



Computer Networks-Lab 04



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CL30001 – Computer Networks-Lab

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NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES, FAST- PESHAWAR CAMPUS
Department of Computer Science & Software Engineering

Computer Networks - Lab 04

OBJECTIVES

After these Lab students shall be able to perform

- Understanding of Application layer and its protocols
- Configuring DHCP server on a Router..
- Configuring DHCP service on a generic server in Packet Tracer.
- Web Server Configuration in Cisco Packet Tracer
- Configuring DHCP, DNS and Web Server configuration in cisco packet tracer

PRE-LAB READING ASSIGNMENT

Remember the delivered lecture carefully.

Computer Networks Lab 4

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How to Share Files between Two Computers Using LAN Cable



Over the years, Wi-Fi has grown tremendously but sharing huge files or for that matter, a whole drive is still not efficient. You get cramped up speed and your data is running through a public channel. I would any day prefer sharing a drive or transferring data over LAN cable. On that note, the following is the step by step guide to transfer files between PC's using an Ethernet cable.

Just in case, if the file you want to transfer is small and the systems are in the same network then consider doing it over Wi-Fi. Here are a few software to use to transfer data over Wi-Fi.

When to Use LAN Cable

Dropping an Ethernet cable makes things simple with faster data speed. The cheapest of CAT5e cable supports speeds up to 1000 Mbps. To give you some perspective, USB 2.0 supports speeds up to 480 Mbps. So, transferring data over Ethernet should be the obvious choice.

The advantage of LAN cable Over others

The main advantage of using the ethernet cable method is faster transfer speeds, at least faster than your regular flash drives and Wi-Fi. If you have a lot of data to transfer then using the ethernet cable is the best way to go. We have tested this on all mainstream Windows versions. i.e, on Windows 7, 8, and 10.

Things You Need

- Two Windows computers obviously
- A LAN cable, CAT 6 will work fine
- A bit of time and patience (if it's your first time)

Share Files Between Two Computers Using LAN Cable

Step 1: Connect Both PCs With LAN Cable

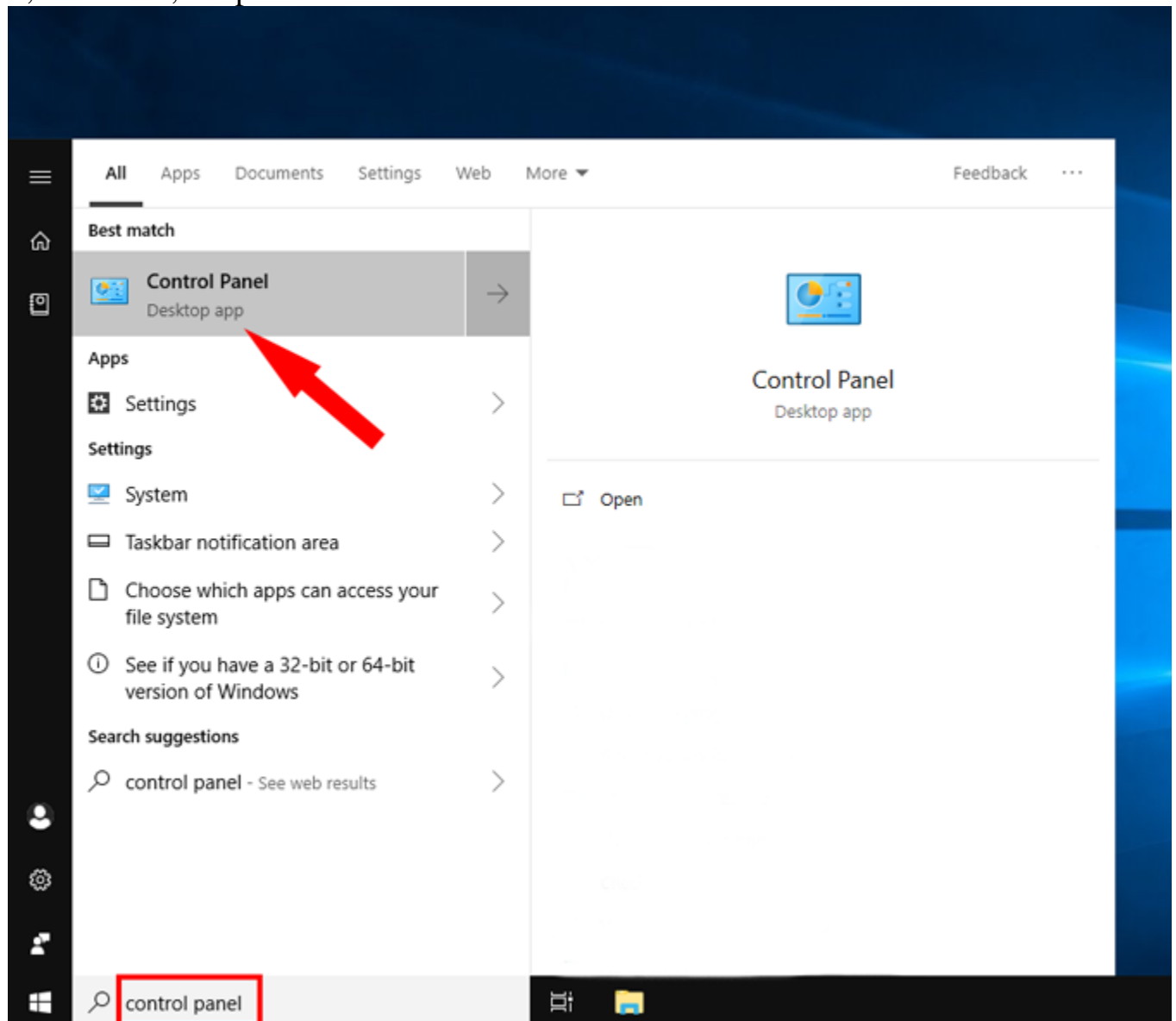
Connect both computers to a LAN cable. You can use any LAN cable (crossover or ethernet cable); it doesn't matter on a modern computer. Because both of them use the same port and have very few functional differences.



Step 2: Enable Network Sharing on Both PCs

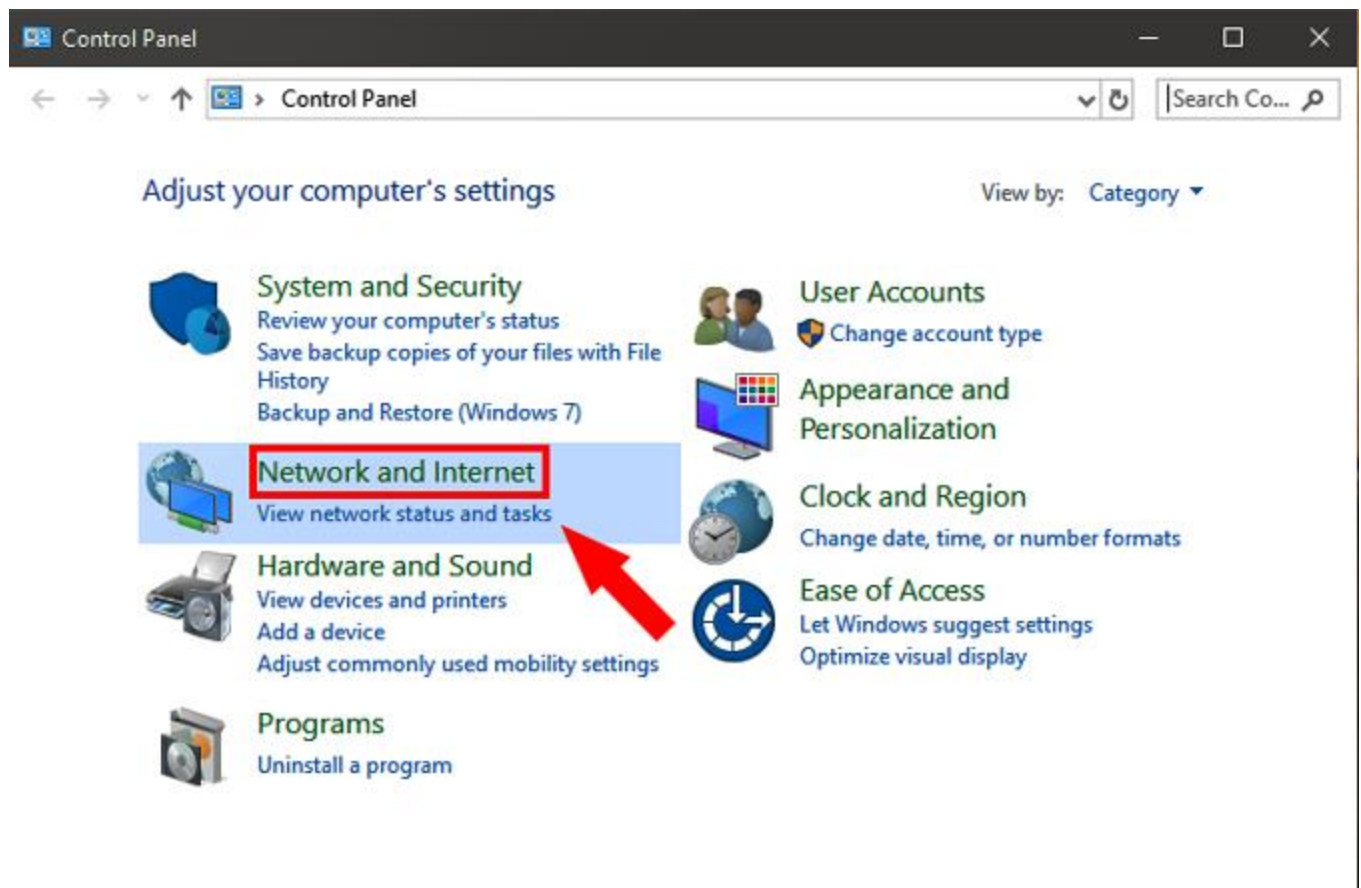
Now that you have physically connected both PCs with a LAN cable, we have to turn on Network Sharing on both computers to exchange files between them. It is a simple process step-by-step process. Make sure you do this on both PCs.

To enable sharing, go to the Start menu and search “Control Panel”. Once you see it, click on it, to open it.



Once the Control Panel window opens, click on Network and Internet.

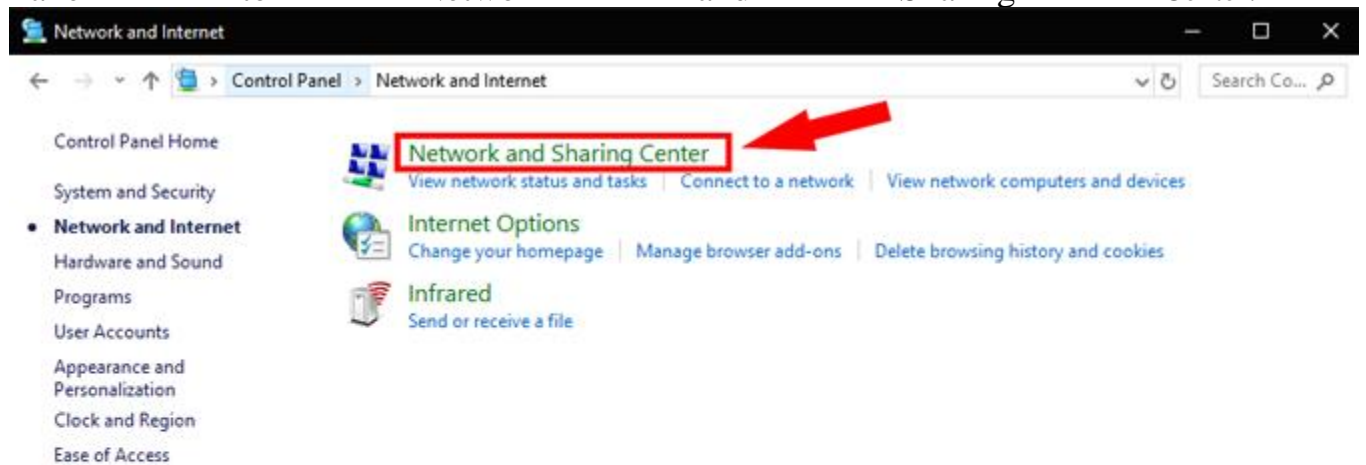
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In the next dialogue box, open Network and Sharing Center. Alternatively, you can also type “Control Panel\Network and Internet\Network and Sharing Center” in the search box of Control Panel and hit Enter key. This will redirect you from Control

