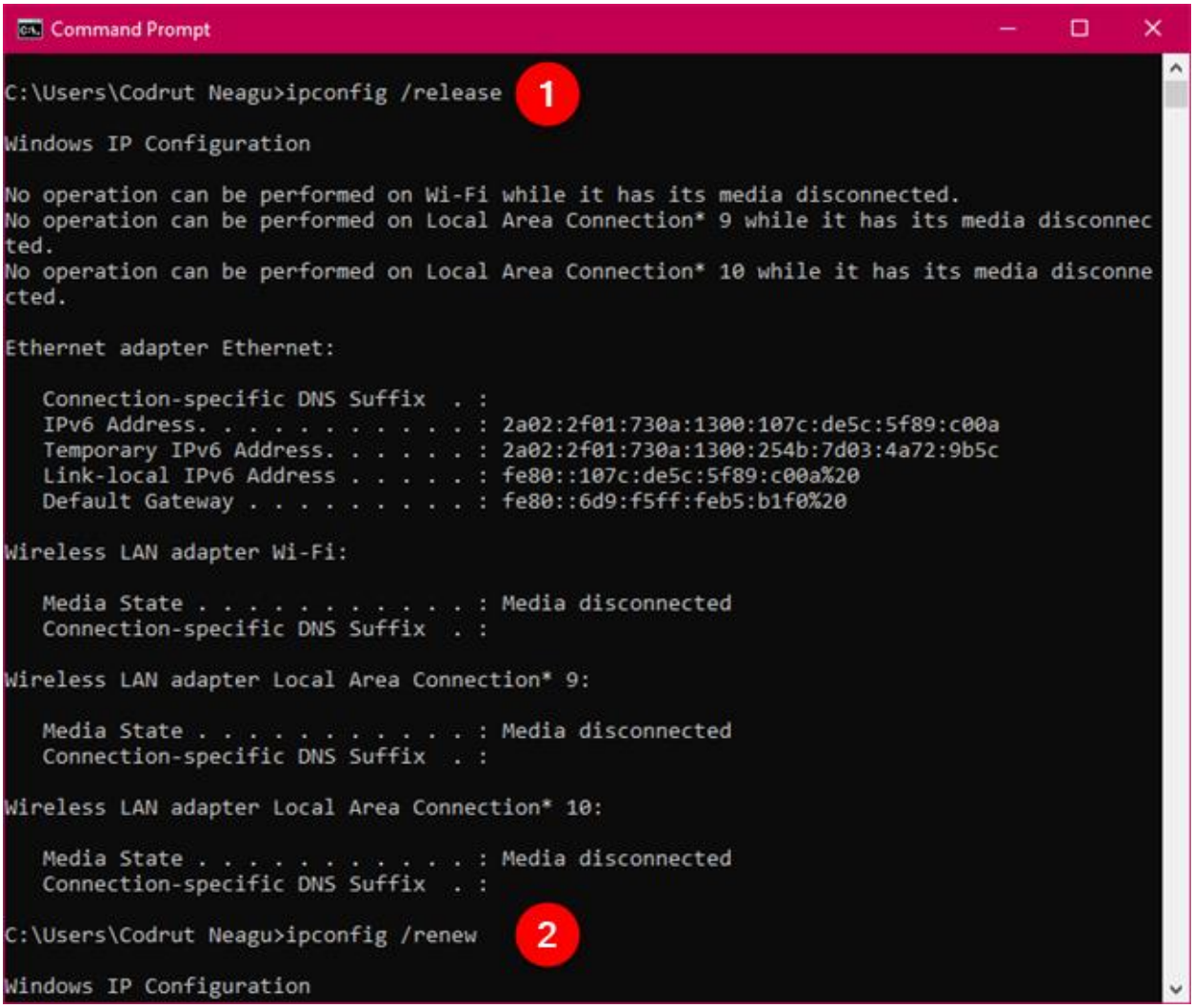
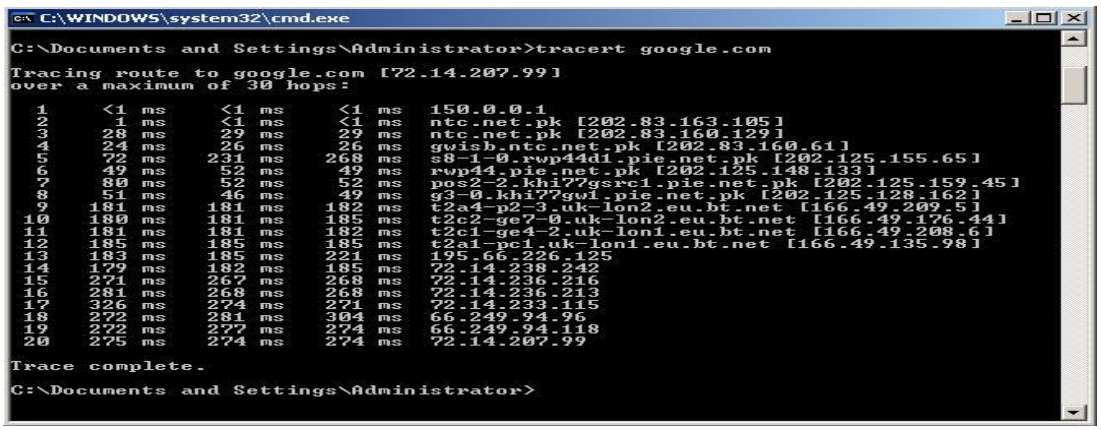


Figure: Running ipconfig /release and ipconfig /renew to reset the IP address

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



4. NSLOOKUP Command

Displays the default DNS server information.

