

Report – Simulation based Learning

Academic Year	2023 -2024
Subject	Computer Networks
Faculty	Mr. Rupesh Ravi M R
Innovative Teaching method	Simulation based learning (Packet Tracer)
Topic/Question	Implementation of Static Routing in Cisco – 2 Router Connections
Whether the work posted in website	Yes
Peer reviewed by	Dr. Sooraj T R, Ms. Mruthula N R
Reproducible and developed further by other scholars	Yes

Goals:

1. Familiarisation of networking devices
2. Identifying suitable IP range for each branch
3. Static Routing
4. Establish communication between devices
5. Network trouble shooting

Use of appropriate methods:

1. Tool used : Cisco Packet Tracer
2. Commands used for trouble shooting : ping
3. Devices used: Routers, Switches and PCs

Design:

Steps to Configure and Verify Two Router Connections in Cisco Packet Tracer:

Step 1: First, open the cisco packet tracer desktop and select the devices given below:

S.NO	Device	Model Name	Qty.
1.	PC	PC	4
2.	Switch	PT-Switch	2
3.	Router	PT-Router	2

IP Addressing Table for PCs:

S.NO	Device	IPv4 Address	Subnet Mask	Default Gateway
1.	pc0	192.168.1.2	255.255.255.0	192.168.1.1
2.	pc1	192.168.1.3	255.255.255.0	192.168.1.1
3.	pc2	192.168.2.2	255.255.255.0	192.168.2.1
4.	pc3	192.168.2.3	255.255.255.0	192.168.2.1

Then, create a network topology as shown below the image.

Use an Automatic connecting cable to connect the devices with others.

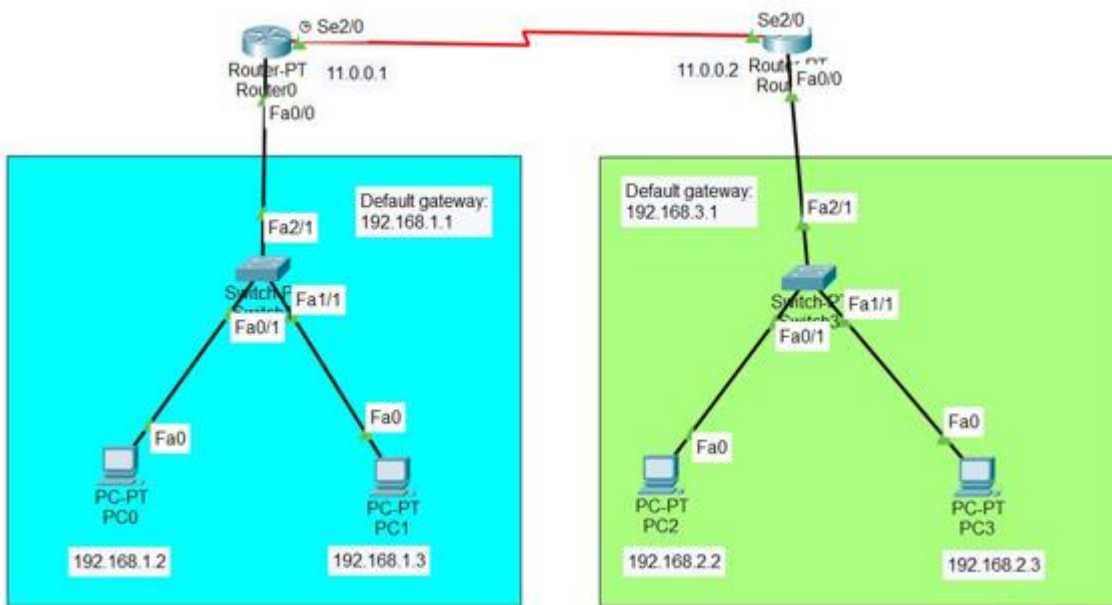
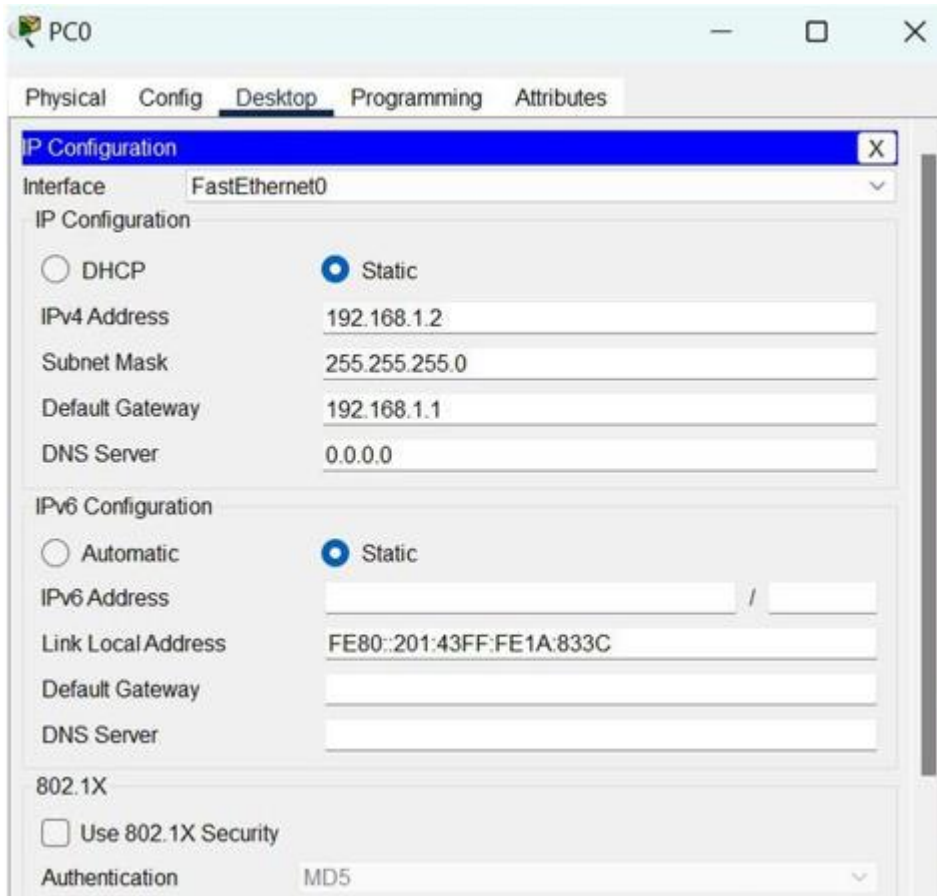


