

PRACTICAL 1

Aim: Demonstrate the connection between two LAN connections with one router using cisco packet tracer.

Theory:

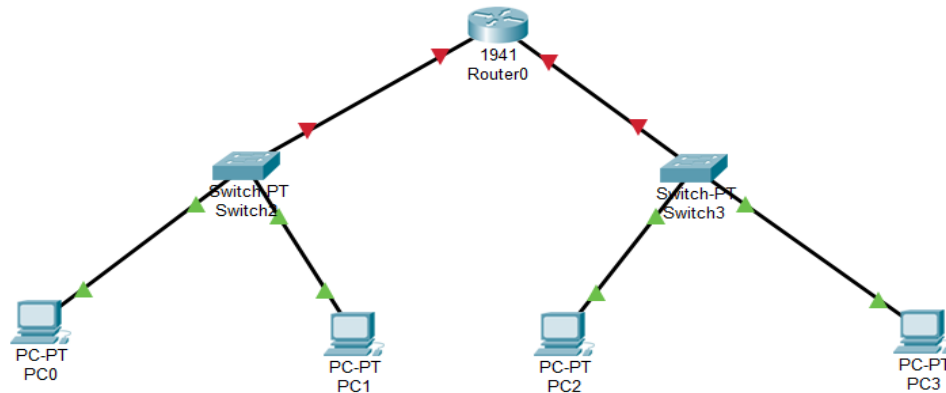
❖ Router:

- It is a networking device that forwards data packets between computer networks.
- It performs the traffic directing functions on the Internet.
- The main purpose of a router is to connect multiple networks and forward packets to its destination either for its own networks or other networks.
- Router is connected to many data lines from different networks. When a data packet comes in one of the lines, the router reads the network address (IP address) information in the packet to determine the ultimate destination.
- Router operates at the Network layer.

❖ LAN:

- A Local Area Network (LAN) is a group of computer and associated devices that share a common communications line or wireless link to a server.
- A LAN can be small or large, ranging from a home network with one user to an enterprise network with several users and devices in an office or school.
- Its single defining characteristic is that it connects devices that are in a single, limited area.
- Ethernet and Wi-Fi are the two primary ways to enable LAN connections.

Topology:



Steps of Configuration:

- First step is to create the topology. For that click on the devices and drop on workplace and connect all the devices with the necessary cables.
- Next step is to configure the router using CLI
 - ✓ Click on router and go to the CLI tab.
 - ✓ To get in to the configuration mode, write router > enable
 - ✓ To configure the terminal, write router # configure terminal
 - ✓ To get into privilege mode, write router (config) # interface gigabitEthernet 0/0
 - ✓ To set the IP address, write router (config-if) # ip address 10.1.1.3 255.0.0.0
 - ✓ To switch on the router, write router (config-if) # no shut.

```

Router0
Physical Config CLI Attributes
IOS Command Line Interface

*****
http://www.cisco.com/wcd/export/crypto/cool/stgqr.html
If you require further assistance please contact us by sending email to
export@cisco.com.

Cisco CISC01941/ES (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTK152400K5
2 Gigabit Ethernet interfaces
DRAM configuration is 64 bits wide with parity disabled.
256K 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]: n

Press RETURN to get started!

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 10.1.1.3 255.0.0.0
Router(config-if)#no shut
Router(config-if)#
%LINK-3-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)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 20.1.1.3 255.0.0.0
Router(config-if)#no shut
Router(config-if)#
%LINK-3-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
Router(config-if)#exit
Router(config)#
Ctrl+F6 to exit CLI focus
Copy Paste

```

- Follow the same steps to provide IP Address 20.1.1.3 to interface 0/1.
- Provide IP address to all the PC connected in LAN
 - ✓ Click on PC, go to Desktop tab in that IP Configuration option
 - ✓ Provide IP address and default gateway. Here default gateway is the address of router interface 0/0 for the network 1 and for network 2 default gateway is the IP address of router interface 0/1.

The screenshot shows a window titled "PC0" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there are four tabs: "Physical", "Config", "Desktop" (which is selected and highlighted in blue), "Programming", and "Attributes".