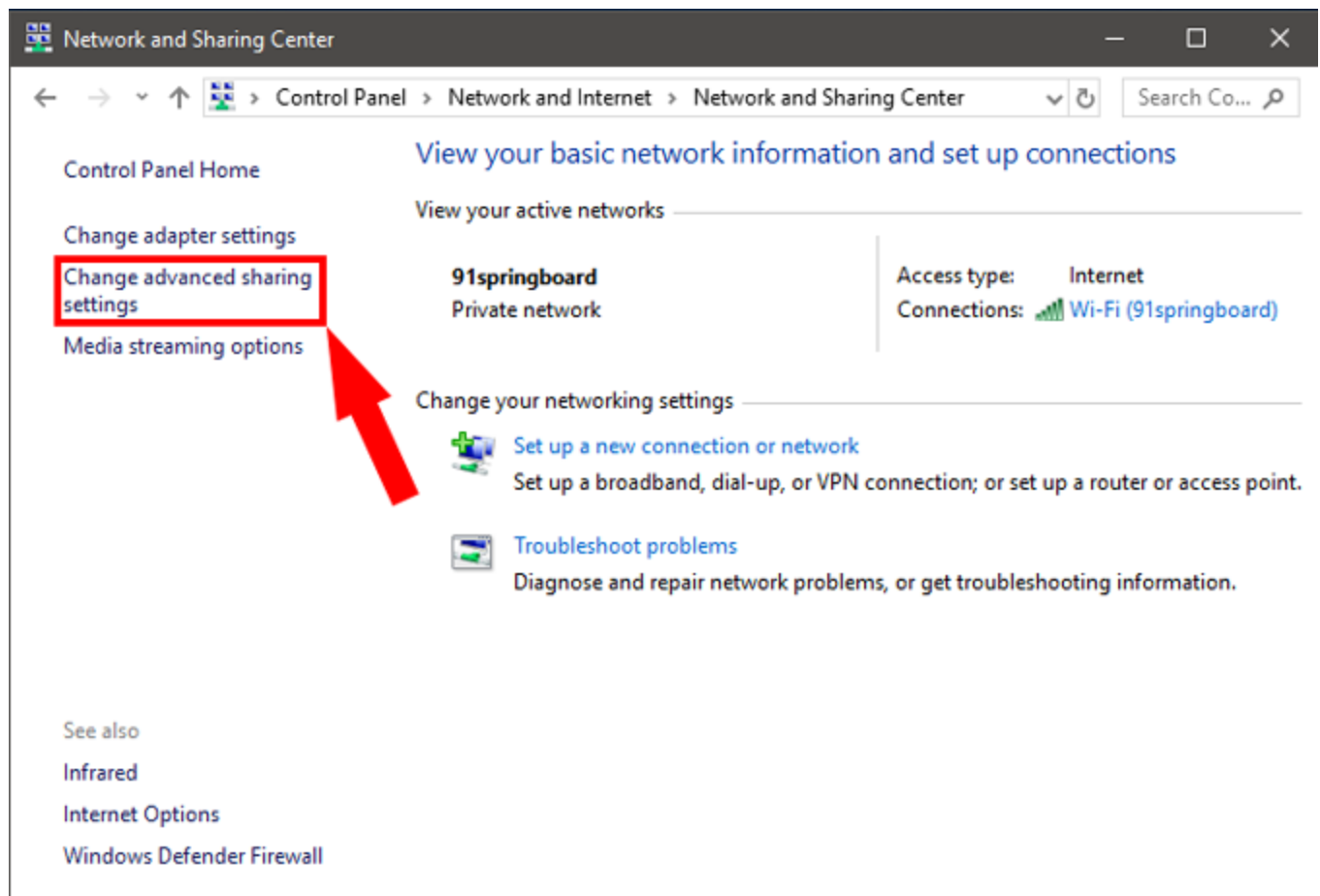
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Panel to Network and Sharing Center.

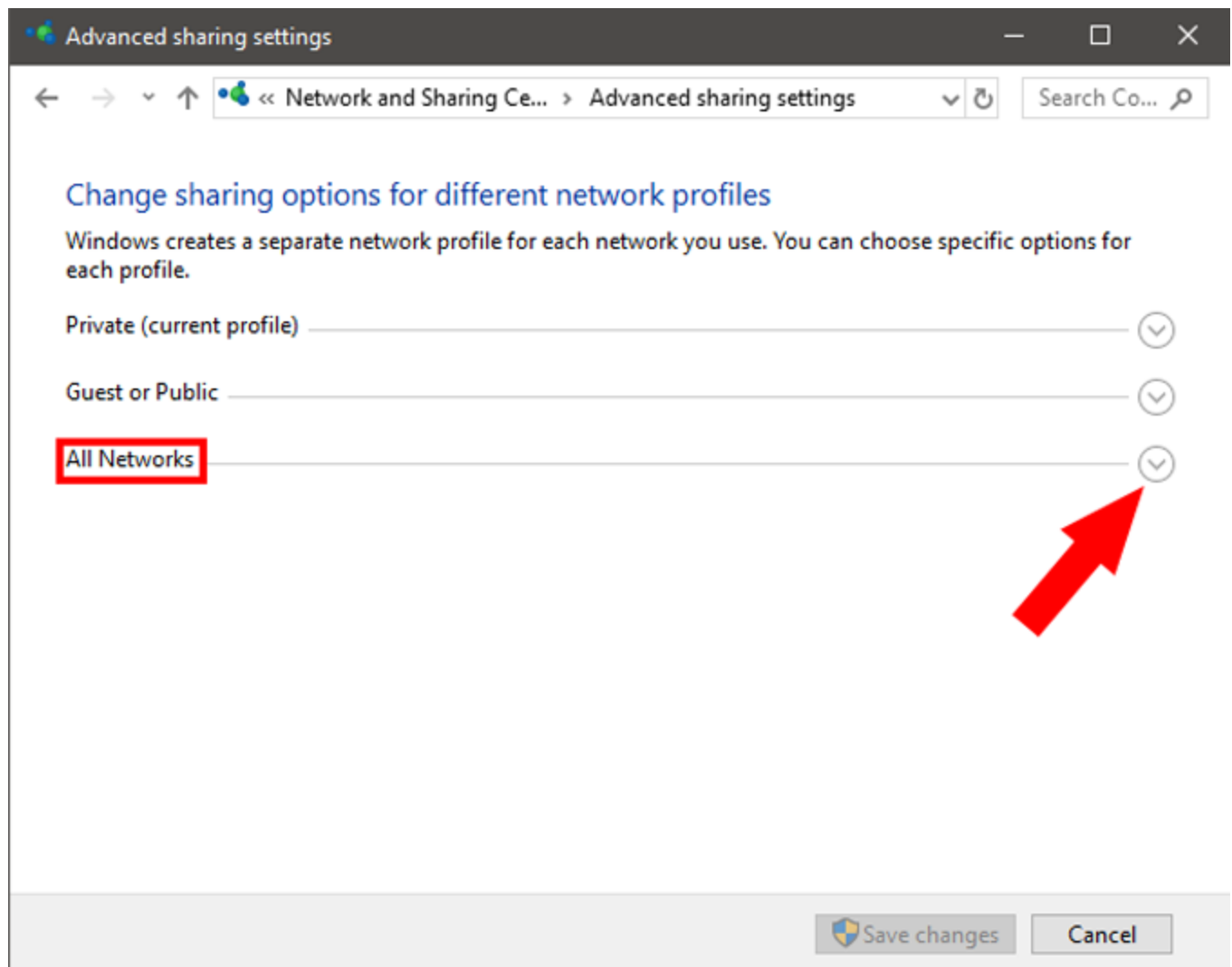


On the left-hand side of 'Network and Sharing Center' window, click on "Change advanced sharing settings".

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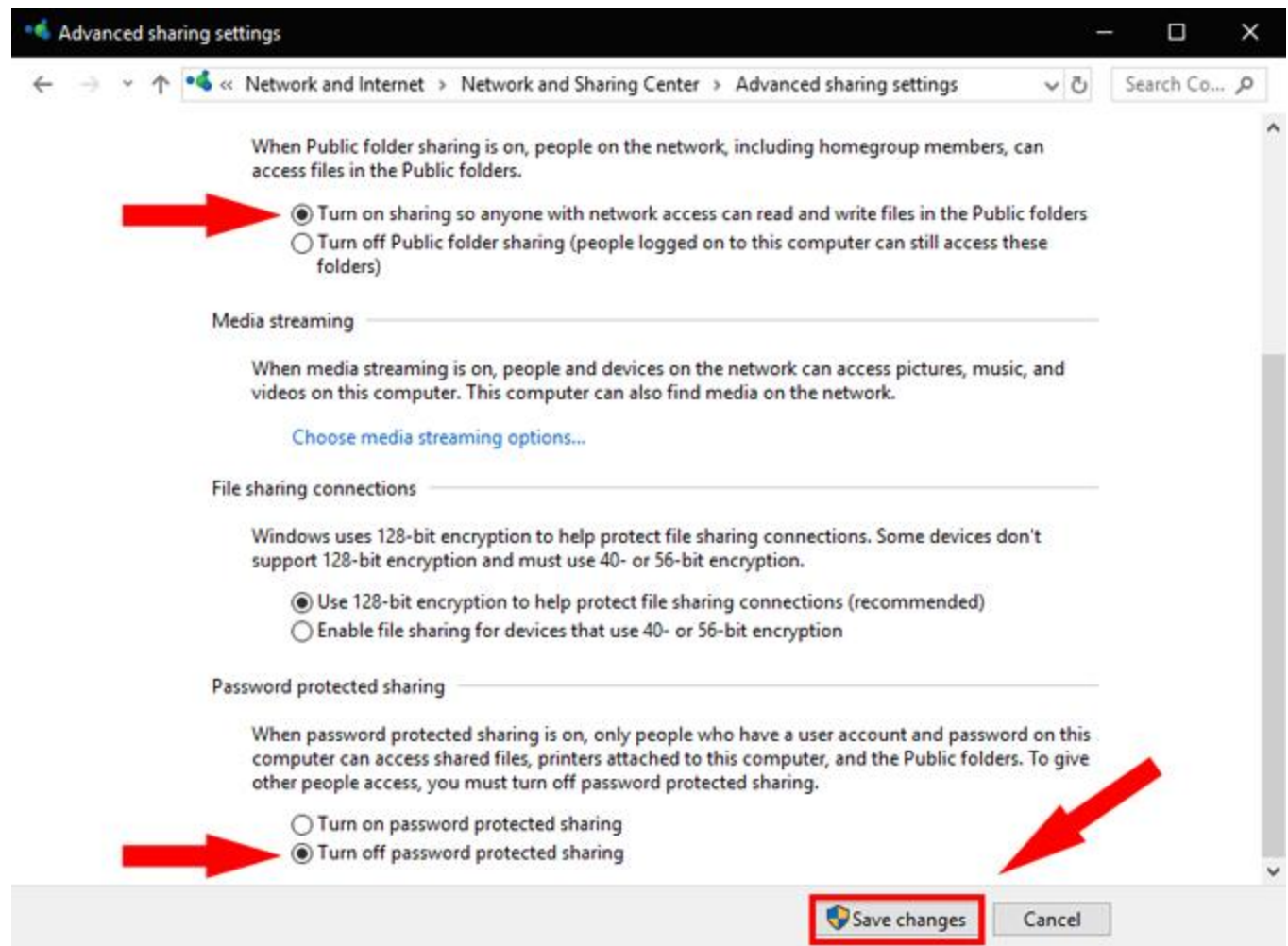


Here, you'll find three networks – Public, Private and All Network. Public Network is for places like airports and coffee shops, Private network is for an organization or your home network and All Network comprises of both. To make sure, the setup is flawless, we'll recommend you choose "All Networks".



Next, expand All Networks by clicking on the drop-down icon. Here, we need to enable Public Sharing so that the PCs can access files from each other over the LAN cable. To avoid more configuration, just Turn off password protected sharing. By doing so, you enable the other computer to access shared data without providing any credentials. This is not a good security practice by since you are sharing your data with people you trust, you can make this one-time exception. Once you are done with file sharing, make sure you Turn on password protected sharing. Once done, click Save Changes. Just as I said in the beginning, repeat the same steps for the other PC.

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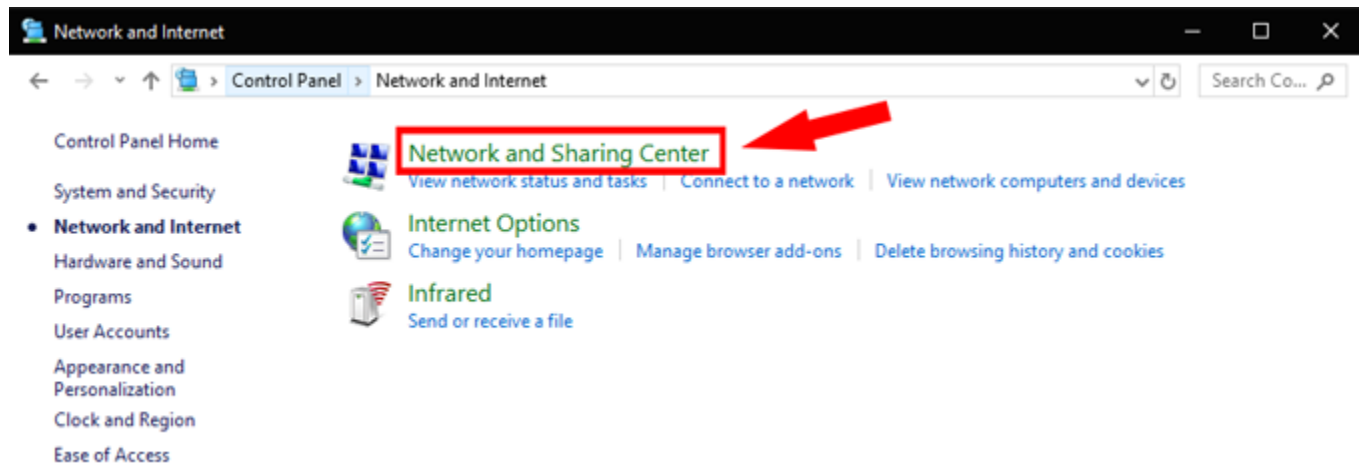


