

**Tribhuvan University**  
Institute of Engineering  
**Pulchowk Campus**

COMPUTER NETWORKS

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**Lab 3**

Basic Configuration of Router

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SUBMITTED BY:

Bishal Katuwal  
075BCT028

SUBMITTED TO:

Prof.Sharad Kumar Ghimire  
Department of Electronics and Computer Engineering  
Pulchowk Campus

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## Title

### Basic Configuration of Router

## Objectives

- To be familiar with Network Simulation Tool: Packet Tracer
- To be familiar with router, and its different components
- To be familiar with commands for basic configuration of a router
- To be familiar with default gateway and its need

## Required Tool

- Network simulation tool: Packet Tracer

## Activities

Following network in Packet tracer by interconnection of a router, two switches and four computers was created.

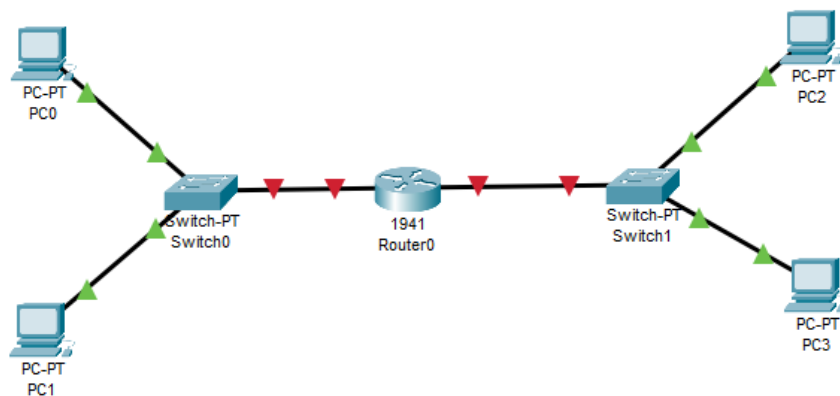


Figure 1: Initial Setup

1. IP of PC0, PC1, PC2 and PC3 were set and subnet mask were set as follows.

- PC0 : 200.10.8.2
- PC1 : 200.10.8.3
- PC2 : 200.10.9.2
- PC3 : 200.10.9.3
- Subnet mask : 255.255.255.0

2. Ping command was used to test the connectivity from PC0 to PC1, PC2 and PC3.

Connection to PC0 and PC1 was found whereas PC2 and PC3 were unreachable. This is because the router hadn't been setup completely.

3. Ping command was used to test the connectivity from PC2 to PC0, PC1 and PC3.

Connection to PC2 and PC3 was found whereas PC0 and PC1 were unreachable. This is because the router hadn't been setup completely.

4. Router was configured to have "Bishal" as hostname.

```
Router(config)#hostname Bishal
```

5. Console password was set to be "Katuwal".

```
Bishal(config)#line console 0
Bishal(config-line)#password Katuwal
Bishal(config-line)#login
```

6. Enable password was set to be "cisco".

```
Bishal(config)#enable password cisco
```

7. Telnet password was set to be "class".

```
Bishal(config)#line vty 0 4
Bishal(config-line)#password class
Bishal(config-line)#login
```

8. IP address of GigabitEthernet 0/0 of router was set to 200.10.8.1 with a subnet mask of 255.255.255.0.

```
Bishal(config)#interface GigabitEthernet 0/0
Bishal(config-if)#ip address 200.10.8.1 255.255.255.0
Bishal(config-if)#no shutdown

Bishal(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
```

9. Command prompt was run in PC0 and connected to the router using telnet. Then configured the IP address of 200.10.9.1 with a subnet mask of 255.255.255.0 in the other interface of the router.

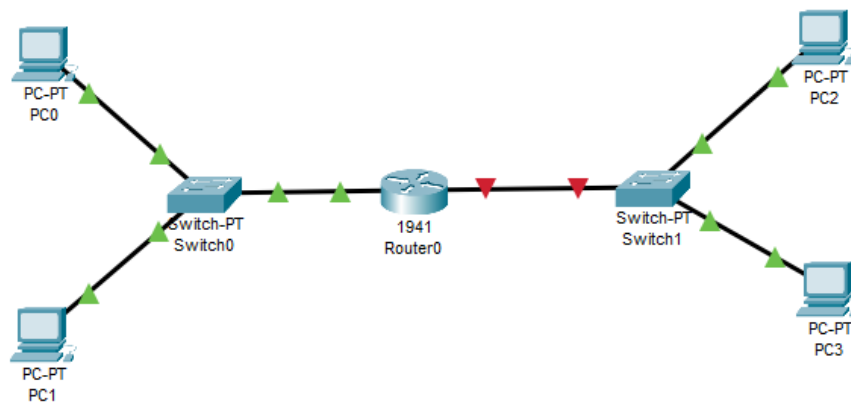


Figure 2: GigabitEthernet 0/0 Setup

```
C:\>telnet 200.10.8.1
Trying 200.10.8.1 ...Open

User Access Verification

Password:
Bishal>en
Password:
Bishal#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bishal(config)#interface GigabitEthernet 0/1
Bishal(config-if)#ip address 200.10.9.1 255.255.255.0
Bishal(config-if)#no shutdown
```