Fig 1: Static Routing

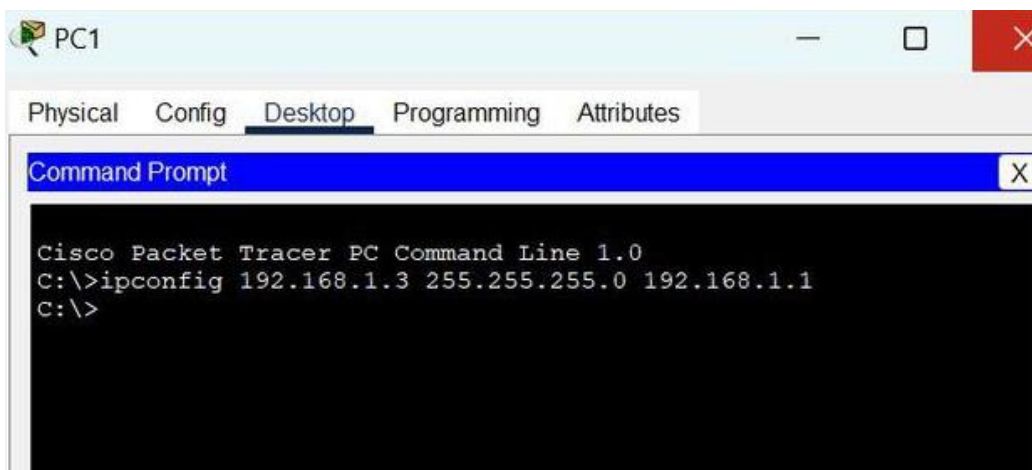
Step 2: Configure the PCs (hosts) with IPv4 address and Subnet Mask according to the IP addressing table given above.

- To assign an IP address in PC0, click on PC0.
- Then, go to desktop and then IP configuration and there you will IPv4 configuration.
- Fill IPv4 address and subnet mask.



Step 3: Assigning IP address using the ipconfig command.