Step 3: Setup Static IP

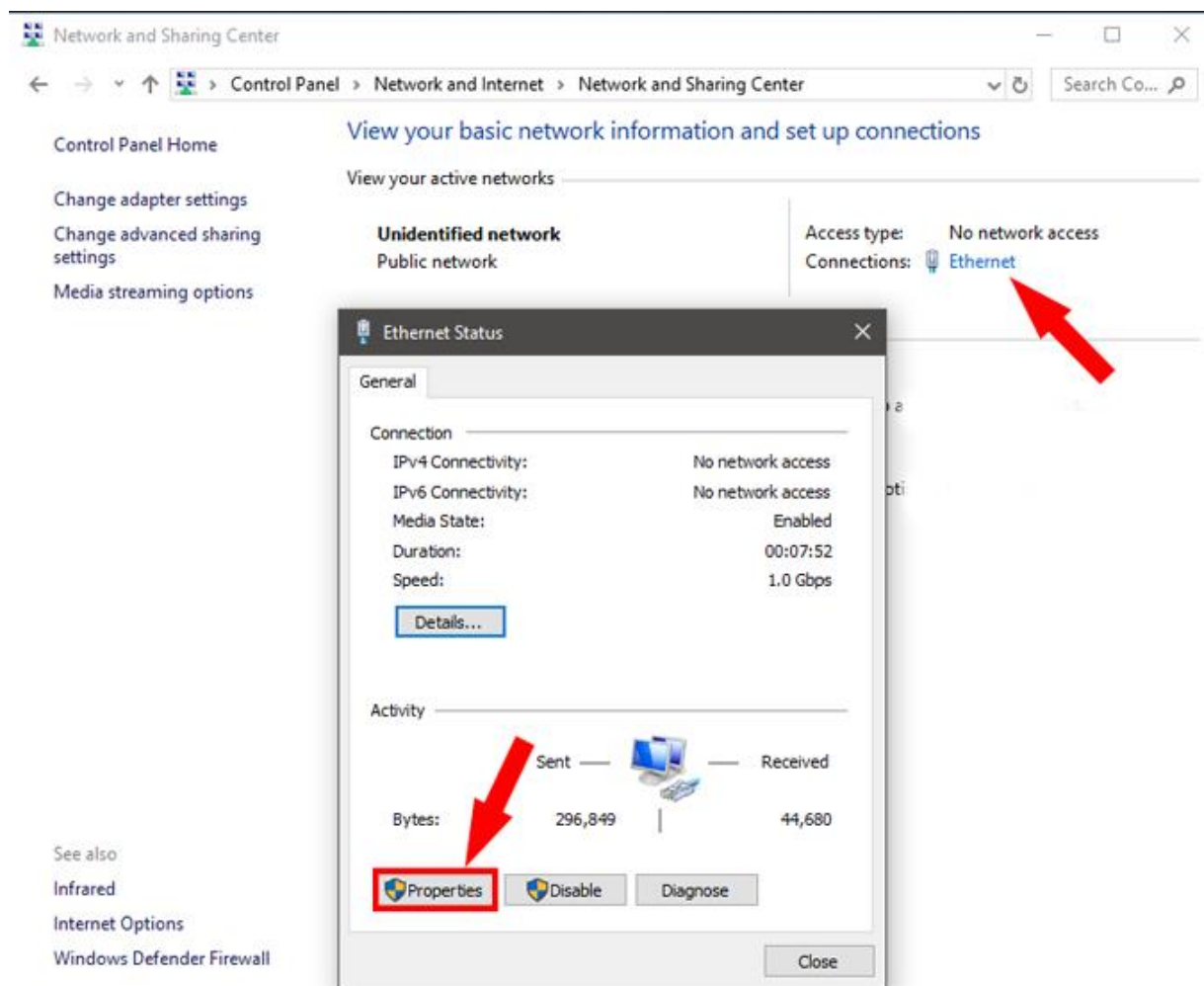
Now that you have enabled network sharing on both PCs, it's time to bring both the computers on to the same network. We will do this by setting a static IP address of the same class. Just like the previous step, you need to do this on both PCs. The following are the steps.

1. To set up a Static IP, open Control Panel, browse to Network and Internet and click on Network Sharing Center. Alternatively, you can also right-click on the Start Menu and select Network Connections.

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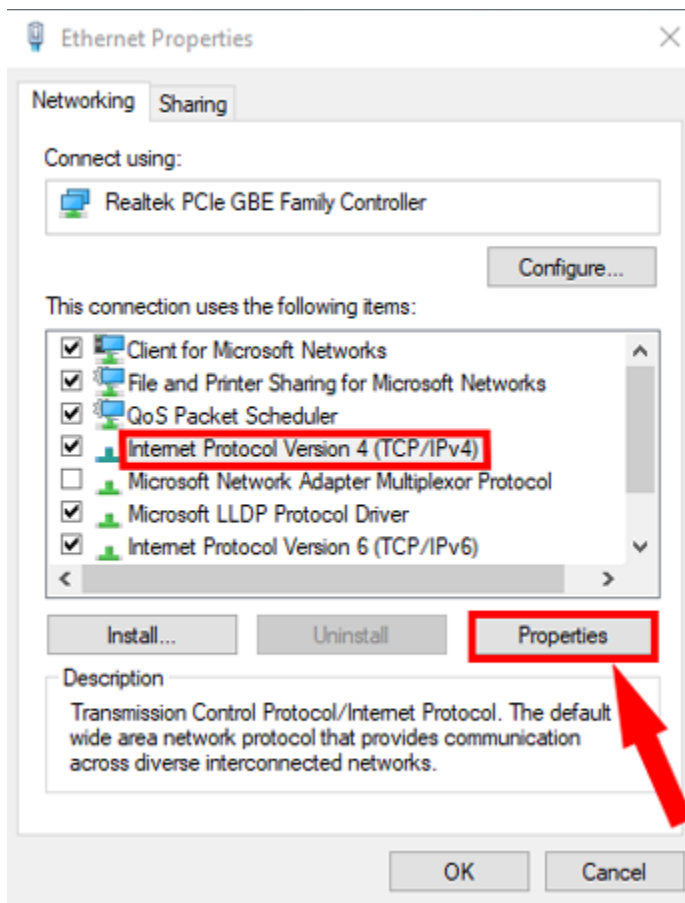


2. On the next window, you will see the active connections which should be Ethernet, since both PCs are connected with a physical LAN cable. Click on the Ethernet link. A new dialog box will open, here click on the Properties button.



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3. In the next pop-up, select “Internet Protocol Version 4 (TCP/IPv4)”. Now, click on Properties. This will open another dialogue box.



4. Here, you need to configure the two PCs with different IP settings.

On computer 1, select the option “Use the following IP address.” and, put the following values

IP Address: 192.168.10.10

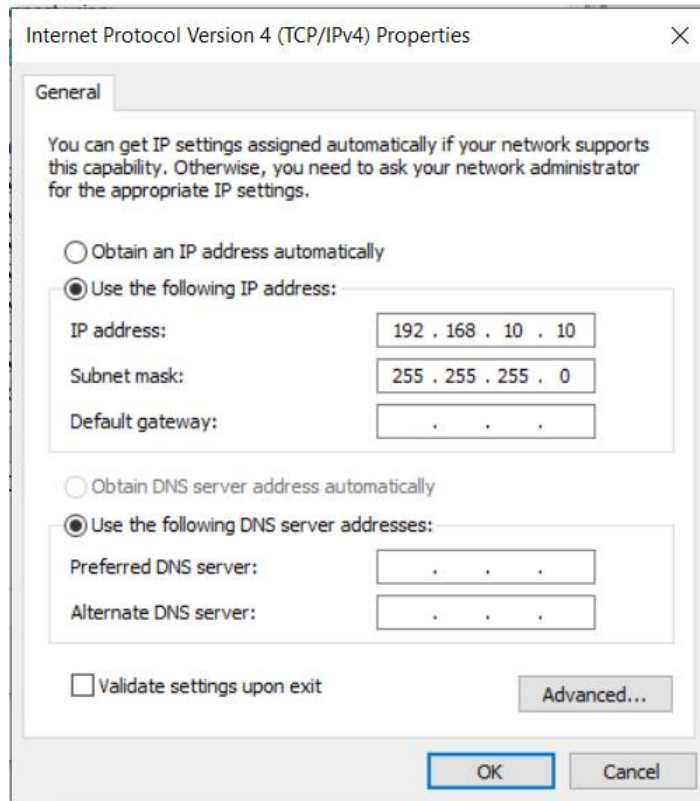
Subnet mask: 225.225.225.0

Default gateway: empty

Of course, it's not necessary you use these IP addresses. You can use any Class A or B IP address. In case you are not sure what this all means, better stick with this example.

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PC 1



On the second computer, do similar steps, but flip the IP address and Default gateway values

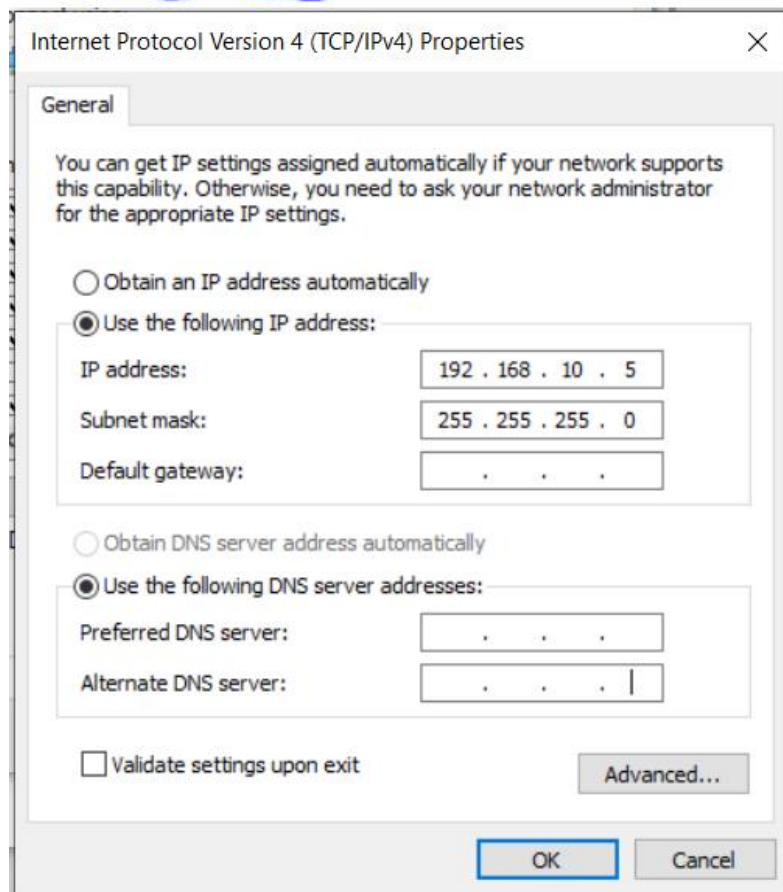
IP address: 192.168.10.5

Subnet mask: 225.225.225.0

Default gateway: empty

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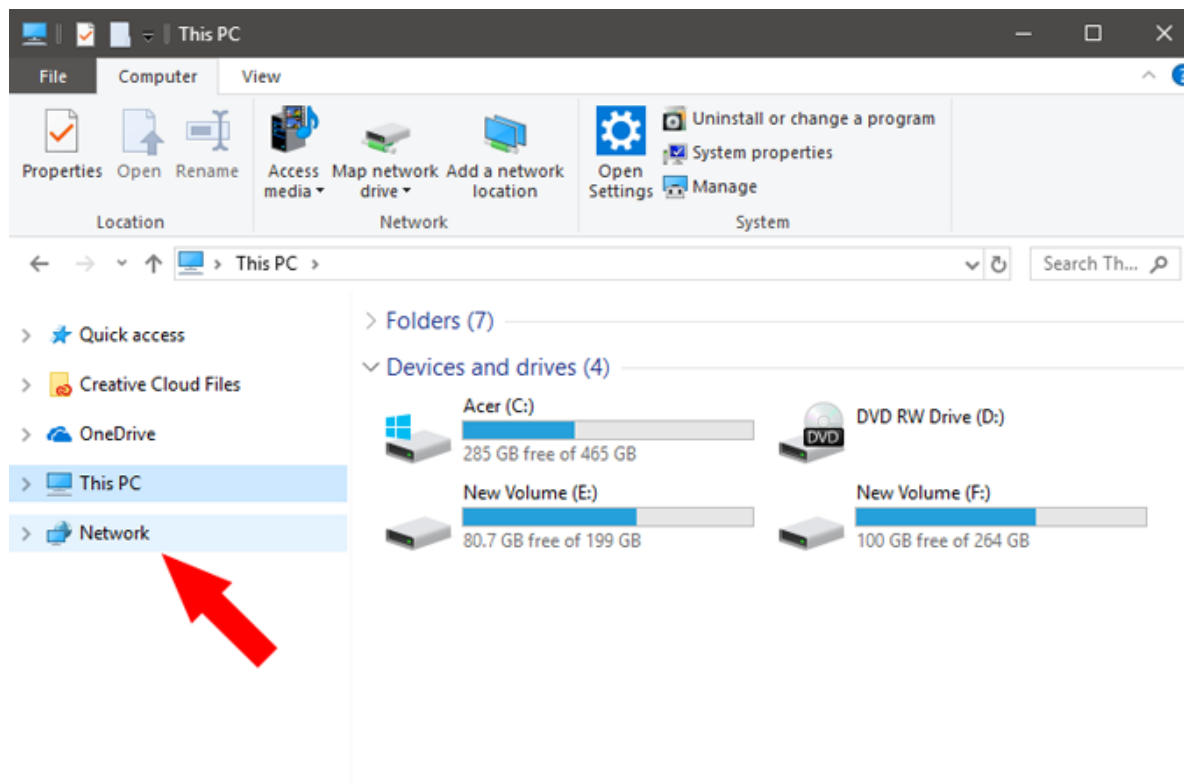
PC 2



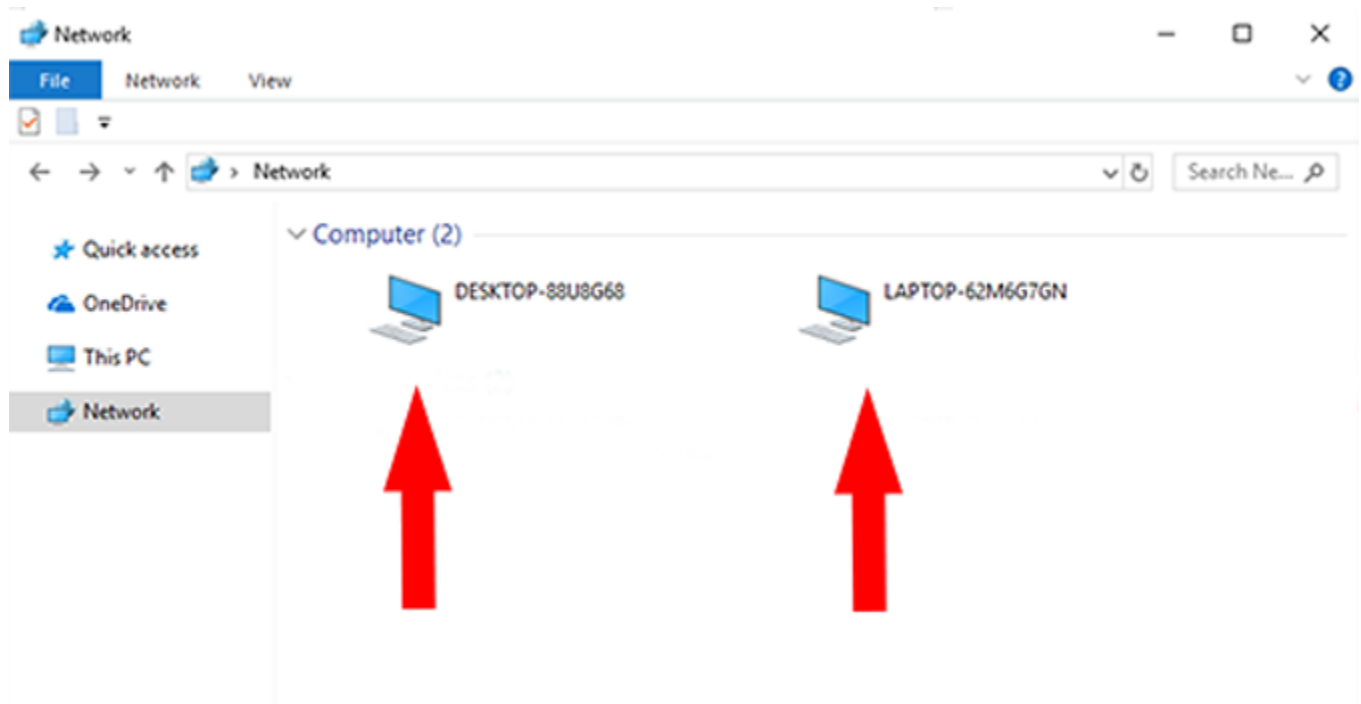
What we are doing is keeping the subnet mask the same and changing the IP address.

