

EXP-7: Experiment with configuration of Host IP, Subnet Mask and Default Gateway of a device in LAN and establish Peer to Peer network connection.

I. Aim:

To configure a Host IP, Subnet Mask and Default Gateway of a device in LAN.

To establish Peer to Peer network connection using Switch and Router in a LAN.

II. Components and Tools:

System: Desktop Computer/Laptop

Operating system: Windows/Linux

Tool: Packet Tracer

III. Description:

IV. Diagrams / Experimental set-up:

V. Procedure:

VI. Output Description/Analysis:

VII. Viva-Voce Questions:

III. Description:

Classification of IP address

Class	Address Range	Supports
Class A	1.0.0.1 to 126.255.255.254	Supports 16 million hosts on each of 127 networks.
Class B	128.1.0.1 to 191.255.255.254	Supports 65,000 hosts on each of 16,000 networks.
Class C	192.0.1.1 to 223.255.254.254	Supports 254 hosts on each of 2 million networks.
Class D	224.0.0.0 to 239.255.255.255	Reserved for multicast groups.
Class E	240.0.0.0 to 254.255.255.254	Reserved.

Sub netting Why we Develop sub netting and How to calculate subnet mask and how to identify subnet address.

Default subnet masks:

- Class A: 255.0.0.0
- Class B: 255.255.0.0
- Class C: 255.255.255.0

Super netting Why we develop super netting and How to calculate supernet mask and how to identify supernet address.

Task-1: Configure Host IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration).

Procedure

1. Click on the Start button and select Control Panel then Network and Internet Connections.
2. Click Network and Internet Connections.
3. Right click on the Local Area Connection icon and select Properties.
4. Select Internet Protocol (TCP/IP).
5. Click on the Properties button.
6. Uncheck that Obtain an IP address automatically and Obtain DNS server address automatically and put IP, Subnet mask & Default Gateways. (**write your IP**)
IP Address: 172.50.30.62
Subnet mask: 255.255.224.0
Default gateway: 172.50.5.203
Preferred DNS server: 172.50.5.203
7. Click on the Advanced button and select the DNS tab in the Advanced TCP/IP Settings window.
8. Ensure that Register this connection's addresses in DNS is not selected.
9. Click OK, OK, then Close to close all boxes.

Task: 2 Establish a simple LAN using Switch.

1. Creating a New Packet Tracer Project

Launch Packet Tracer:

Open the Packet Tracer application on your computer.

Create a New Project:

Click on “File” and then select “New” to start a new Packet Tracer project.

2. Designing the LAN Topology

In this example, we'll configure a simple LAN consisting of two computers connected to a switch. Follow these steps to design the topology:

Add Devices:

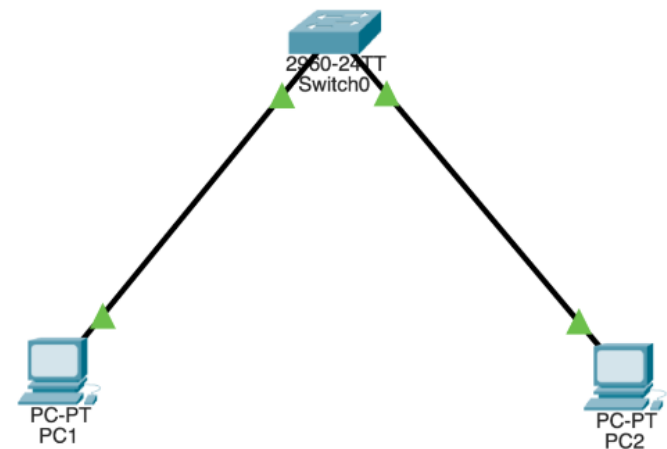
From the left panel, drag and drop devices onto the workspace. For our basic LAN, use PCs as end devices and a switch to connect them.

Connect Devices:

Use copper straight-through cables to connect the PCs to the switch. Click on the “Connections” button on the left panel, select the copper straight-through cable, and connect the devices by clicking on the desired interfaces on the switch and PCs.

Arrange Devices:

Organize the devices on the workspace for a clear and logical layout. This step is optional but can enhance the visual representation of your network.