Under the "Desktop" tab, there is a section titled "IP Configuration" with a close button (X) in the top right corner. Below this title is a dropdown menu labeled "Interface" with "FastEthernet0" selected. The "IP Configuration" section contains two radio buttons: "DHCP" (unselected) and "Static" (selected). Below these are five text input fields:

- IP Address: 10.1.1.1
- Subnet Mask: 255.0.0.0
- Default Gateway: 10.1.1.3
- DNS Server: 0.0.0.0

Below the IP Configuration section is the "IPv6 Configuration" section. It contains three radio buttons: "DHCP" (unselected), "Auto Config" (unselected), and "Static" (selected). Below these are four text input fields:

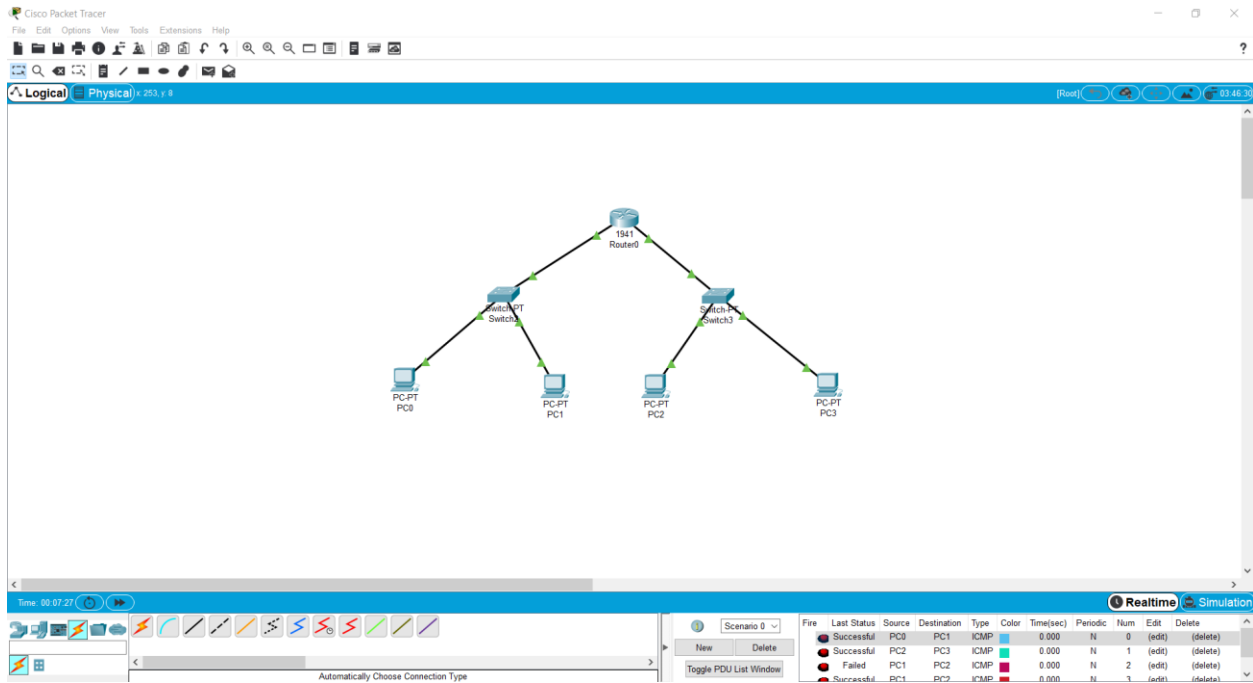
- IPv6 Address: (empty) / (empty)
- Link Local Address: FE80::290:21FF:FE8A:D041
- IPv6 Gateway: (empty)
- IPv6 DNS Server: (empty)

Below the IPv6 Configuration section is the "802.1X" section. It contains a checkbox labeled "Use 802.1X Security" which is unchecked. Below this is a dropdown menu labeled "Authentication" with "MD5" selected. Below the dropdown are two text input fields labeled "Username" and "Password", both of which are empty.