Type the following command

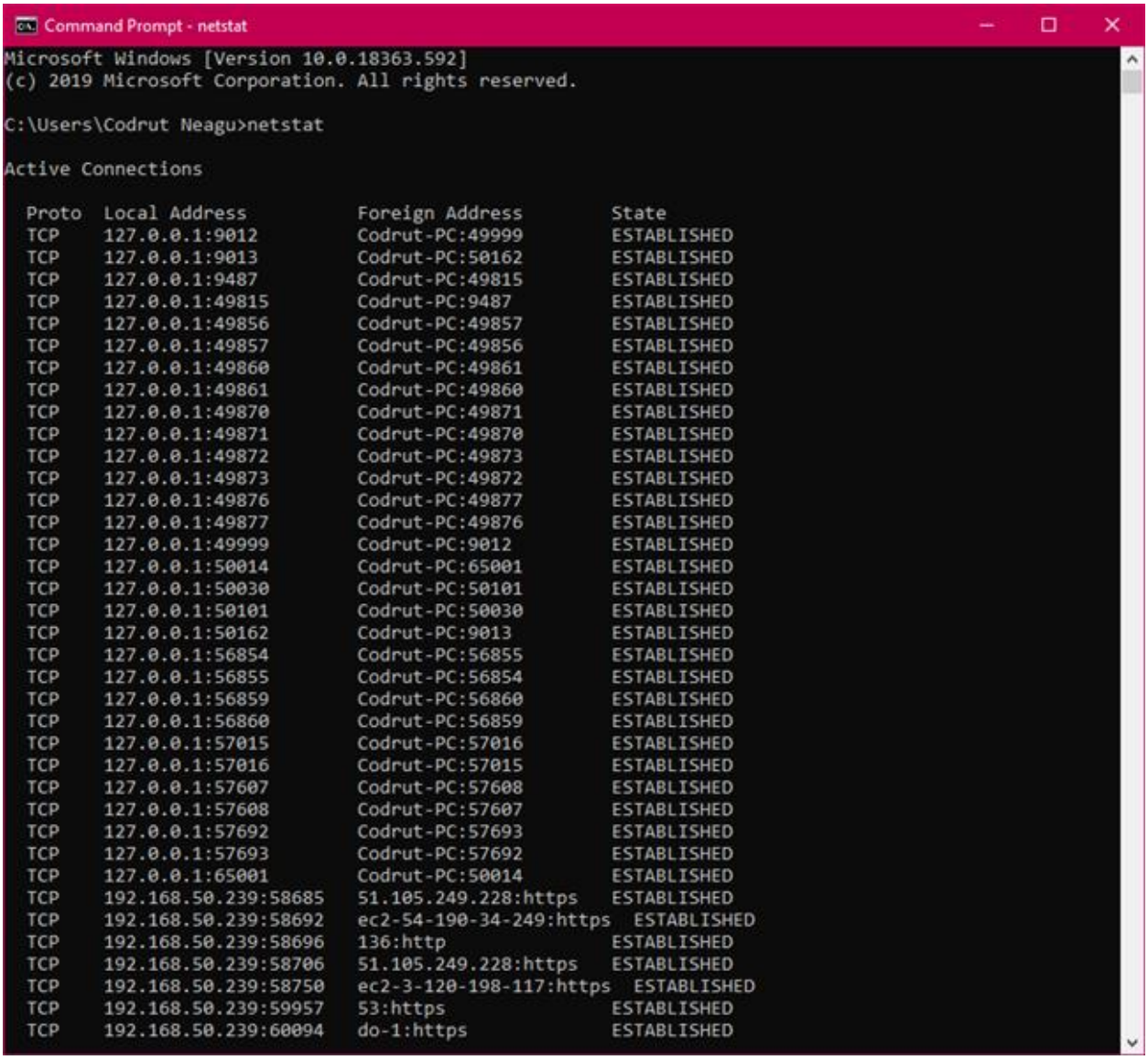
C:\>nslookup

What is your default DNS server's IP address?

5 . NETSTAT Command

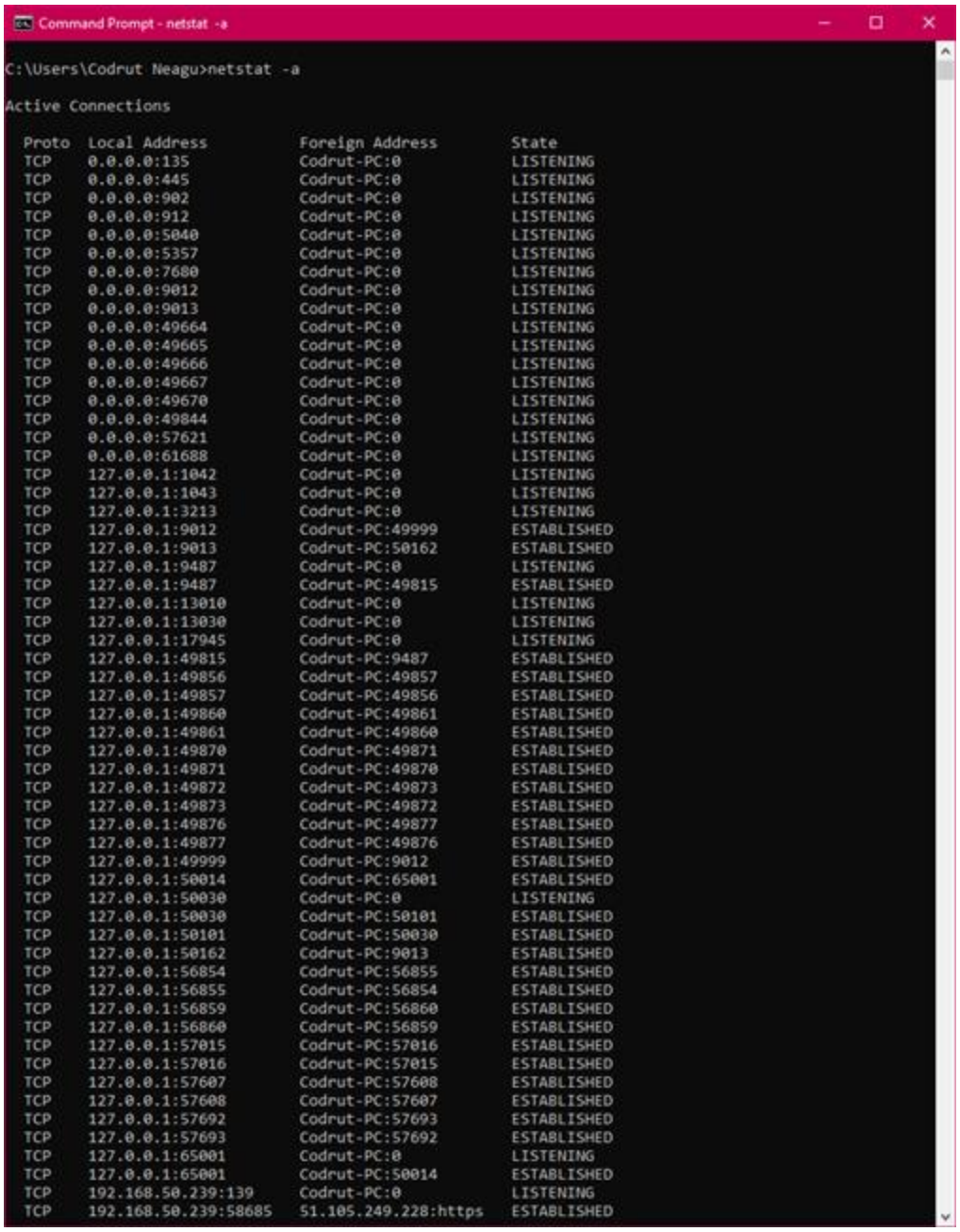
You can get other useful cmd nic info from the netstat command, which lets you see the network connections that are active between your system and any other systems on your network or the internet.

Displays active TCP and UDP connections.
Practice the following commands
C:\>netstat
C:\>netstat -a
C:\>netstat –an



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.