- We can also assign an IP address with the help of a command.
- Go to the command terminal of the PC.
- Then, type ipconfig <IPv4 address><subnet mask><default gateway>(if needed)
Example: ipconfig 192.168.1.3 255.255.255.0 192.168.1.1

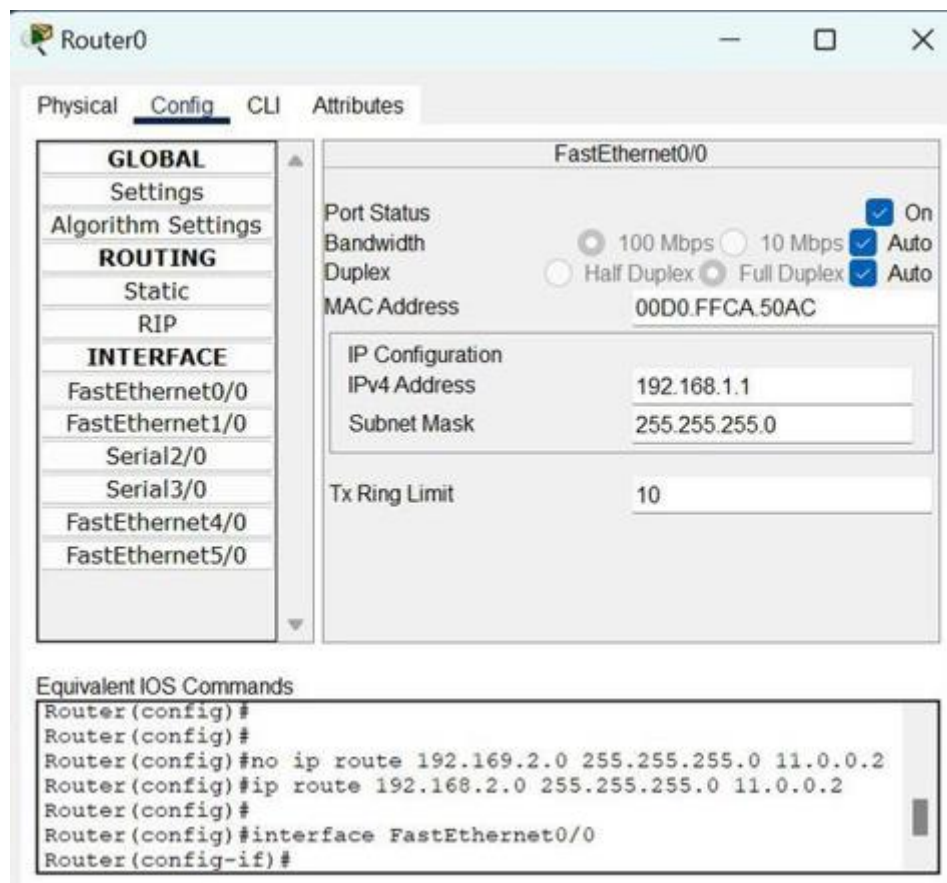


- Repeat the same procedure with other PCs to configure them thoroughly.

Step 4: Configure router with IP address and subnet mask.

S.NO	Device	Interface	IPv4 Addressing	Subnet Mask
1.	router0	FastEthernet0/0	192.168.1.1	255.255.255.0
		Serial2/0	11.0.0.1	255.255.255.0
2.	router1	FastEthernet0/0	192.168.2.1	255.255.255.0
		Serial2/0	11.0.0.2	255.255.255.0

- To assign an IP address in router0, click on router0.
- Then, go to config and then Interfaces.
- Then, configure the IP address in FastEthernet and serial ports according to IP addressing Table.
- Fill IPv4 address and subnet mask.



- Repeat the same procedure with other routers to configure them thoroughly.
- Step 5: After configuring all of the devices we need to assign the routes to the routers.

- To assign static routes to the particular router:
- First, click on router0 then Go to CLI.
- Then type the commands and IP information given below.
- Static Routes for Router0 are given below:
Router(config)#ip route 192.168.2.0 255.255.255.0 11.0.0.2
- Static Routes for Router1 are given below:
Router(config)#ip route 192.168.1.0 255.255.255.0 11.0.0.1

Questions/Tasks:

1. How do you establish communication if the computers are at distant locations?
2. Explain the trouble shooting process
3. What do you mean by Subnetting?

Step 6: Verifying the network by pinging the IP address of any PC. We will use the ping command to do so.

- First, click on PC1 then Go to the command prompt
- Then type ping <IP address of targeted node>
- As we can see in the below image we are getting replies which means the connection is working very fine

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Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig 192.168.1.3 255.255.255.0 192.168.1.1
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=15ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 15ms, Average = 4ms

C:\>

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Presentation and Reflective critique:

1. Explained the devices of Computer networks
2. Routing Algorithms
3. Experts suggested to include routers and to ensure the communication between two computers which are located at two different locations.

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