Click on a PC to select it, then click on the "Config" tab at the bottom. Assign IP addresses to the PCs manually.
PC1: IP - 192.168.1.2
PC2: IP - 192.168.1.3
Set the subnet mask (e.g., 255.255.255.0).

3. Configuring IP Addresses on PCs

For devices in a LAN to communicate, each device must have a unique IP address within the same subnet. Follow these steps to configure IP addresses on the PCs:

Select a PC:

Click on one of the PCs to select it.

Access Configuration Tab:

Click on the “Config” tab at the bottom of the screen to access the configuration options for the selected PC.

Assign IP Address:

Manually assign an IP address to the PC 1. For example:

PC1: IP – 192.168.1.2

Set the subnet mask, such as 255.255.255.0.

Repeat for Other PCs:

Repeat the process for the other PCs, ensuring that each PC has a unique IP address within the same subnet.

PC2: IP – 192.168.1.3

Set the subnet mask, such as 255.255.255.0.

4. Testing Connectivity

Once the configuration is complete, it's essential to test connectivity to ensure that devices within the LAN can communicate effectively. Follow these steps to test connectivity:

Open Command Prompt:

Open the command prompt on one of the PCs.

Ping Another PC:

Use the “ping” command to test connectivity to another PC.

For example: **ping 192.168.1.3**

This command sends a series of packets to the specified IP address and checks for a response, verifying that the devices can communicate within the LAN.