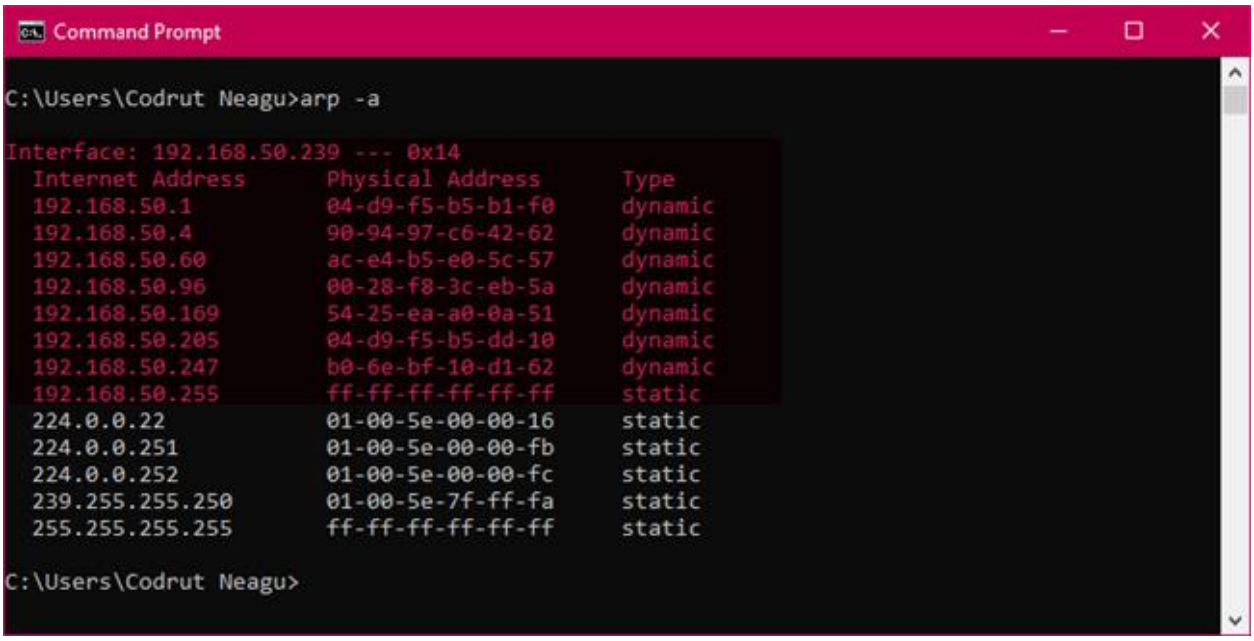
Netstat -a displays the active network connections, open ports and listening ports

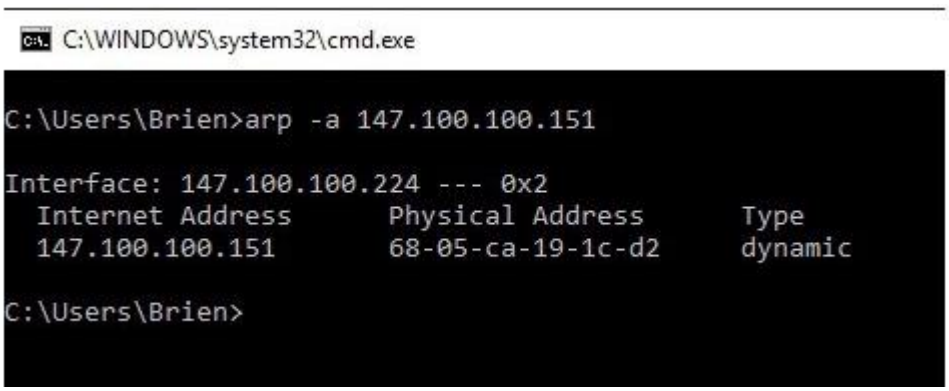
6. ARP Command

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.



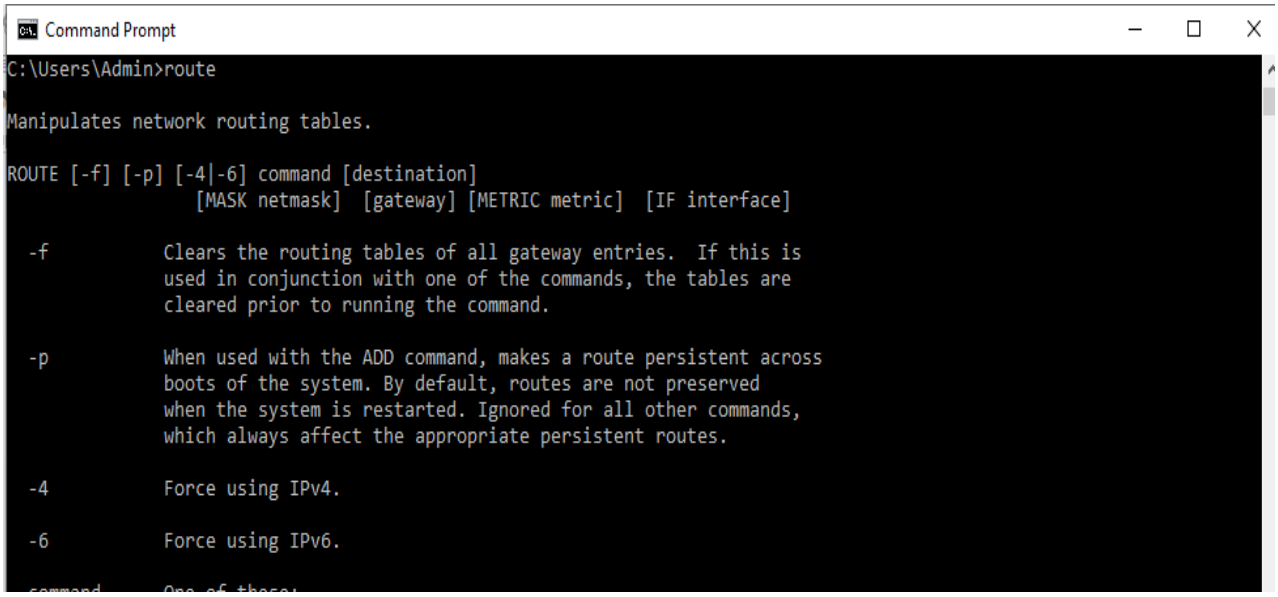


7.NbtStat-n Command

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.