Next, open your Window's File Explorer and click on Network tab at the left side of the window.

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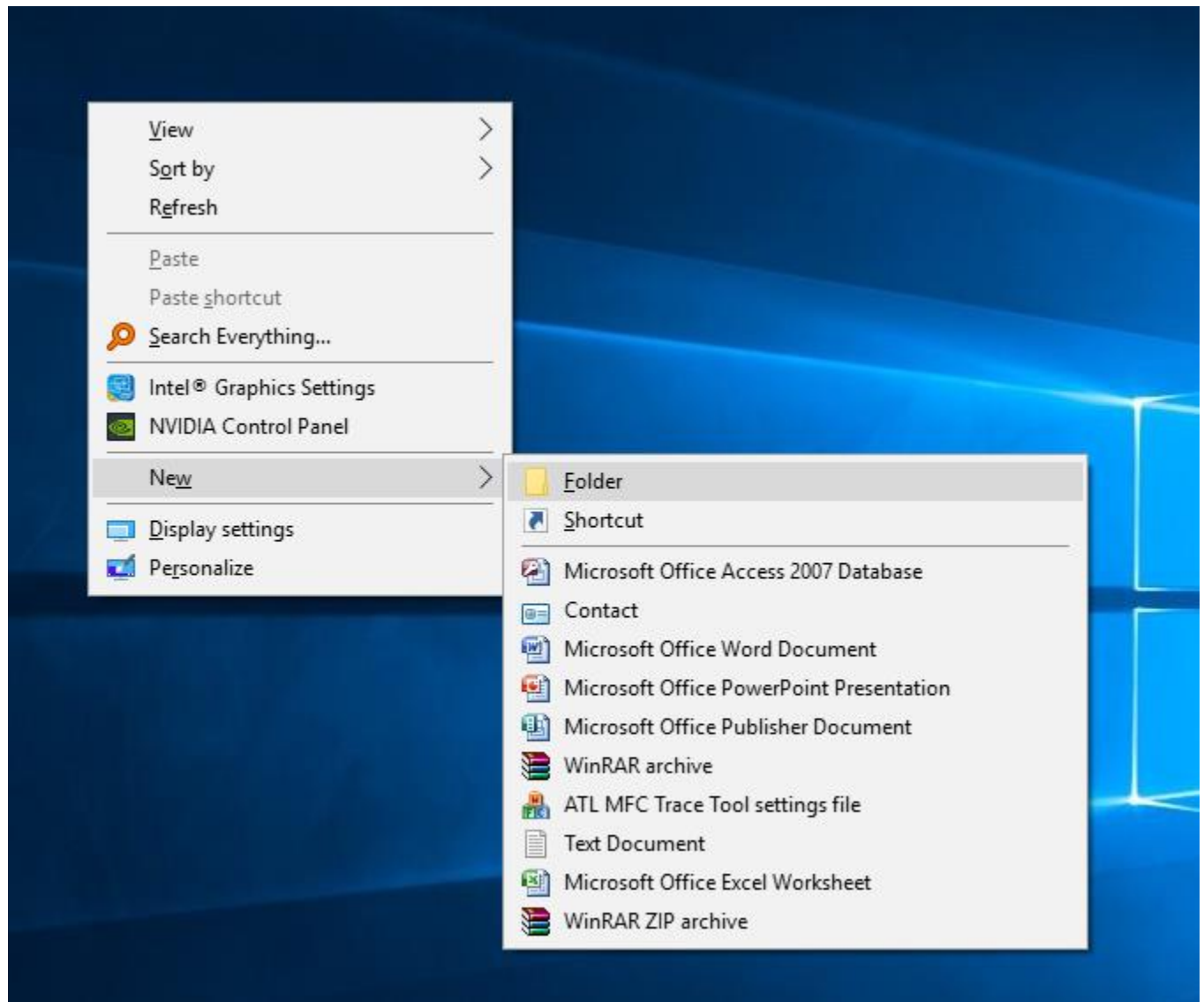


If you have set up everything right, both the PCs should appear in this Network window on both computers. Now, you can just click on the other PC's icon and browse the file. But wait, you still need to configure one last setting.



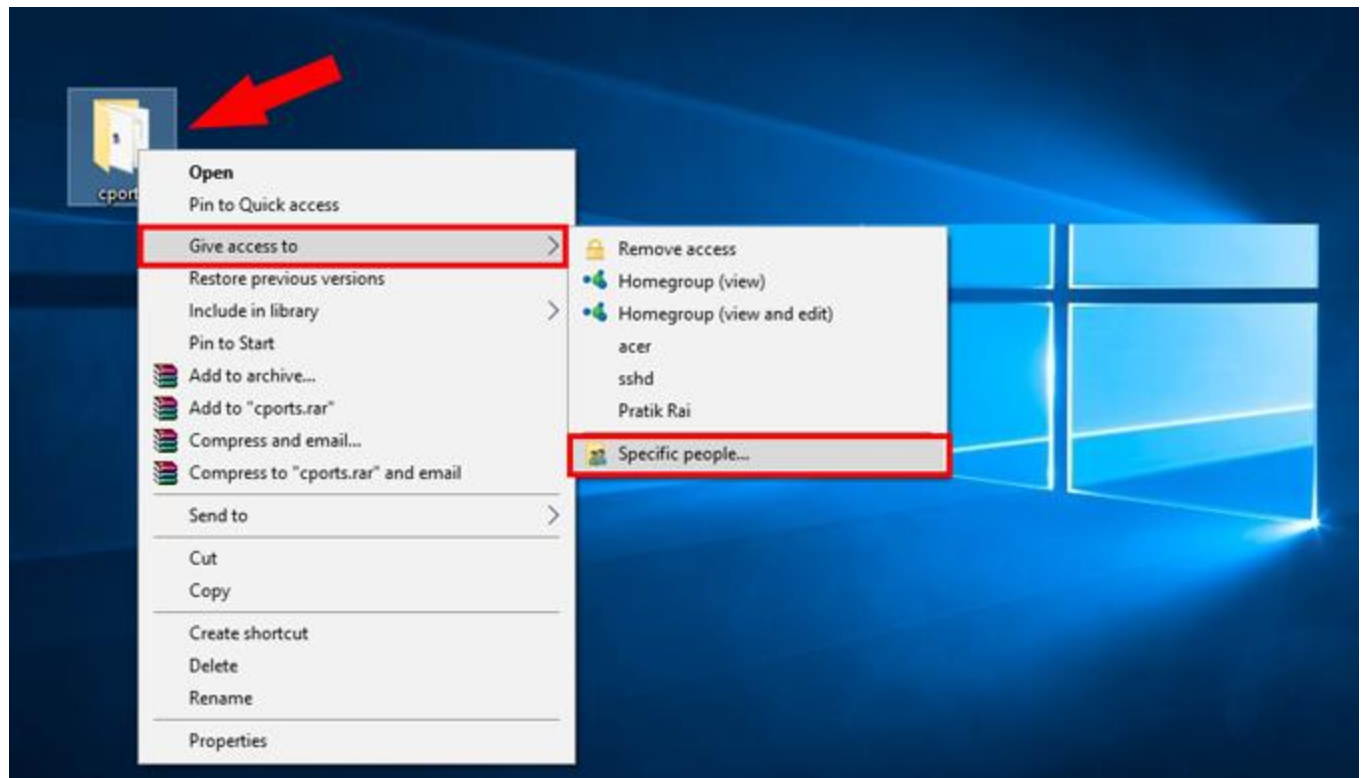
Step 4: Share a folder

Assuming that you have connected the cable properly, enabled the sharing options, and configured the IP addresses. Now, it is time to send files from one PC to another. For that, you first need to share the target folder on LAN. I'll recommend, you can create a new folder on your desktop, and copy paste all the files that you want to move to another computer in that folder.



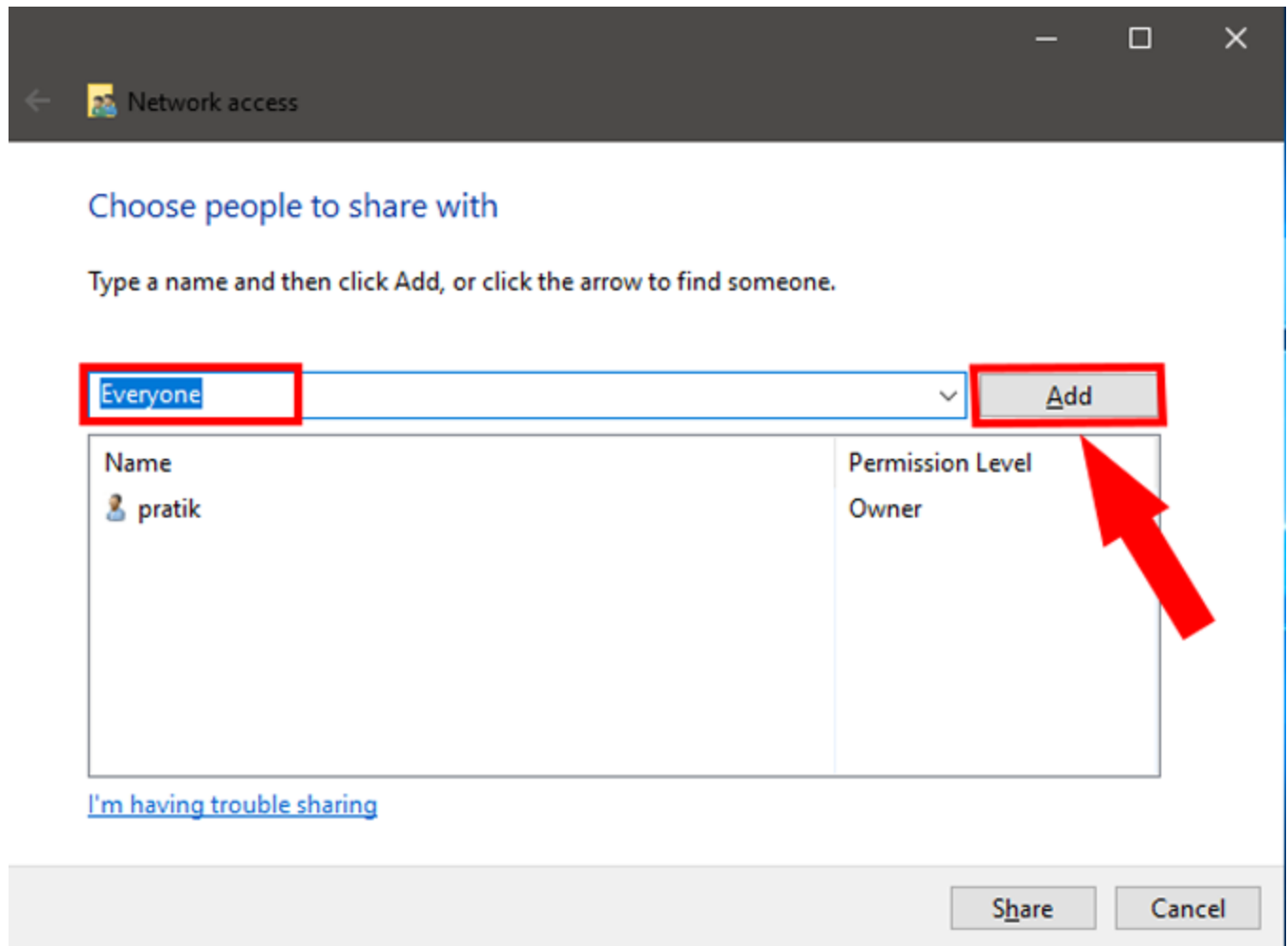
Next, select the folder you want to share and right-click on it. From the context menu, navigate to “Give access to” and select the option “Specific People.”