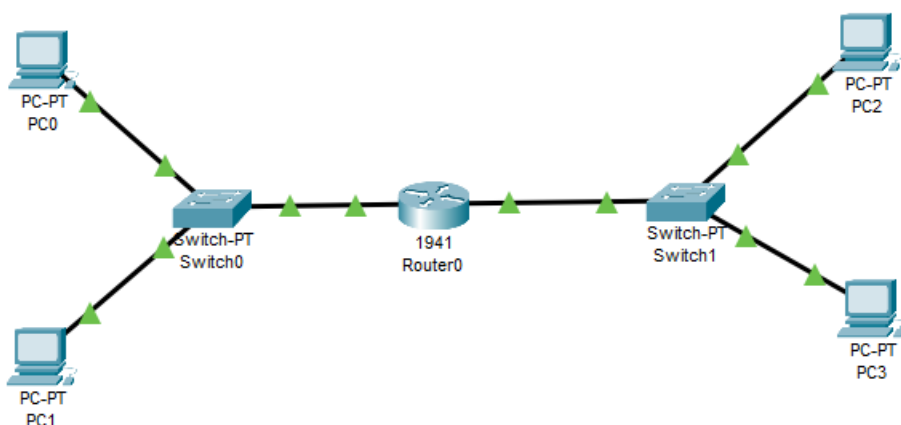


Figure 3: GigabitEthernet 0/0 and 0/1 Setup

10. Ping command was used to test the connectivity from PC0 to PC1, PC2, PC3 and both IP addresses of Router.

PC0 could connect to PC1 and 200.10.8.1 IP of router.

PC0 couldn't connect with PC2, PC3 and 200.10.9.1 IP of router.

11. Ping command was used to test the connectivity from PC3 to PC0, PC1, PC3 and both IP addresses of Router.

PC3 could connect to PC2 and 200.10.9.1 IP of router.

PC3 couldn't connect with PC0, PC1 and 200.10.8.1 IP of router.

12. Ping command was used to test the connectivity from router to PC0,PC1,PC2 and PC3.

```
Bishal>ping 200.10.8.2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 200.10.8.2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

```
Bishal>ping 200.10.8.3
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 200.10.8.3, timeout is 2 seconds:
```

```
.!!!!
```

```
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms
```

```
Bishal>ping 200.10.9.2
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 200.10.9.2, timeout is 2 seconds:
```

```
.!!!!
```

```
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms
```

```
Bishal>ping 200.10.9.3
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 200.10.9.3, timeout is 2 seconds:
```

```
.!!!!
```

```
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms
```

Router could connect to every PC.

13. Default gateway of PC0,PC1,PC2 and PC3 were setup.

- PC0 and PC1: 200.10.8.1
- PC2 and PC3: 200.10.9.1

14. Steps 10, 11 and 12 were repeated.

- Step 10: Ping command was used to test the connectivity from PC0 to PC1, PC2, PC3 and both IP addresses of Router.  
PC0 received sent packets from all other PCs and both router IPs.
- Step 11: Ping command was used to test the connectivity from PC3 to PC0, PC1, PC2 and both IP addresses of Router.  
PC3 received sent packets from all other PCs and both router IPs.

- Step 12: Ping command was used to test the connectivity from router to PC0,PC1,PC2 and PC3.

```
Bishal>ping 200.10.8.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 200.10.8.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/1/5 ms
```

```
Bishal>ping 200.10.8.3
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 200.10.8.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

```
Bishal>ping 200.10.9.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 200.10.9.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

```
Bishal>ping 200.10.9.3
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 200.10.9.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

After setting up Default gateway, each device was able to connect to any other IPs within the network as well as in another network.

## Conclusion

In this way “Lab 3: Basic Configuration of Router” was completed by simulation using Cisco Packet Tracer.

## Exercise

### 1. What is a router? Explain its role in computer networks.

A router is a networking device that forwards data packets between computer networks. It is connected to two or more data lines from different IP networks. When a data packet comes in on one of the lines, it reads the network address information in the packet header to determine the final destination and after using information in its routing table or routing policy, it directs the packet to the next network on its journey.

The roles of routers in computer networks are :

- Routing : A router routes the best path for a packet based on routing table as well as all other factors considered.

- Forwarding : A router forwards a packet towards its destination node via its determined path.
- Others : Some high-end routers also provide application. Security and VPN services.

2. **List out the basic configuration commands of the router (that you have used in this lab) with their syntax and functions.**

Command	Syntax	Function
Enable	en	Enables privileged mode in a router's terminal.
configure terminal	configure terminal	Start configuration mode
Hostname	hostname [name]	Renames host to [name]
Line	line [ aux — console — tty — vty ] line - number [ ending - line - number ]	Begins the command in line configuration mode
Password	password [pword]	Changes password to [pword]
Login	login	Requires login
Password Encryption	service password-encryption	Encrypts the password using MD5 encryption scheme
Show running configurations	show run	Shows all passwords
Interface Config Mode	interface [fastethernet/number]	Enters interface configuration mode for the specified fast ethernet interface
IP address	ip address [ip-address]	Assigns IP to given interface
Activate Interface	no shutdown	Activates given interface
Telnet	telnet [ip]	Telnet connection to target IP.
Ping	ping [ip]	Checks connectivity with given IP.

3. **Note down the observations of each steps with necessary commands specified in activity A mentioned above and comment on it.**

Refer to Activity section in lab sheet.