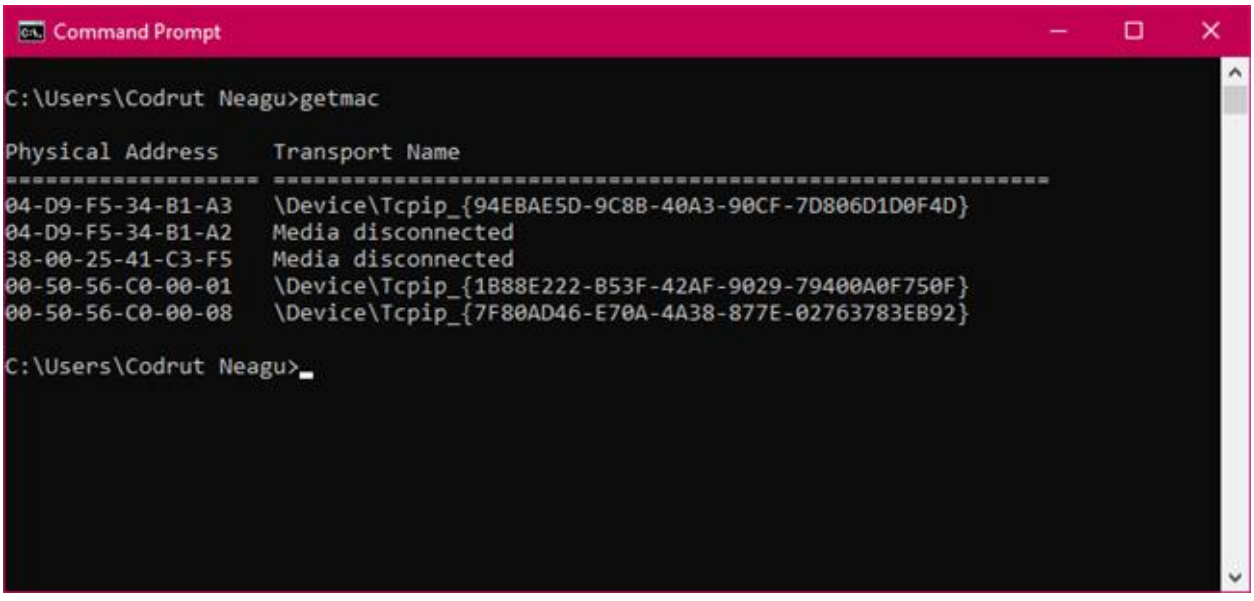
8.Route Command

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.



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.



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

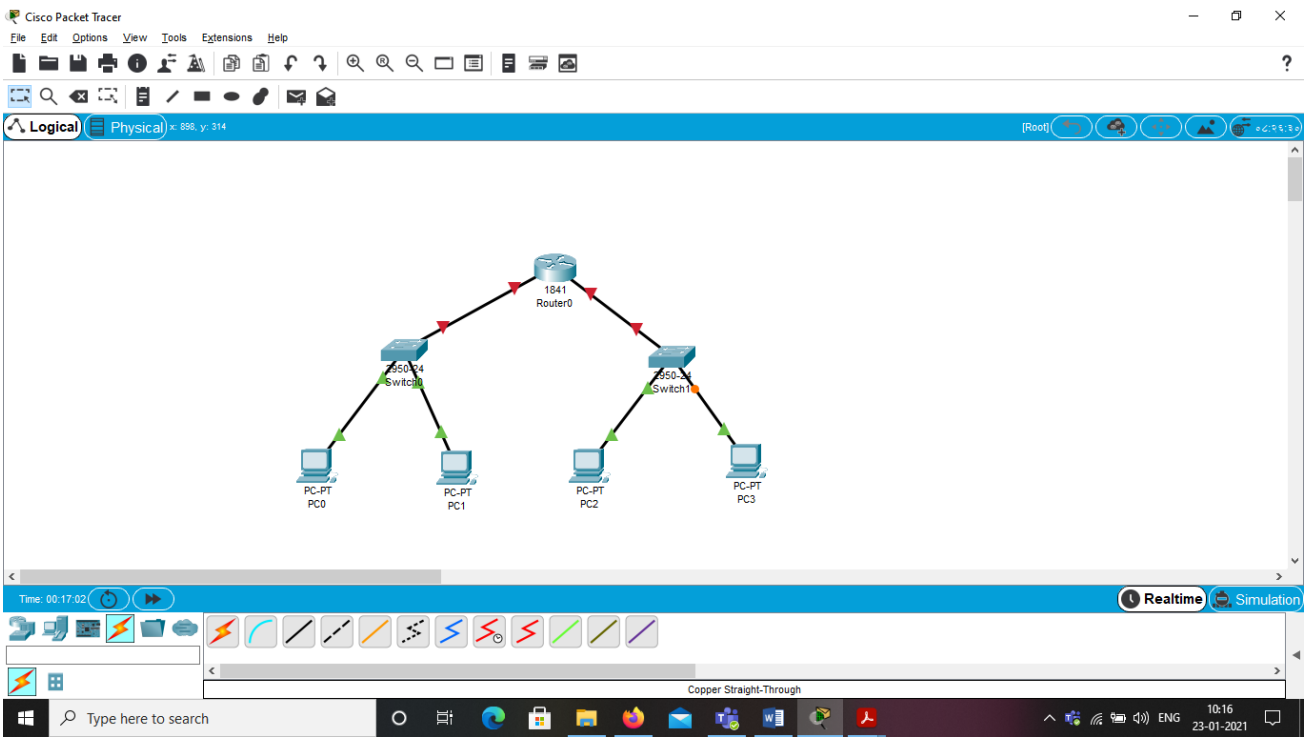
Cisco Packet Tracer tool

Packet Tracer – Creating a New Topology

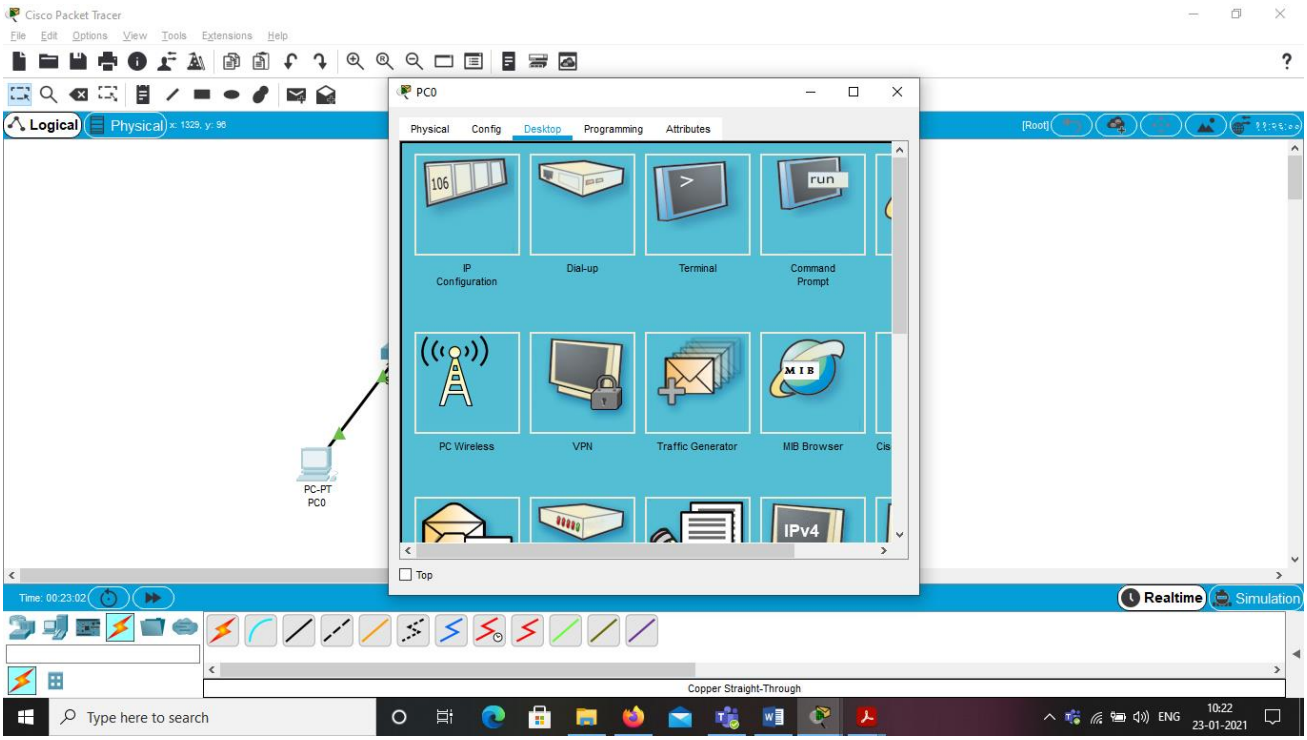
What is Packet Tracer? Packet Tracer is a protocol simulator developed by Dennis Frezzo and his team at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either Real Time or Simulation mode. This includes layer 2 protocols such 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.