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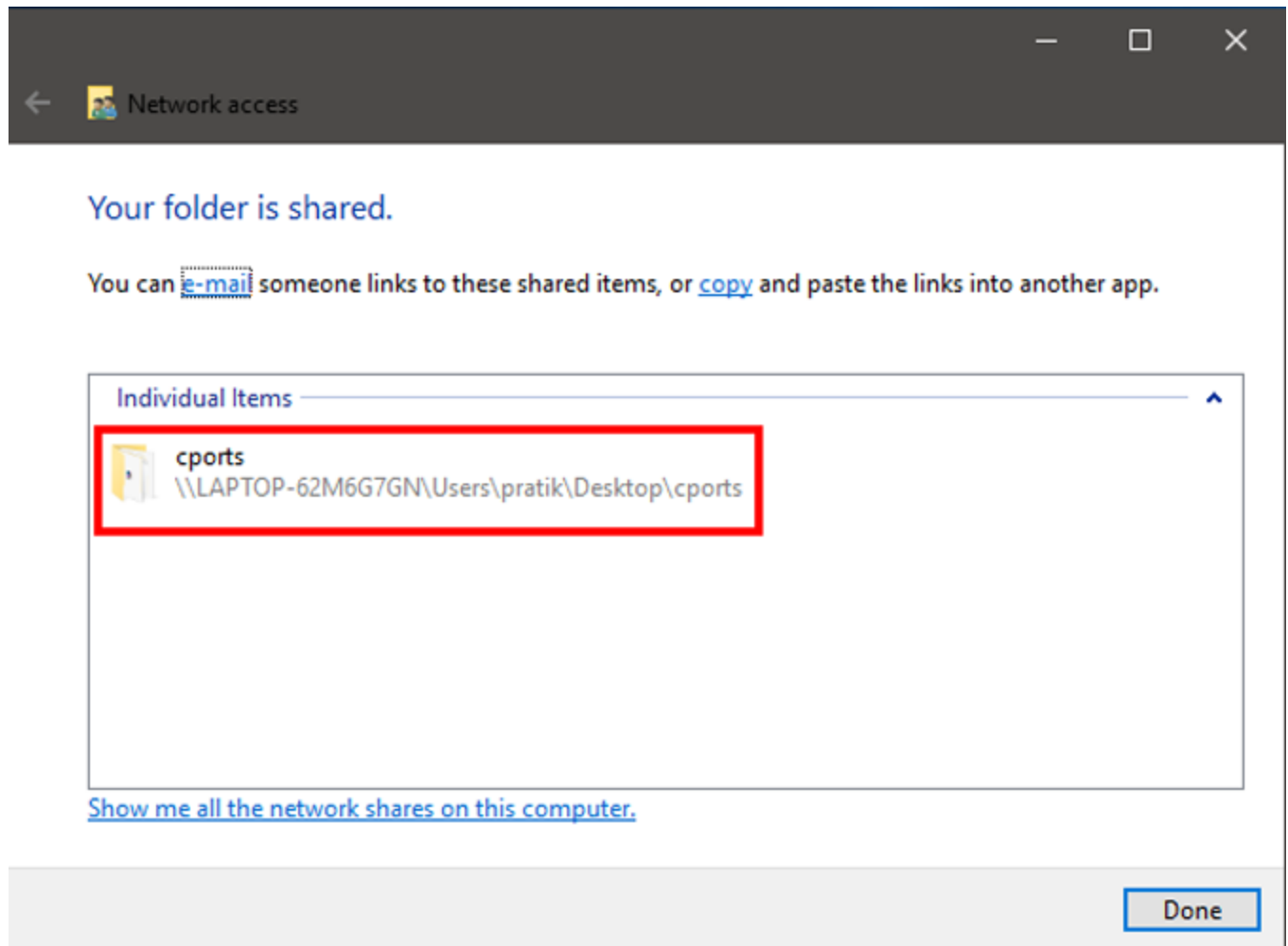
3. In the File Sharing window, choose Everyone from the drop-down menu. Click on the Add button next to it and finally hit the Share button.

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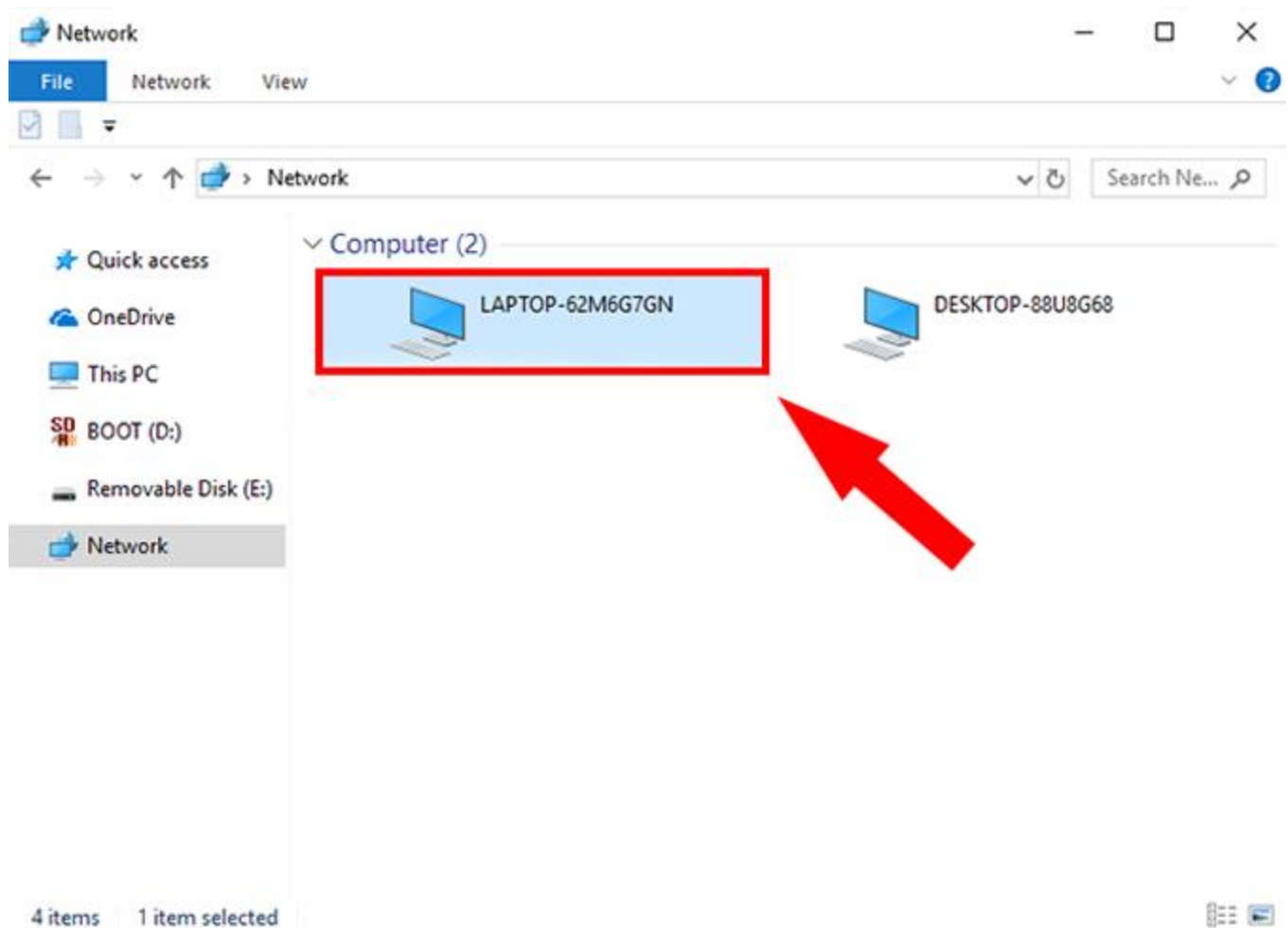
Once you have shared it, the next window will show you the network location of the folder.

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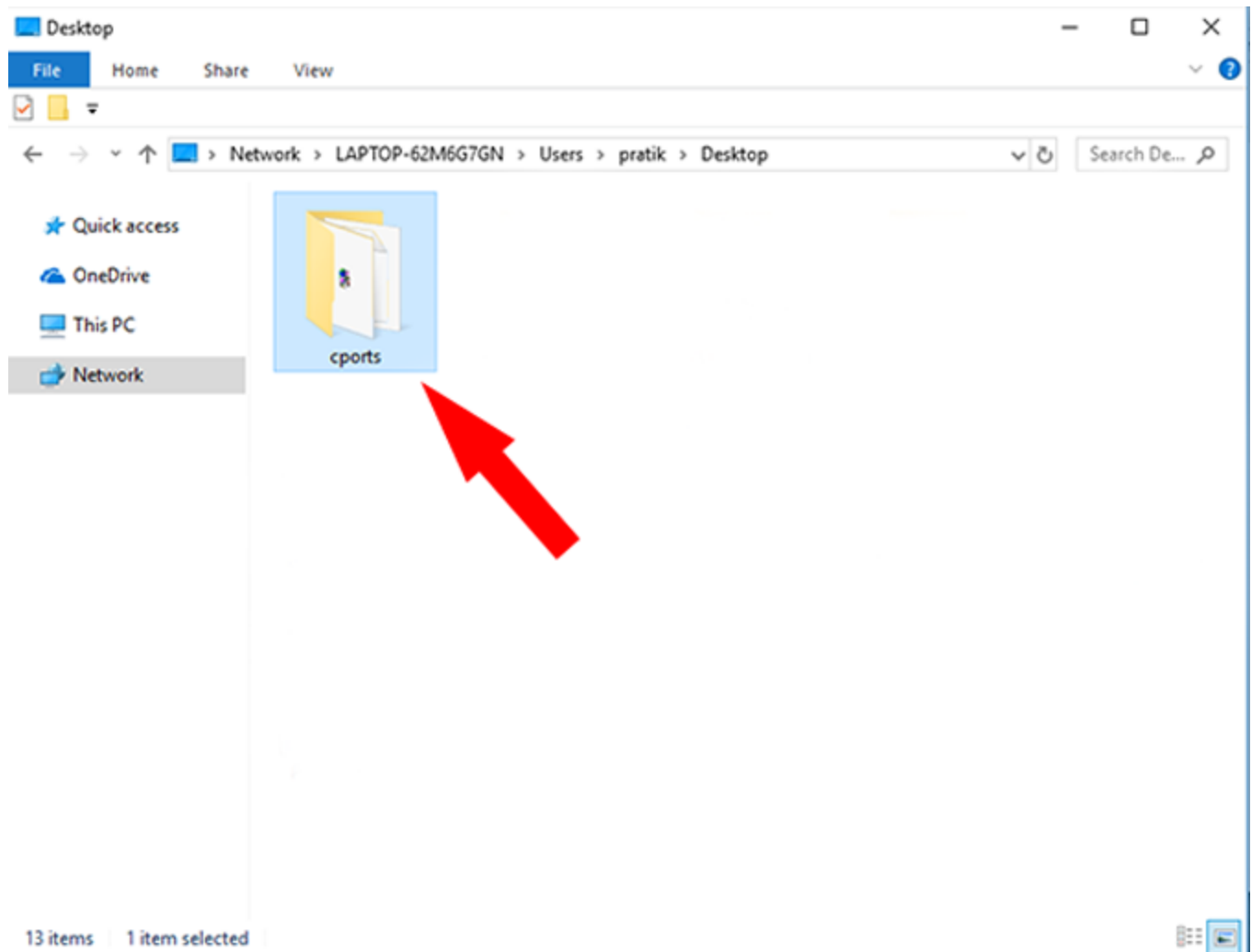
That's it. Just go back to the other PC from where you want to access the file, open the Networks panel and click on the other computer's name.

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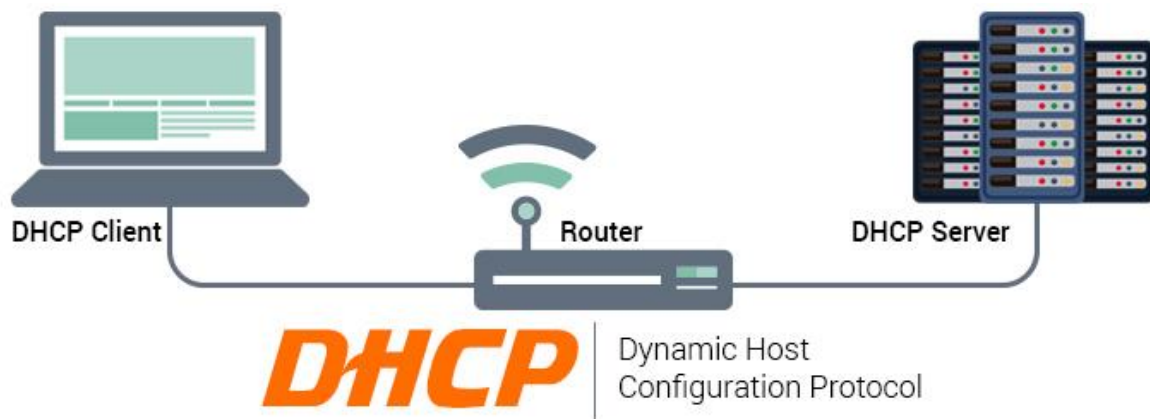
Here, you will see the folder you just shared. From there, just open the folder and transfer the files and folders as you normally do. i.e, by copy and paste. Similarly, you can repeat the same steps from the other computer.

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▪ DHCP

DHCP (**D**ynamic **H**ost **C**onfiguration **P**rotocol) Server allots the IP addresses to computers, while DNS server resolves them. You need DHCP Server if you do not want to manually maintain IP Addresses or you have less IP Addresses than number of machines you have, as dynamic DHCP Server will recycle IP Addresses on machines. DHCP Features support Static and Dynamic 125 DHCP Ranges, Range Filters, Relay Agents and BOOT, Options can be specified for DHCP Ranges, Global or for Static Hosts.