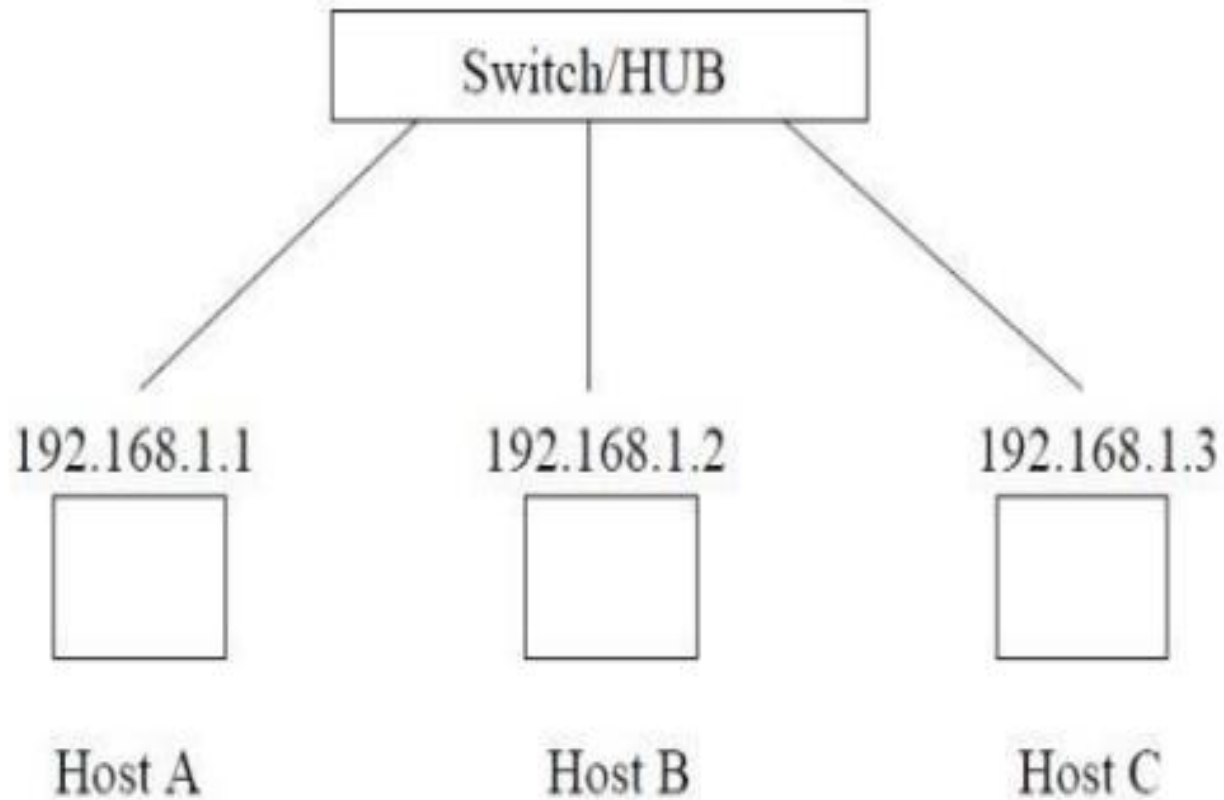
5. Saving the Packet Tracer Project

After completing the configuration and testing, it's crucial to save your Packet Tracer project to preserve your work. Follow these steps to save your project:

Save the Project:

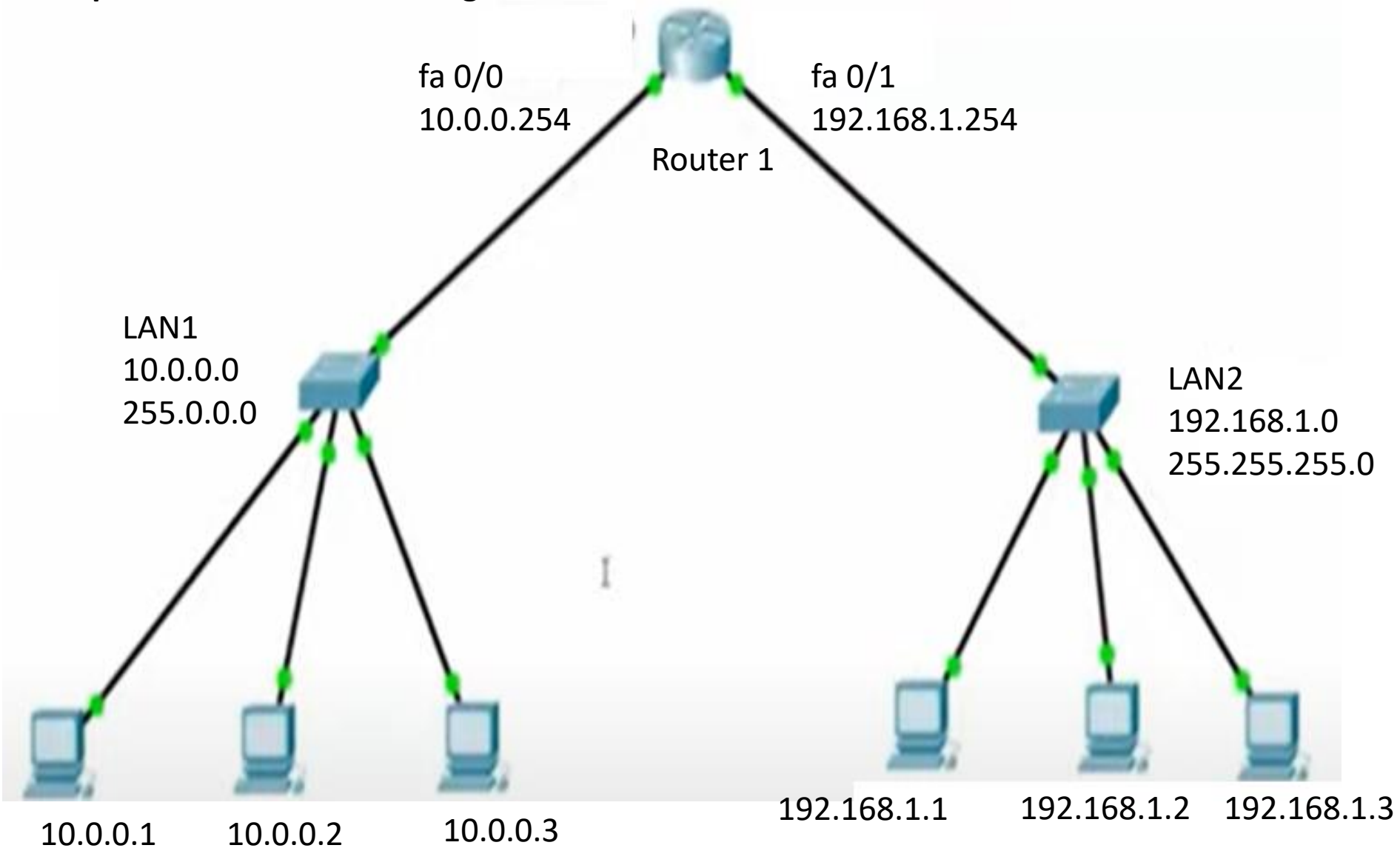
Click on “File” and then select “Save” to save your Packet Tracer project.