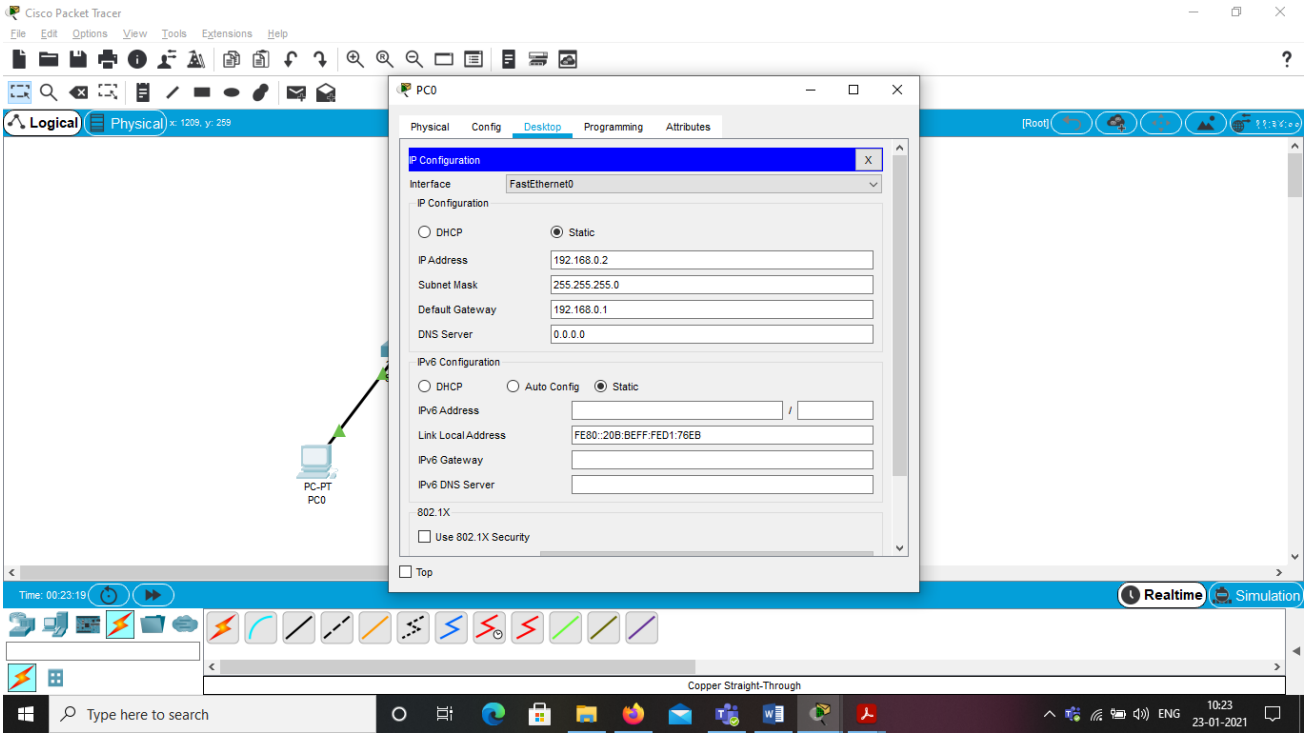
Exp 1: Configuration of Router using cisco packet tracer