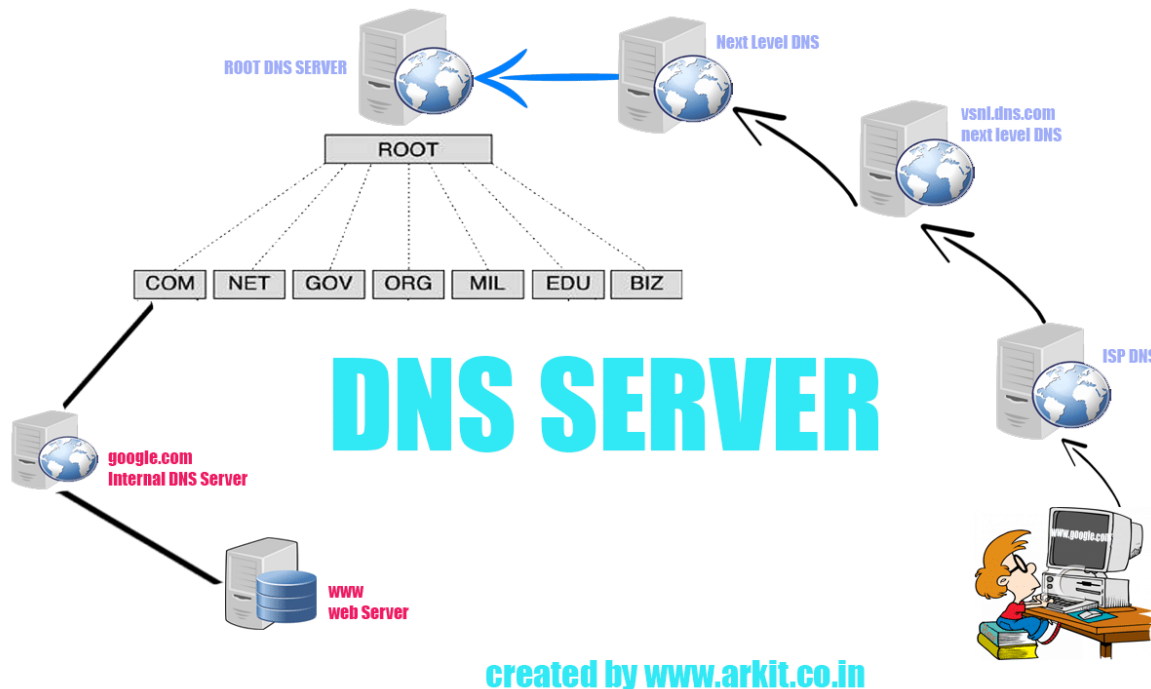
▪ Website Server.

The server where whole website is location

▪ DNS Server.

DNS Server is needed for resolving hostnames to their IP addresses. Normally your ISP will provide you with DNS Service. You may have your own DNS Server, which will resolve hostnames by forwarding them to ISP's DNS Server and cache the addresses also.

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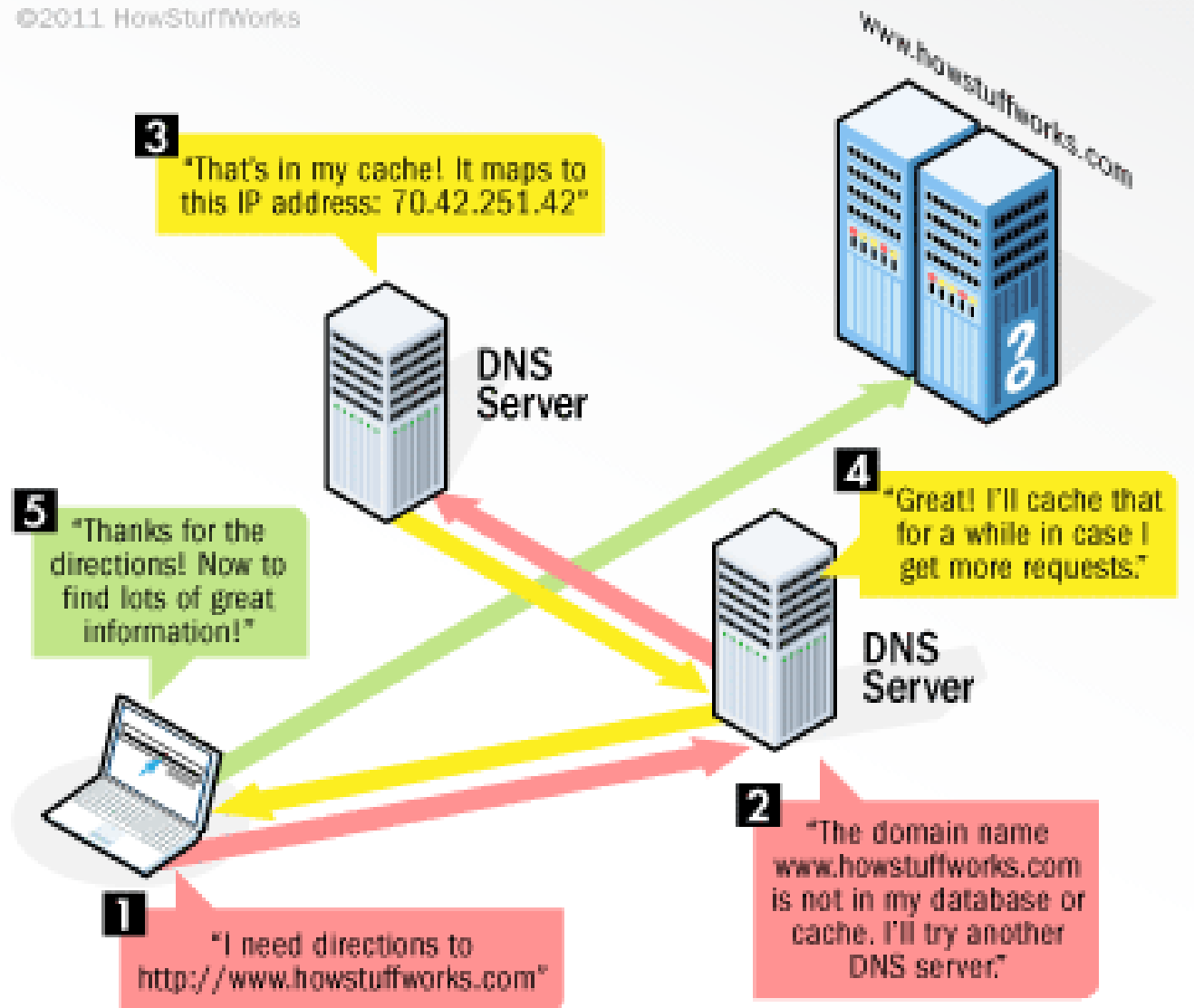
If you have home/small office network with Unix/Linux machines, these machines will not be resolved from each other, as Unix/Linux machines do not support NBNS protocol and you need your own DNS Server. But how about resolving your local machines ?. Your ISP's DNS Server will not have this list and your own DNS Server won't have them either. Most DNS Servers cannot do this.(unless you configure dynamic updates, or use static IP addresses and manually enter them).

This server resolves dhcp allotted local machines automatically in addition to external hosts, with the added advantage being both dhcp and dns server are always in sync. Also there is no need to create and maintain cumbersome zone files. Dual DHCP DNS Server is an Open Source Freeware. In addition, this server is designed for Load Sharing Replicated Operation

DNS Features include Forward and Reverse Lookup, Zone Transfer, Primary/Secondary Mode of Operation, MX Records, Wildcard Records, Conditional and Default forwarding.

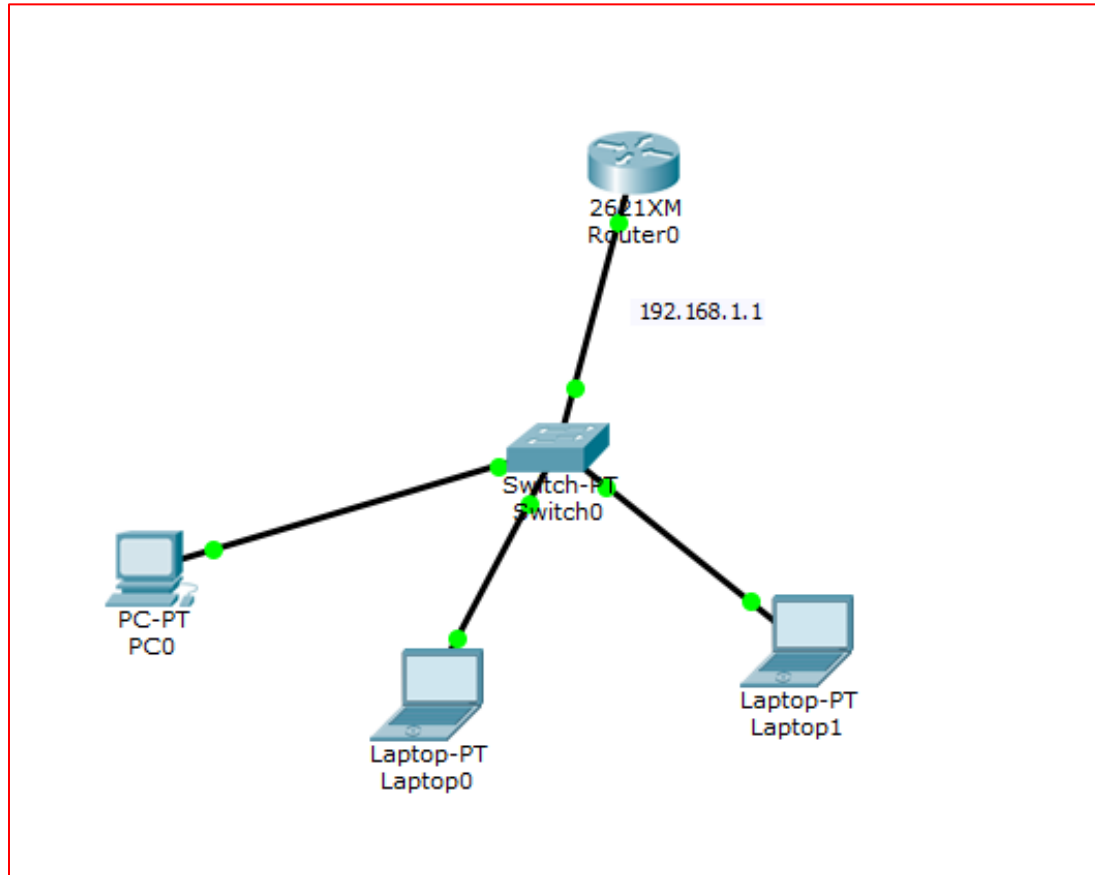
Either DHCP or DNS Service can be used. If both services are used, DHCP allotted hosts are automatically added in DNS zones.

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▪ -Configuring DHCP server on a Router

1. Build the network topology:



2. On the router, configure interface fa0/0 to act as the default gateway for our LAN.

1. Router>enable
2. Router#configure terminal
3. Enter configuration commands, one per line. End with CNTL/Z.
4. Router(config)#interface FastEthernet0/0
5. Router(config-if)#ip address 192.168.1.1 255.255.255.0
6. Router(config-if)#no shutdown

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
```

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3. Configure DHCP server on the Router. In the server we will define a DHCP pool of IP addresses to be assigned to hosts, a Default gateway for the LAN and a DNS Server.

- Router(config-if)#ex
- Router(config)#ip dhcp pool P1
- Router(dhcp-config)#network 192.168.1.1 255.255.255.0
- Router(dhcp-config)#default-router 192.168.1.1
- Router(dhcp-config)#dns-server 192.168.1.10
- Router(dhcp-config)#ex