Task-3: Establish a simple LAN using Switch (Try Your self).



Task-4: Establish Peer to Peer network connection using two systems using Switch and Router in a LAN.

Step 1: Create a the following network in Packet Tracer



2. Configure a Cisco Router

Step 1: Access Command Line Interface

- Access the CLI (Command Line Interface) by clicking on Router 1.
- Say no when asked if you would like to enter the initial configuration dialog of the router.
- **Good To Remember:**
 - There are various command modes, and following are the some of the main command modes:
 - 1) User EXEC Mode Router>
 - 2) Privileged EXEC Mode Router#
 - 3) Global Configuration Mode Router(config)#
 - 4) Interface Configuration Mode Router(config-if)#
 - 5) Sub Interface Configuration Mode Router(config-subif)#

Step 2: Enter the Privileged EXEC Mode

- To enter the Privileged EXEC Mode, you have to use the command 'enable' in the CLI of Router 1.

Router>enable

Router#

Step 3: Switch to Global Configuration Mode

- Switch to the Global Configuration Mode by using the command 'configure terminal' in the Privileged EXEC Mode.

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Step 4: Change the router name

- Change the default router name from 'Router' to 'R1'.
- You can configure any desired name on the router as per the topology you're creating. This helps you to differentiate the device from other devices in the network. The command to change name is 'hostname name'.

Router(config)#hostname R1

Step 5: Assign IP Addresses

- Assign IP Addresses to the interfaces of Router 1.
- Assigning IP to the router is very important and is required to make your router be able to forward packets from/to networks.
- Configuring 192.168.1.254 and 10.0.0.254 on interface fa 0/1 and fa 0/0, respectively.

- Commands to configure IP Address and make the interface fa 0/1 up:

R1(config)#

R1(config)#interface fa 0/1

R1(config-if)#ip address 192.168.1.254 255.255.255.0

R1(config-if)#no shutdown

R1(config-if)#

- %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

- Commands to configure IP Address and make the interface fa 0/0 up:

R1(config)#

R1(config)#interface fa 0/0

R1(config-if)#ip address 10.0.0.254 255.0.0.0

R1(config-if)#no shutdown

R1(config-if)#

- %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

After assigning the IP Addresses and turning on the ports, you'll observe the link lights turning green. This represents that the port is now in forwarding mode and can be used to transmit the data.

Step 3: Assign IP Address to all PCs

- Click on PC 0 and open the Desktop Tab.
- Go to the IP Configuration and assign IP Address 10.0.0.1 with the default subnet mask 255.0.0.0 and gateway 10.0.0.254 on PC 0
- Assign IP address to other PCs

Step 4: Check connectivity

- Checking the connectivity between devices.
- We will now ping from PC 0 to PC 1 to check if they can communicate.
- Click on PC 0, go to the Desktop Tab, and click on Command Prompt.
- Use the command 'ping ***IP Address of Destination***'
- Packet Tracer PC Command Line 1.0
- C:\>ping 192.168.1.2
- Pinging 192.168.1.2 with 32 bytes of data:
- Request timed out.
- Request timed out.
- Reply from 192.168.1.2: bytes=32 time<1ms TTL=126
- Reply from 192.168.1.2: bytes=32 time<1ms TTL=126
- Ping statistics for 192.168.1.2:
- Packets: Sent = 4, Received = 2, Lost = 2 (50% loss),
- Approximate round trip times in milli-seconds:
- Minimum = 0ms, Maximum = 0ms, Average = 0ms

Step 5: Saving the Packet Tracer Project

Task: 5 Establish two LANs via Router (Try your self)