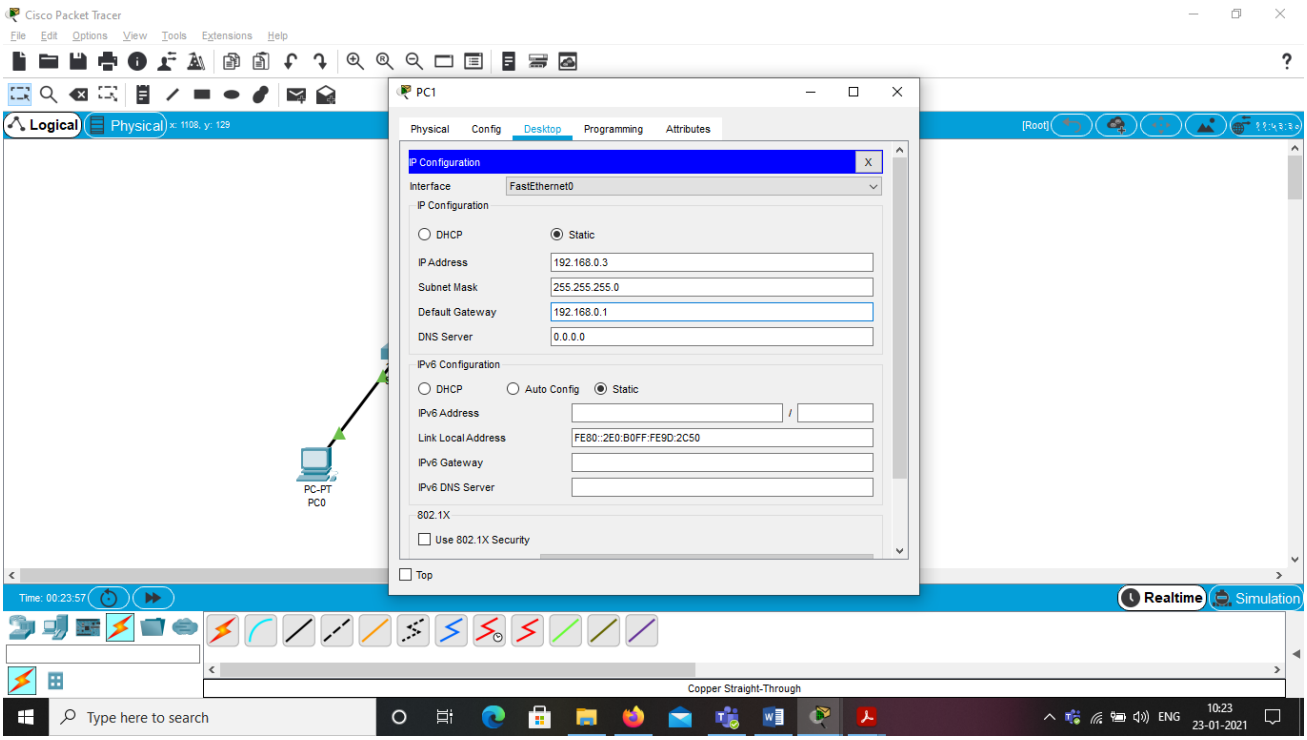
Step 1: Construct the topology



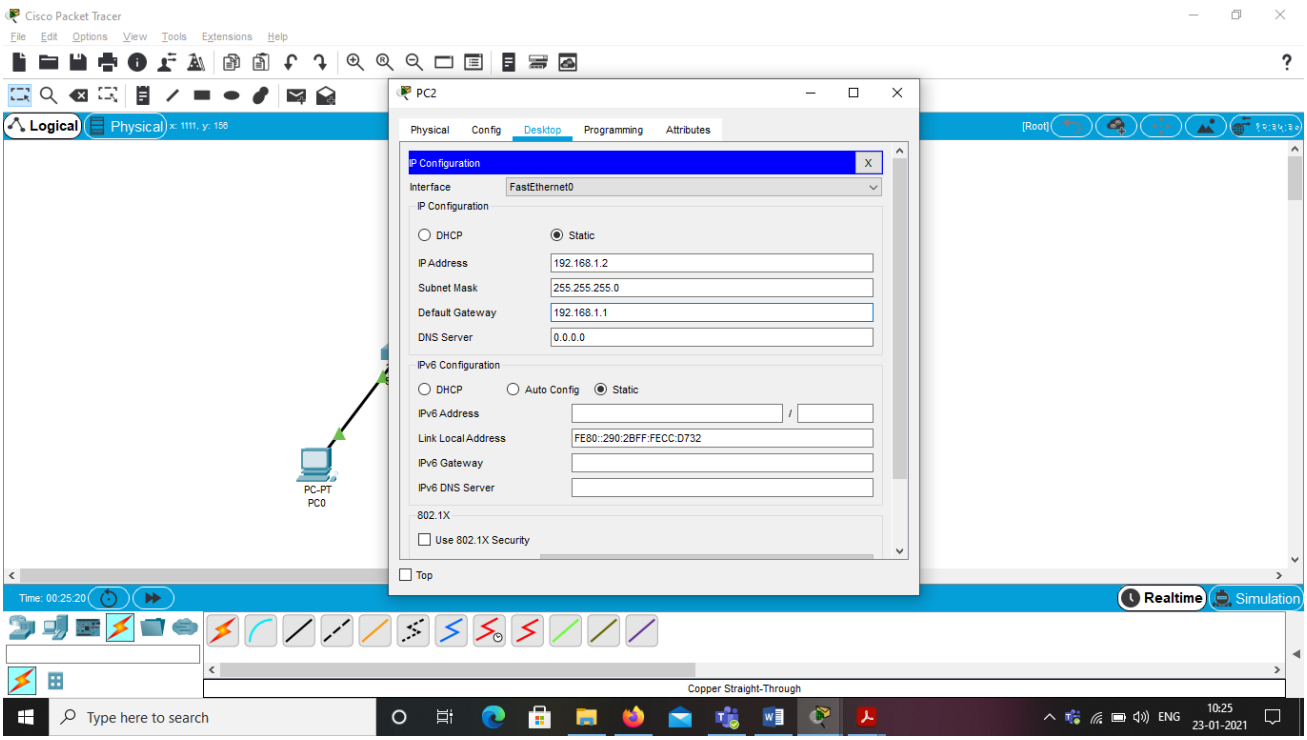
Step 2: Assign IP addresses to all PC's.

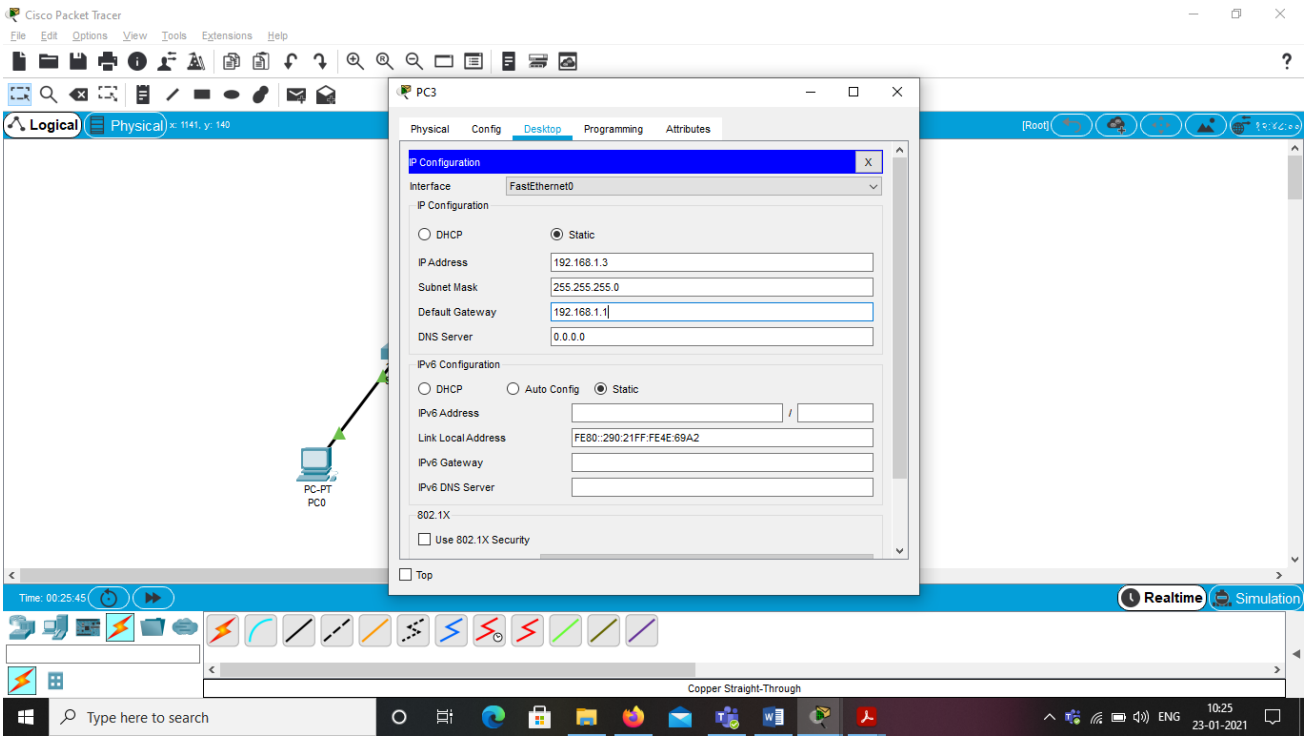

Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical Physical x: 1329, y: 96
[Root]
PC0
Physical Config Desktop Programming Attributes
IP Configuration
Dial-up
Terminal
Command Prompt
PC Wireless
VPN
Traffic Generator
MIB Browser
IPv4
Top
PC-PT PC0
Time: 00:23:02
Realtime Simulation
Copper Straight-Through
Type here to search
ENG 10:22 23-01-2021


Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical Physical x: 1209, y: 259
[Root]
PC0
Physical Config Desktop Programming Attributes
IP Configuration
Interface FastEthernet0
IP Configuration
DHCP Static
IP Address 192.168.0.2
Subnet Mask 255.255.255.0
Default Gateway 192.168.0.1
DNS Server 0.0.0.0
IPv6 Configuration
DHCP Auto Config Static
IPv6 Address
Link Local Address FE80::20B:BEFF:FED1:76EB
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Top
PC-PT PC0
Time: 00:23:19
Realtime Simulation
Copper Straight-Through
Type here to search
ENG 10:23 23-01-2021



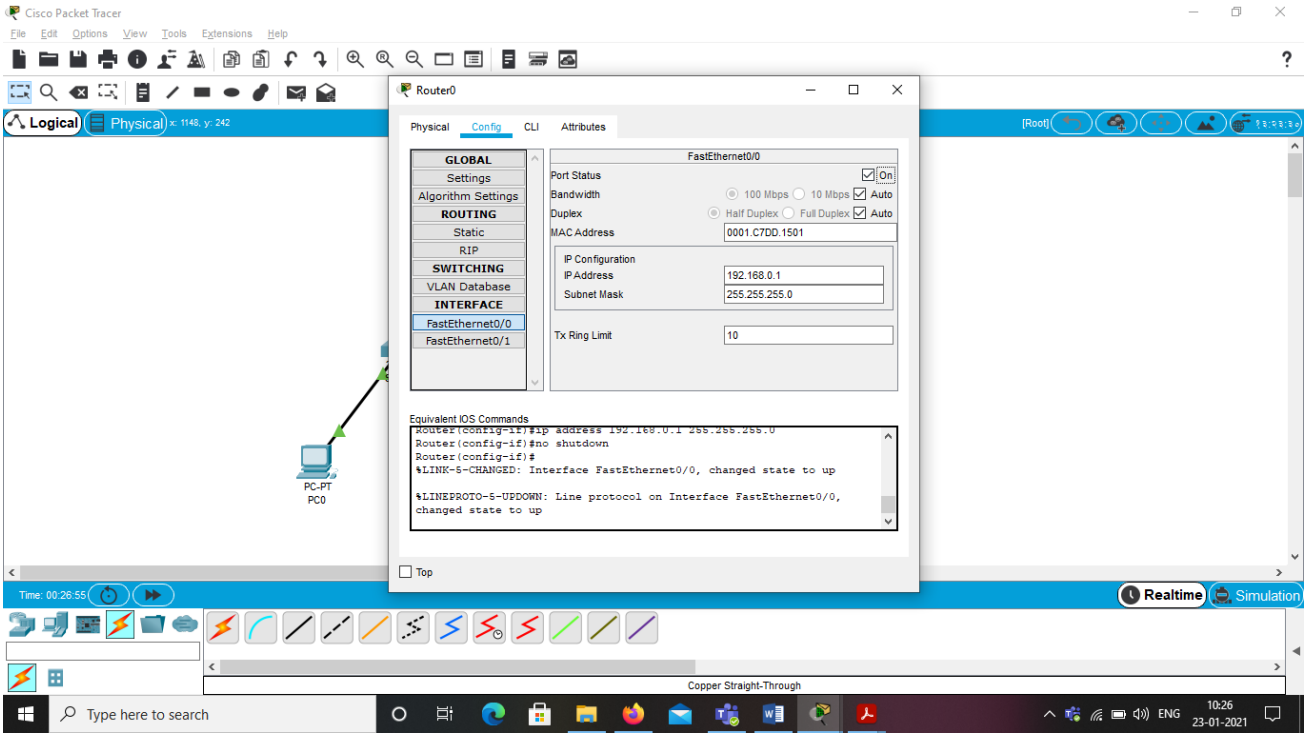
Use another network address for second network.