```
Router(config-if)#ex
Router(config)#ip dhcp pool P1
Router(dhcp-config)#network 192.168.1.1 255.255.255.0
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#dns-server 192.168.1.10
Router(dhcp-config)#ex
```

We can add **ip dhcp excluded-address** command to our configuration so as to configure the router to exclude addresses **192.168.1.1** through **192.168.1.10** when assigning addresses to clients. The **ip dhcp excluded-address** command may be used to reserve addresses that are statically assigned to key hosts.

So add the above command under the **global configuration mode**.

- Router(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.10
4. Now go to every PC and on their IP configuration tabs, enable DHCP. Every PC should be able to obtain an IP address, default gateway and DNS server, as defined in step 2.

For example, to enable DHCP on PC1:

Click PC1->Desktop->IP configuration. Then enable DHCP:

Physical Config Desktop Custom Interface

IP Configuration X

IP Configuration

☒ DHCP ☐ Static

IP Address 192.168.1.13

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 192.168.1.10

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Do this for the other PCs.

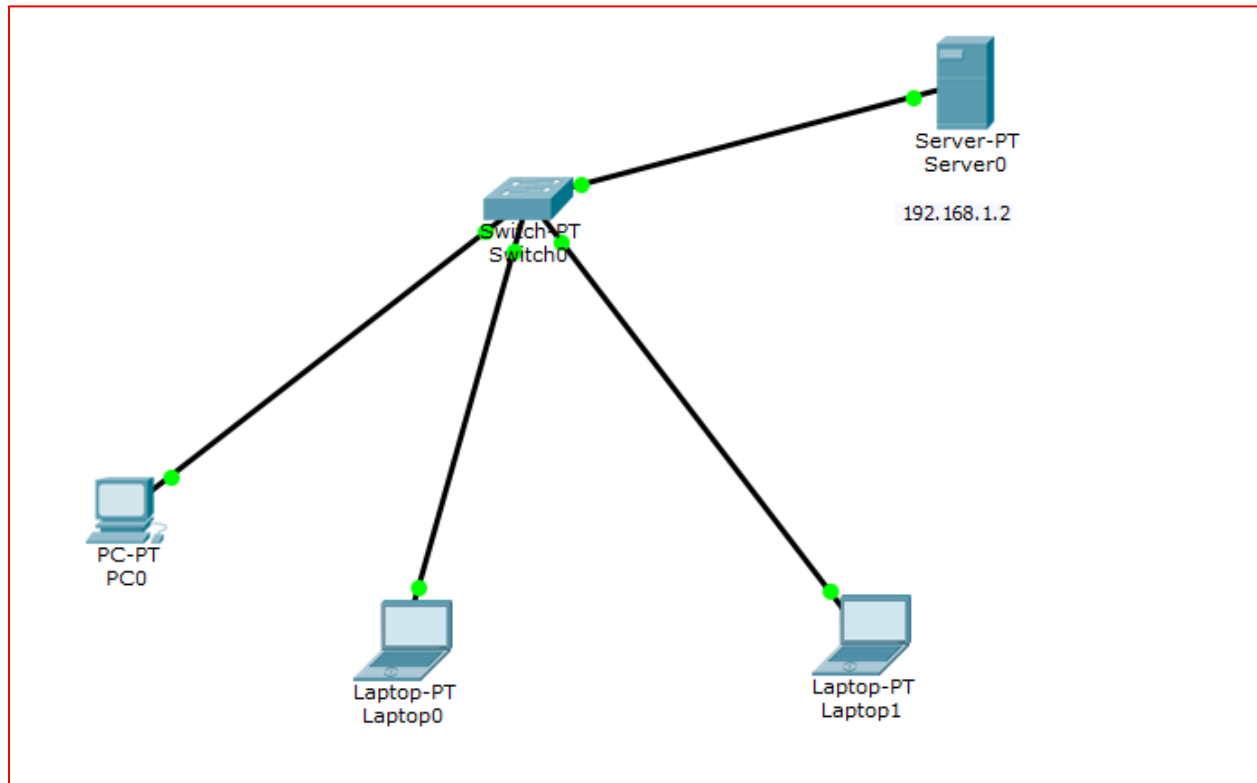
You can test the configuration by pinging PC2 from PC1. Ping should succeed.

It's that simple!

Now let's do the same thing using a Generic server in place of a router:

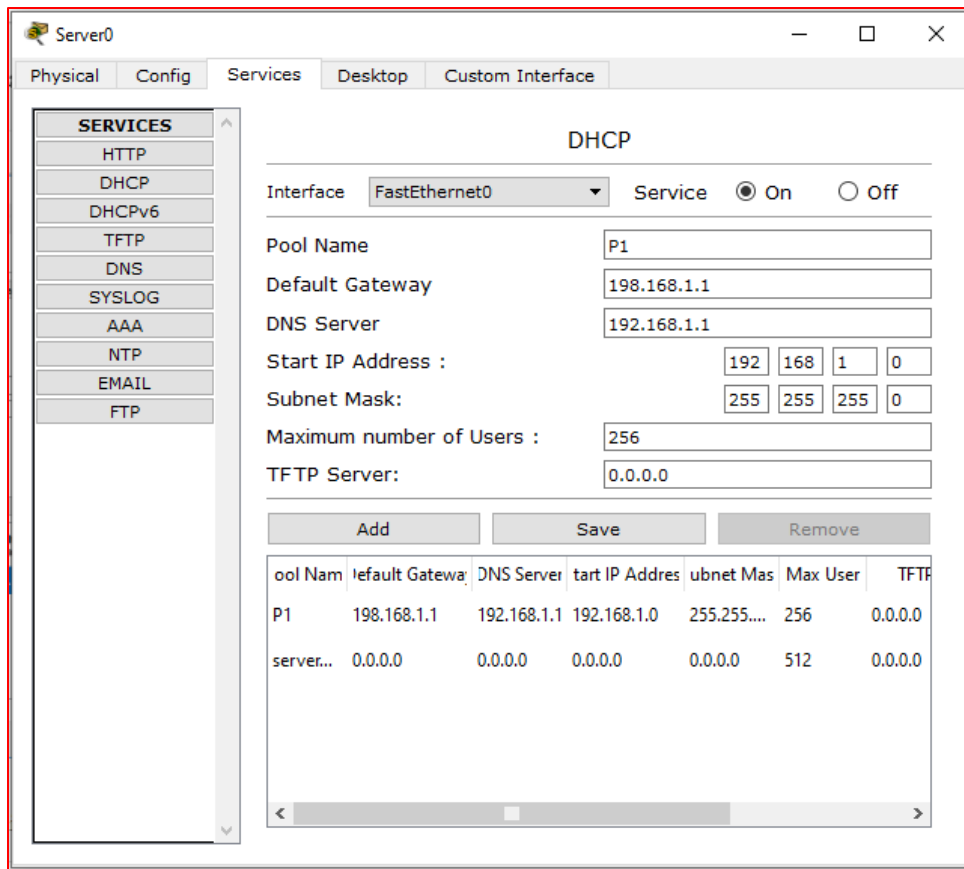
▪ **Configuring DHCP service on a generic server in Packet Tracer.**

1. Build the network topology:

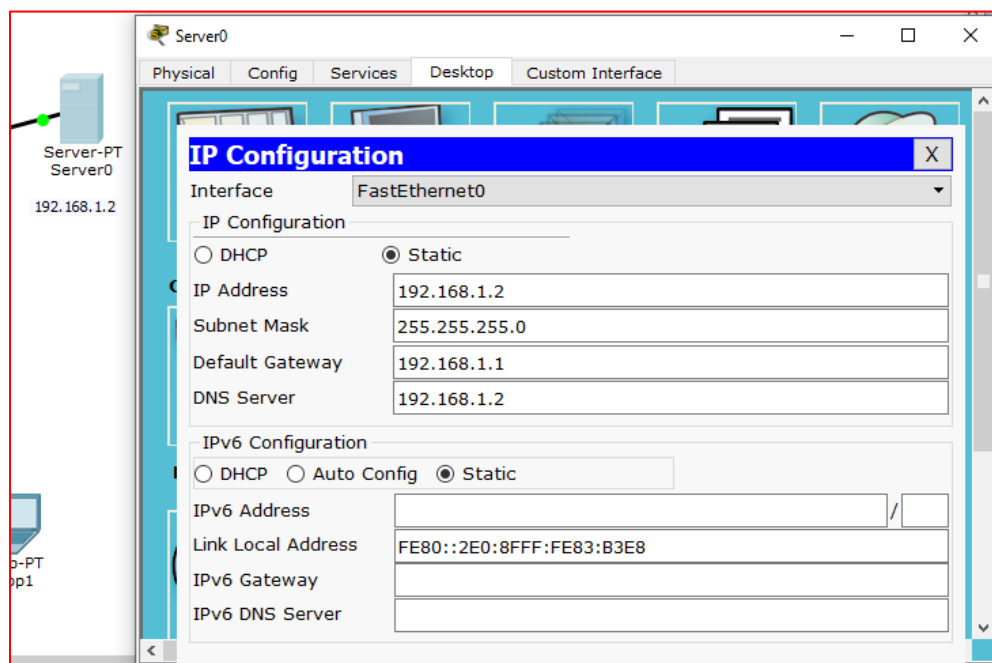


2. Configure static IP address on the server (192.168.1.2/24).
3. Now configure DHCP service on the generic server.
4. To do this, click on the server, then click on Services tab. You will pick DHCP on the menu. Then proceed to define the DHCP network parameters as follows:
 - ❖ Pool name: MY_LAN
 - ❖ Default Gateway: 192.168.1.1
 - ❖ DNS Server: 192.168.1.2
 - ❖ Start IP Address: 192.168.1.0
 - ❖ Subnet Mask: 255.255.255.0
 - ❖ Maximum Number of users: 256

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5. Assign the Ip Address to DHCP

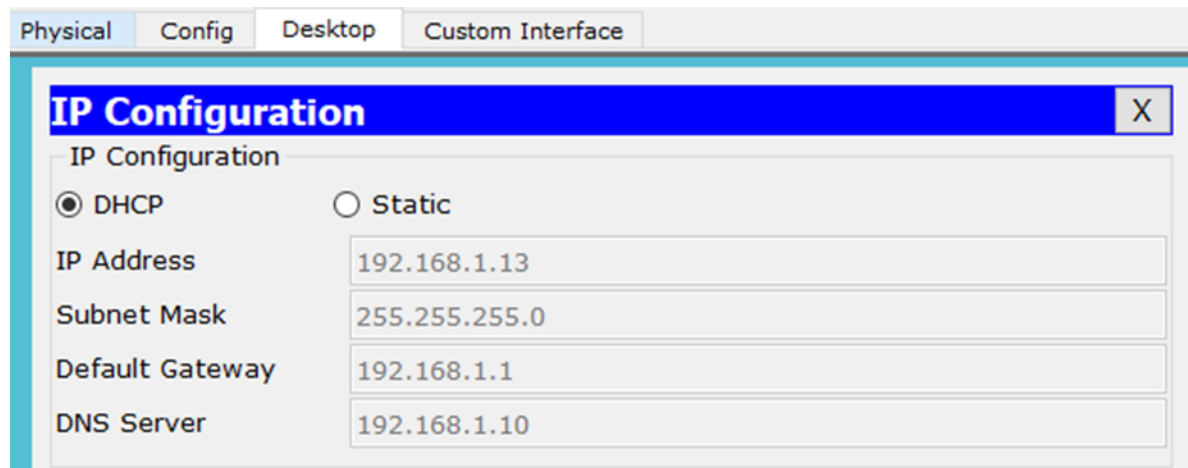


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- Now go to every PC and on their IP configuration tabs, enable DHCP. Every PC should be able to obtain an IP address, default gateway and DNS server, as defined in step 2.

For example, to enable DHCP on PC1:

Click PC1->Desktop->IP configuration. Then enable DHCP:



Physical Config Desktop Custom Interface

IP Configuration X

IP Configuration

☒ DHCP ☐ Static

IP Address 192.168.1.13

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 192.168.1.10

Do this for the other PCs.

You can test the configuration by pinging PC2 from PC1. Ping should succeed.

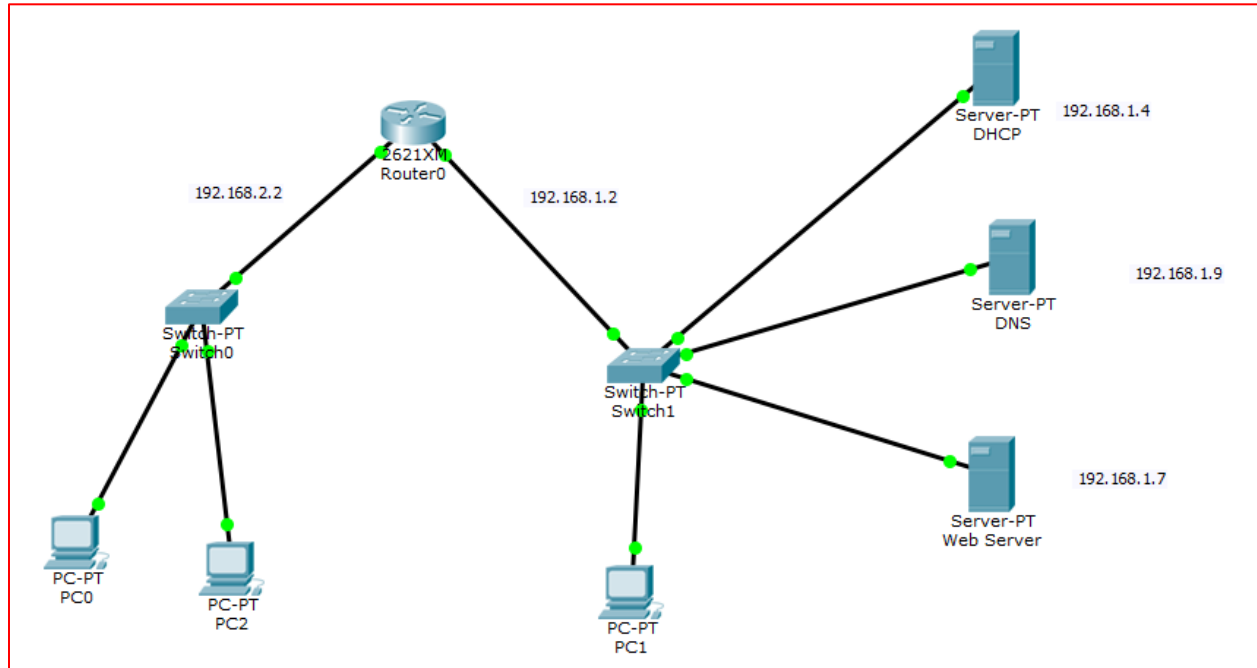
It's that simple!

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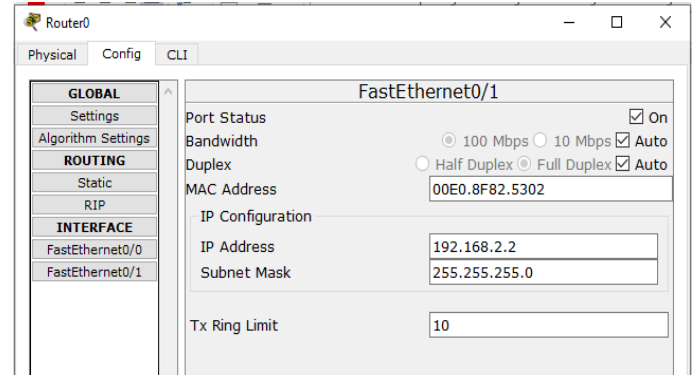
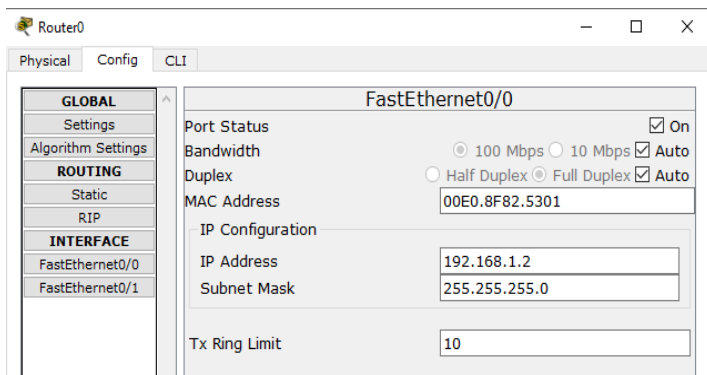
▪ Configuring DHCP, DNS and Web Server configuration in cisco packet tracer

1. Build the network topology:



2. On the router, configure interface fa0/0 to act as the default gateway for our LAN.

Assign Ip address to F0/0 and F0/1 of router.



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3. Apply follow commands in configuration mode on Router
 - ip dhcp pool P1
 - network 192.168.1.0 255.255.255.0
 - default-router 192.168.1.2