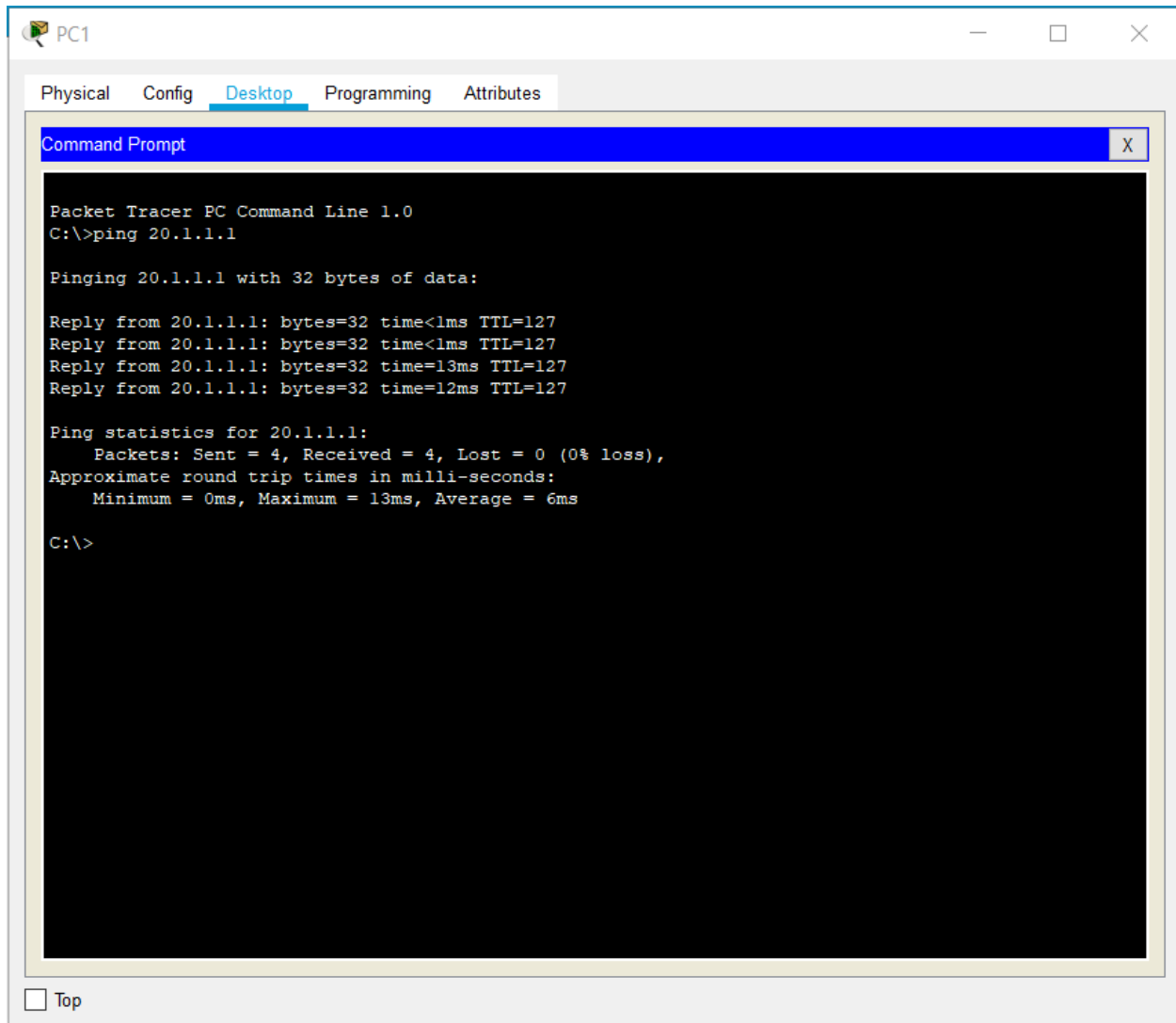
At the bottom left of the window, there is a checkbox labeled "Top" which is unchecked.

Check Network Topology:

- To check the connection are working properly or not drop one package on the PC of network 1 and receive it from the PC of network 2.



- You can also check if the connections are working properly or not by following these steps;
 - ✓ Click on PC of Network 1, go to Desktop tab in that Command Prompt option
 - ✓ Then simply write C: \> ping 20.1.1.1 (// IP address of PC from Network 2)



The screenshot shows a Packet Tracer PC window titled 'PC1'. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the 'ping 20.1.1.1' command. The output indicates that the ping was successful, with 4 packets sent and 4 received, resulting in 0% loss. The round trip times are listed as Minimum = 0ms, Maximum = 13ms, and Average = 6ms.

```
Packet Tracer PC Command Line 1.0
C:\>ping 20.1.1.1

Pinging 20.1.1.1 with 32 bytes of data:

Reply from 20.1.1.1: bytes=32 time<1ms TTL=127
Reply from 20.1.1.1: bytes=32 time<1ms TTL=127
Reply from 20.1.1.1: bytes=32 time=13ms TTL=127
Reply from 20.1.1.1: bytes=32 time=12ms TTL=127

Ping statistics for 20.1.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 13ms, Average = 6ms

C:\>
```

Conclusion:

From this practical, we are able to understand to modes of router and how to configure the router with the help of CLI. We also learn the use of gateway while working with two different networks