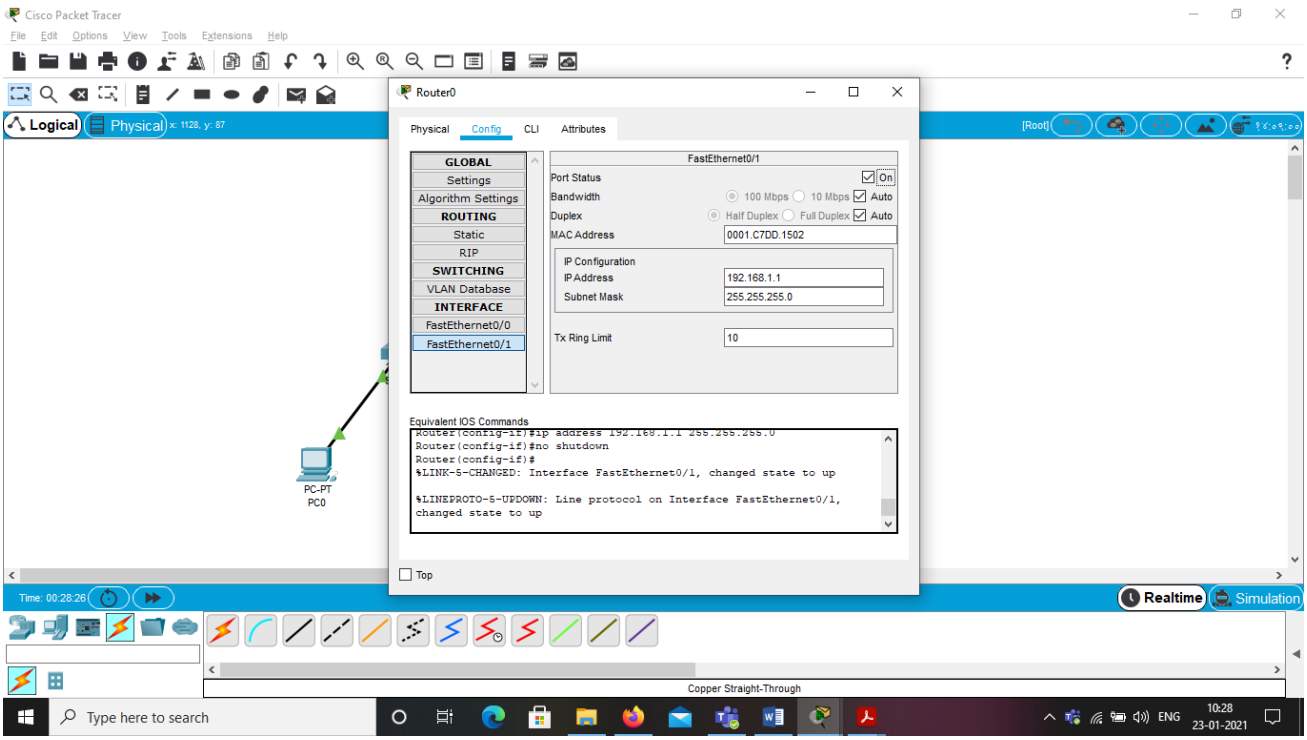


Step 3: Assign the IP address for router

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

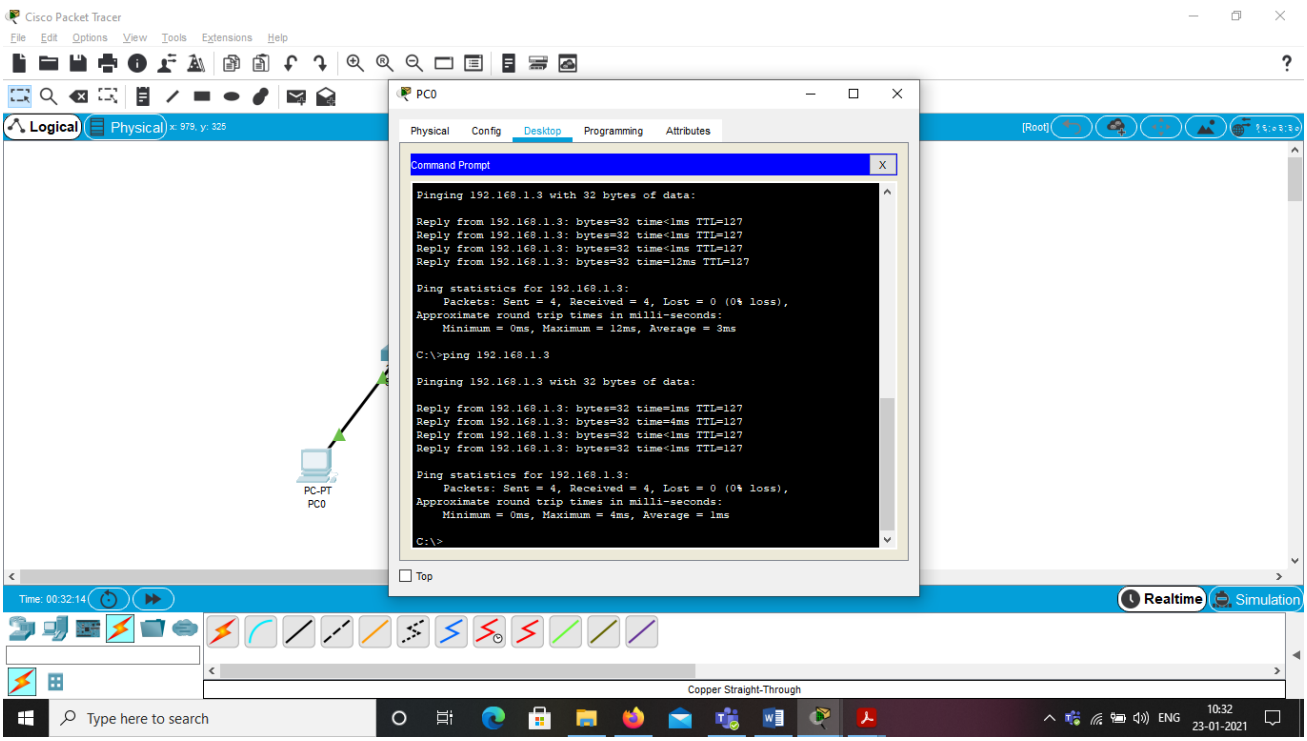


Assign the gateway address of 2nd network for FastEthernet0/1 interface

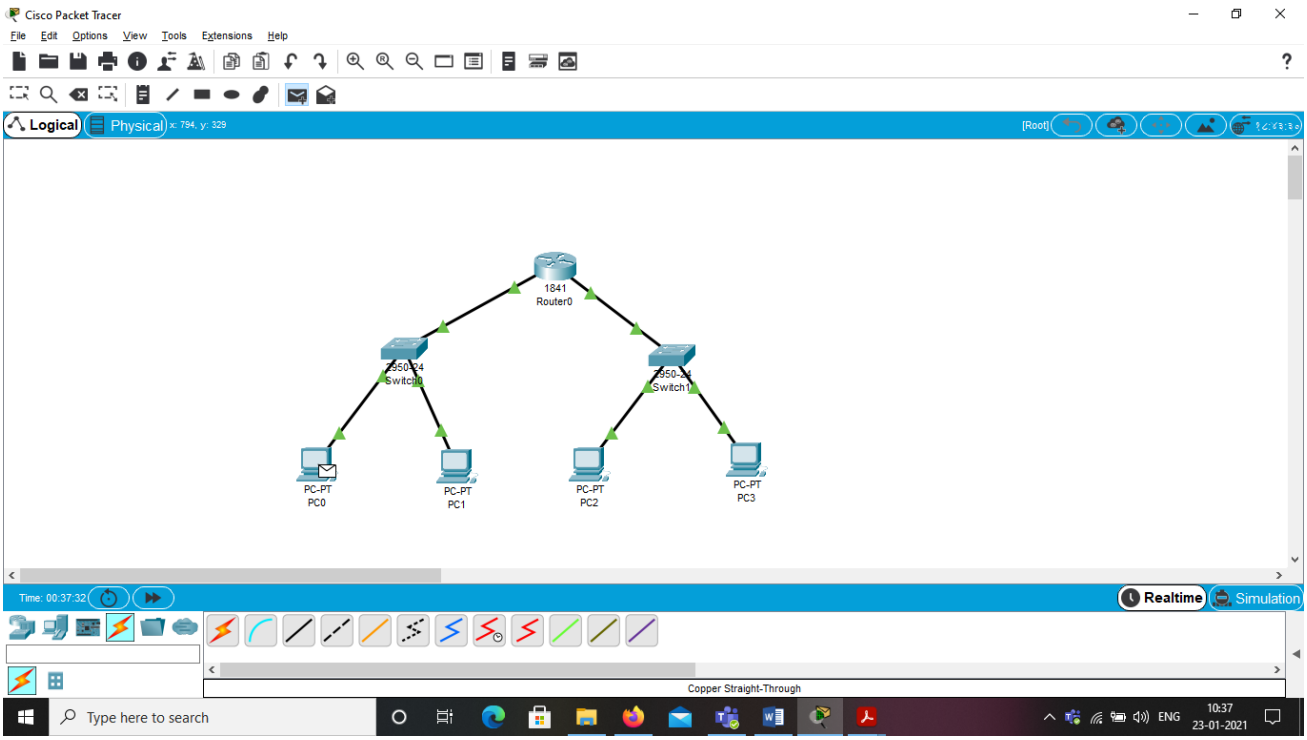


Step 3: Check the connectivity from one network to another network

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