 - ip dhcp pool P2
 - network 192.168.2.0 255.255.255.0
 - default-router 192.168.2.2
4. Apply follows setting on DHCP IP Configurations

The screenshot shows a window titled "DHCP" with tabs for "Physical", "Config", "Services", "Desktop", and "Custom Interface". The "Config" tab is active, displaying the "IP Configuration" dialog for the "FastEthernet0" interface. The "IP Configuration" section has two radio buttons: "DHCP" and "Static", with "Static" selected. Below this, there are input fields for "IP Address" (192.168.1.4), "Subnet Mask" (255.255.255.0), "Default Gateway" (192.168.1.2), and "DNS Server" (192.168.1.9). The "IPv6 Configuration" section has three radio buttons: "DHCP", "Auto Config", and "Static", with "Static" selected. Below this, there are input fields for "IPv6 Address" (empty), "Link Local Address" (FE80::2D0:97FF:FE58:CC02), "IPv6 Gateway" (empty), and "IPv6 DNS Server" (empty).

IP Configuration		
Interface	FastEthernet0	
IP Configuration		
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static	
IP Address	192.168.1.4	
Subnet Mask	255.255.255.0	
Default Gateway	192.168.1.2	
DNS Server	192.168.1.9	
IPv6 Configuration		
<input type="radio"/> DHCP	<input type="radio"/> Auto Config	<input checked="" type="radio"/> Static
IPv6 Address		
Link Local Address	FE80::2D0:97FF:FE58:CC02	
IPv6 Gateway		
IPv6 DNS Server		

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5. Enable DHCP Services and Add Pool P1 and Pool P2 with respective Ip Address

Physical Config Services Desktop Custom Interface

SERVICES

- HTTP
- DHCP ✓
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: P2

Default Gateway: 192.168.2.2

DNS Server: 192.168.1.9

Start IP Address: 192.168.1.0

Subnet Mask: 255.255.255.0

Maximum number of Users: 256

TFTP Server: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server
P2	192.168.2.2	192.168.1.9	192.168.1.0	255.255.255.0	256	0.0.0.0
P1	192.168.1.2	192.168.1.9	192.168.1.0	255.255.255.0	256	0.0.0.0
serverPool	192.168.1.2	192.168.1.9	192.168.1.0	255.255.255.0	256	0.0.0.0

6. Apply follows setting on DNS IP Configurations

Physical Config Services Desktop Custom Interface

IP Configuration

Interface: FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address: 192.168.1.9

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.2

DNS Server: 192.168.1.9

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address: /

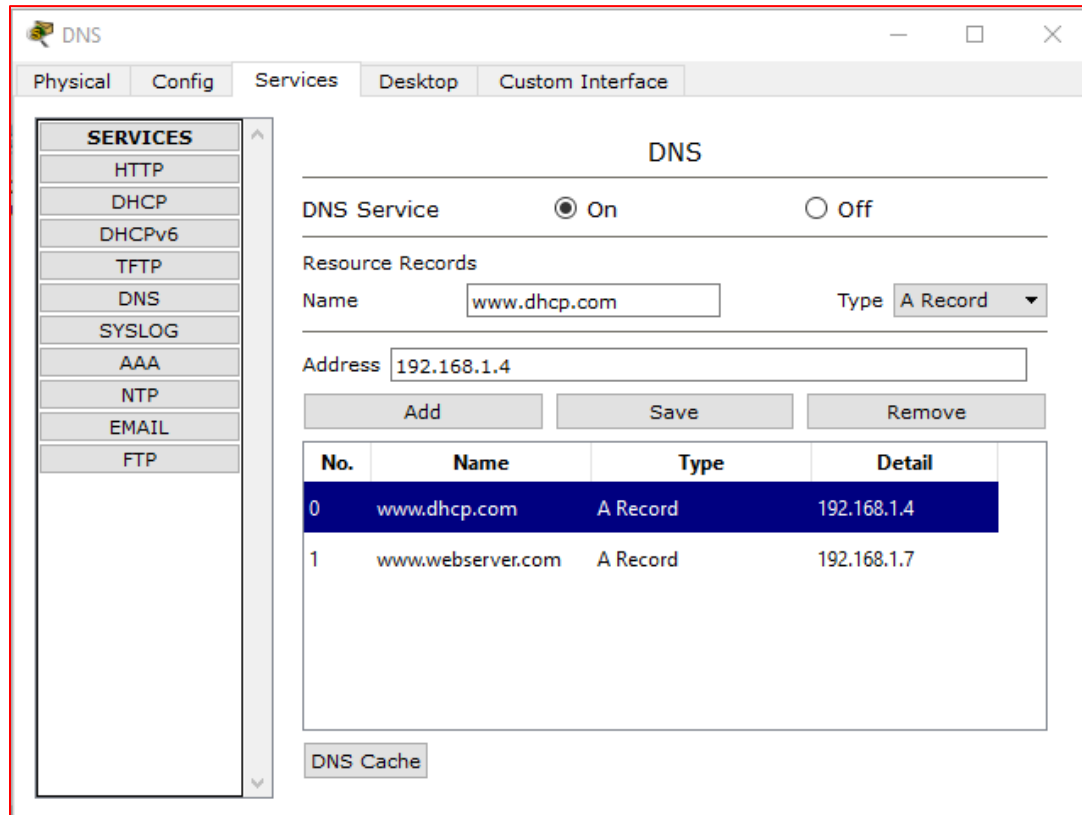
Link Local Address: FE80::20B:BEFF:FE9A:B827

IPv6 Gateway:

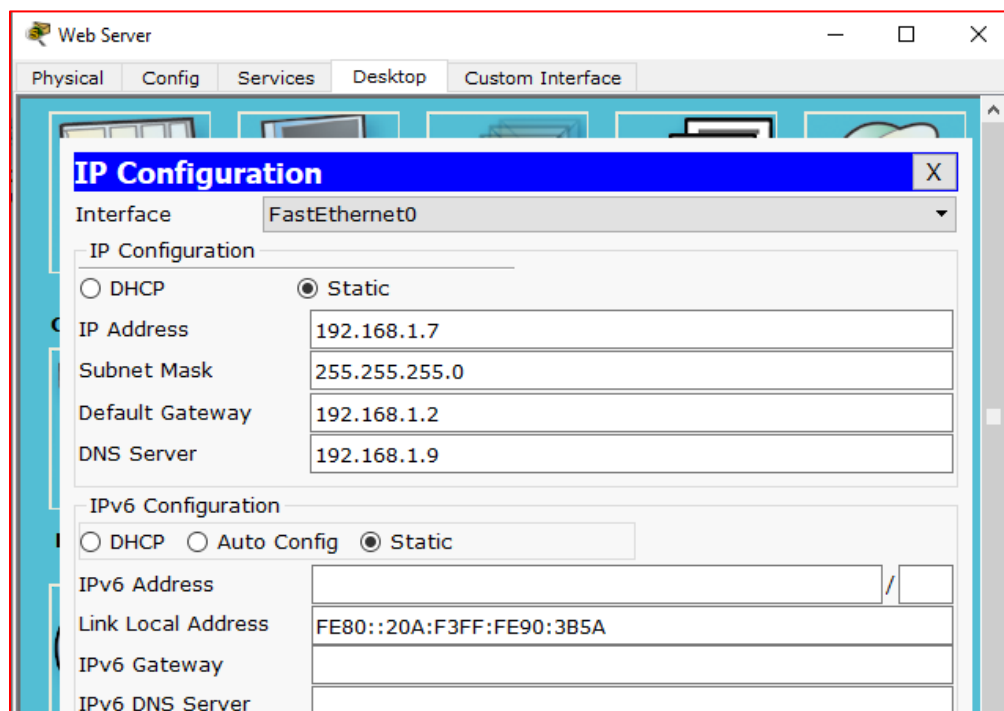
IPv6 DNS Server:

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7. Enable DNS Services of DNS and add two resources records

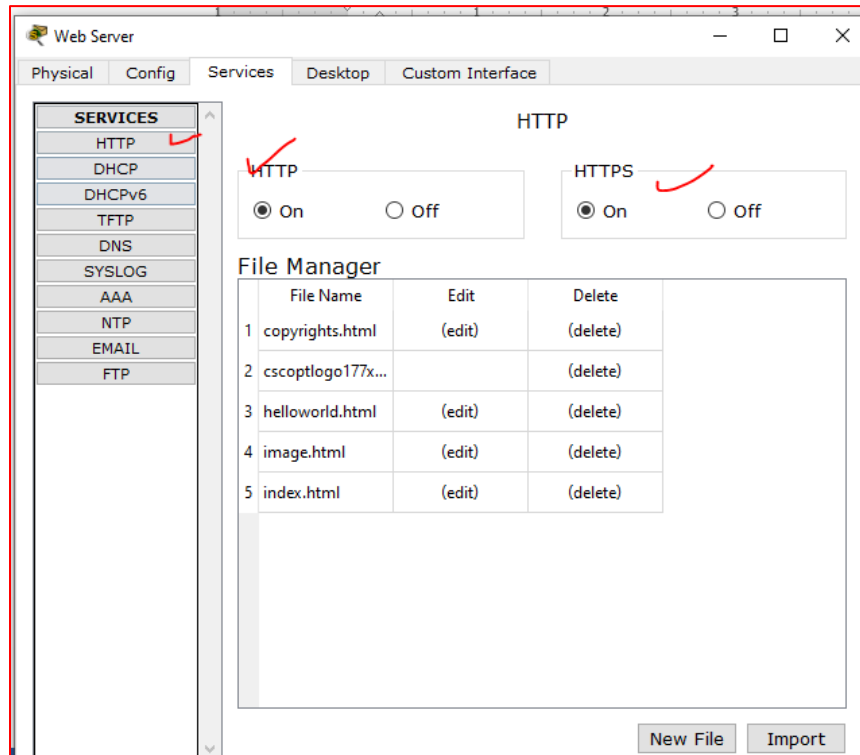


8. Apply follows setting on Web Server

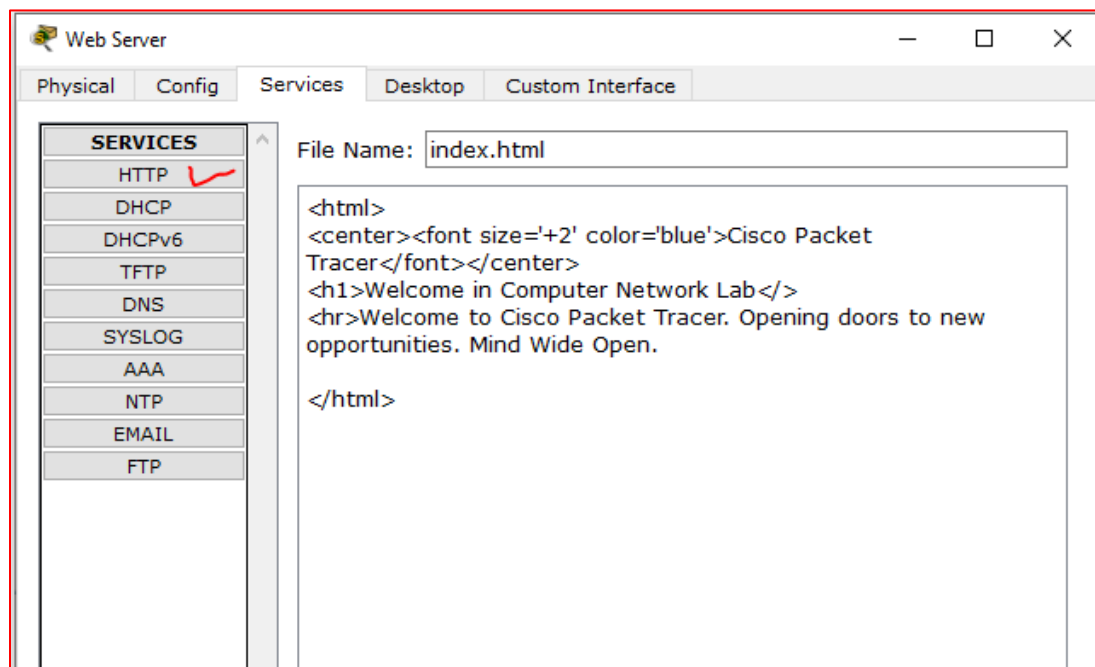


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9. Enable Http and Https in Web Server



10. Edith the Index .html and update it

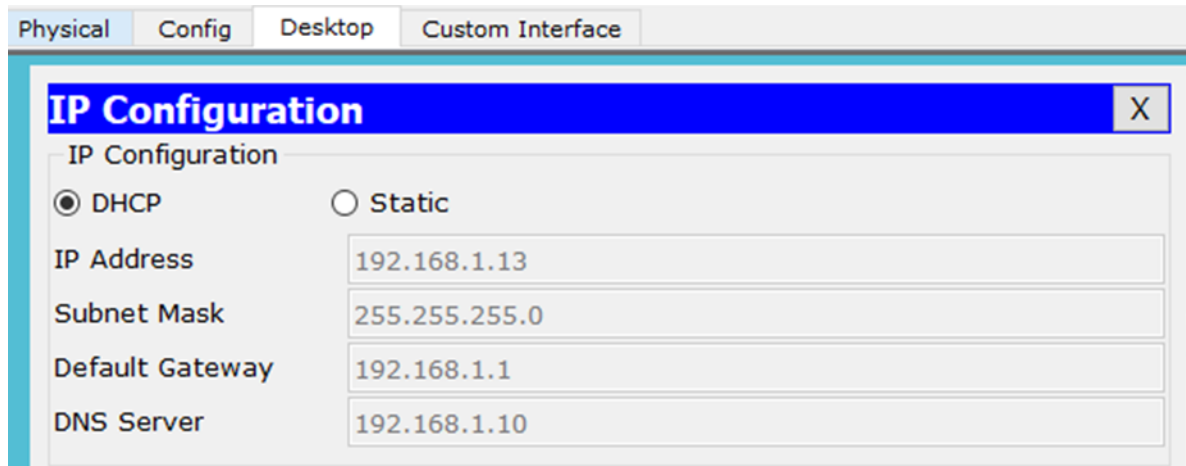


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11. Now go to every PC and on their IP configuration tabs, enable DHCP. Every PC should be able to obtain an IP address, default gateway and DNS server, as defined in step 2.

For example, to enable DHCP on PC1:

Click PC1->Desktop->IP configuration. Then enable DHCP:



Do this for the other PCs.

You can test the configuration by pinging PC2 from PC1. Ping should succeed.

It's that simple!