# **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.	рсО	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.	рс3	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 PCO, click on PCO.
- Then, go to desktop and then IP configuration and there you will IPv4 configuration.
- Fill IPv4 address and subnet mask.

PC0		-	×
Physical Config Des	sktop Programming Attributes		
IP Configuration			x
Interface FastEth IP Configuration	ernet0		~
	O Static		
IPv4 Address	192.168.1.2		
Subnet Mask	255.255.255.0		
Default Gateway	192.168.1.1		
DNS Server	0.0.0.0		
IPv6 Configuration			
<ul> <li>Automatic</li> </ul>	O Static		- 1
IPv6 Address		1	
Link Local Address	FE80::201:43FF:FE1A:833C		
Default Gateway			
DNS Server			
802.1X			
Use 802.1X Securit	у		
Authentication	MD5		

**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.

Ston	A. Configur	o routor v	with ID	addrocc	and	subnot	mack
step	<b>4</b> : Comigui	e router v		auuress	anus	subliet	mask.

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

GLOBAL		I	FastEthernet0/0
Settings Algorithm Settings ROUTING Static RIP		Port Status Bandwidth Duplex MAC Address	Or 100 Mbps 10 Mbps Auto Half Duplex Full Duplex Auto 00D0.FFCA.50AC
INTERFACE FastEthernet0/0 FastEthernet1/0 Serial2/0		IP Configuration IPv4 Address Subnet Mask	192.168.1.1 255.255.255.0
Serial3/0 FastEthernet4/0 FastEthernet5/0		Tx Ring Limit	10
	W		
quivalent IOS Comman Router (config) #	ds		
Router(config)# Router(config)#no Router(config)#ig Router(config)#	o ig p re	o route 192.169.2.0 oute 192.168.2.0 25	0 255.255.255.0 11.0.0.2 55.255.255.0 11.0.0.2

- 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

PC1					—		×
Physical	Config	Desktop	Programming	Attributes			
Comman	d Prompt						X
Cisco C:\>ip C:\>pi	Packet config ng 192.	Tracer PC 192.168.1 168.2.2	C Command Li 1.3 255.255.	ne 1.0 255.0 192.1	68.1.1		
Pingin	g 192.1	68.2.2 wi	ith 32 bytes	of data:			
Reply Reply Reply Reply	from 19 from 19 from 19 from 19	2.168.2.2 2.168.2.2 2.168.2.2 2.168.2.2	2: bytes=32 2: bytes=32 2: bytes=32 2: bytes=32	time=15ms T time=1ms TT time=1ms TT time=1ms TT	TL=126 L=126 L=126 L=126		
Ping s Pa Approx Mi C:\>	tatisti ckets: imate r nimum =	cs for 19 Sent = 4, ound trip 1ms, Max	92.168.2.2: Received = times in m timum = 15ms	4, Lost = illi-second , Average =	0 (0% los s: 4ms	s),	

## 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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