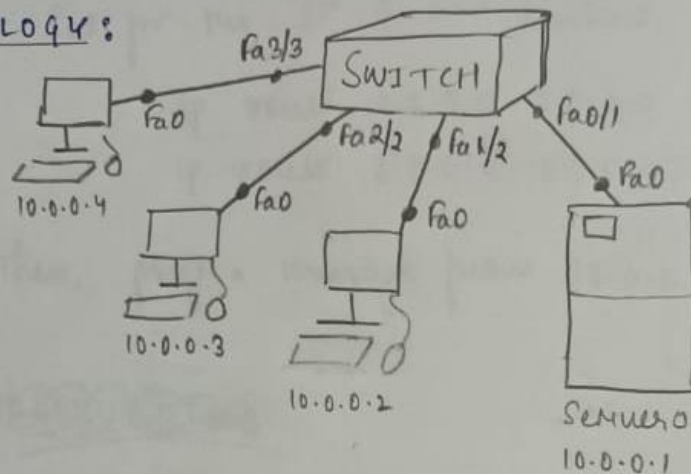


## Experiment 4

**AIM:** Configure DHCP within a LAN and outside LAN.

### ① Within a LAN

#### TOPOLOGY:



#### PROCEDURE:

- Create a LAN network (10.0.0.0) by selecting 3 PCs, a server and connect them to a SWITCH.
- Set the server's IP address to 10.0.0.1
- Set its default gateway to 10.0.0.20
- Set the server to DHCP mode  
(services → DHCP → Service ON)
- Put down the gateway & the start IP address & same.  
(10.0.0.2) & same.
- ~~Make~~ <sup>change</sup> all the other PCs ~~to~~ IP configuration to DHCP

#### Result

PC > Ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4 : bytes = 32 time = 1ms TTL = 128

Reply from 10.0.0.4 : bytes = 32 time = 0ms TTL = 128

Reply from 10.0.0.4 : bytes = 32 time = 0ms TTL = 128

Reply from 10.0.0.4 : bytes = 32 time = 0ms TTL = 128

Ping statistics for 10.0.0.4

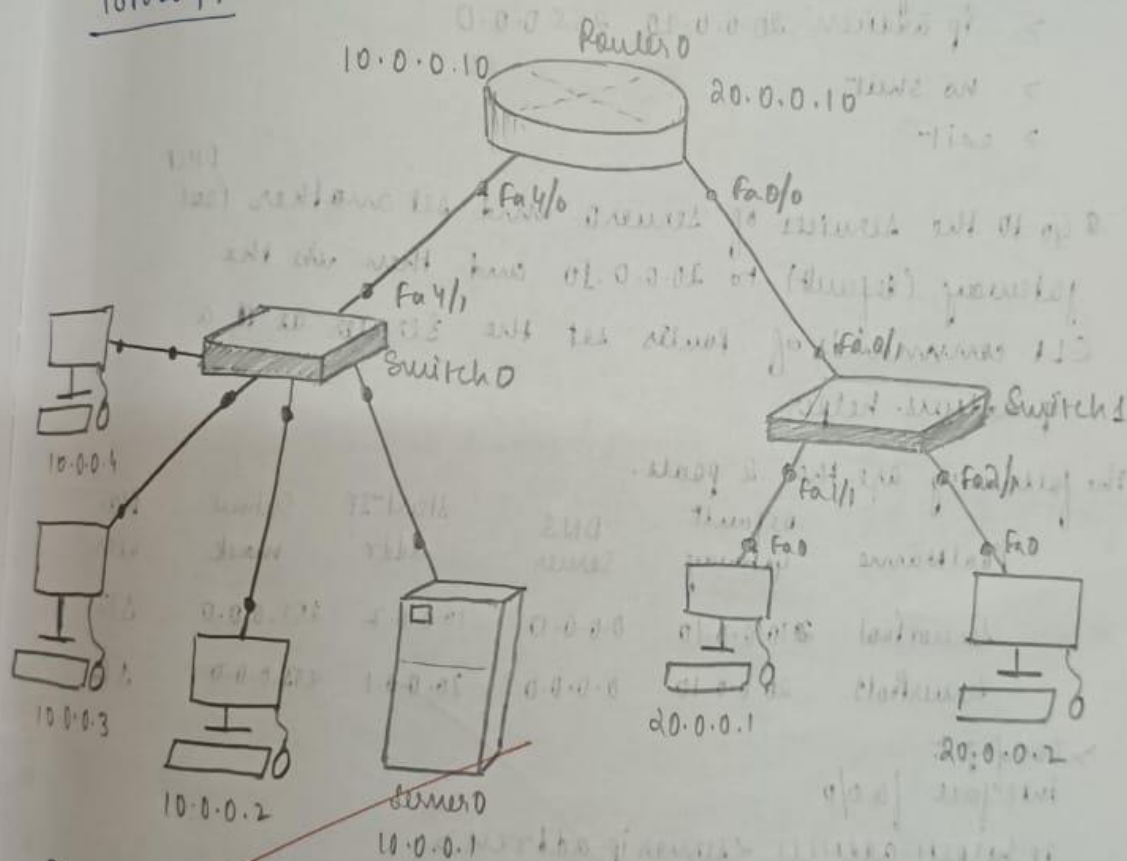
Packets: sent=4, Received=4, lost=0 (0% loss)

Approximate round trip times in milliseconds:

minimum=0ms, Maximum=1ms, Average=0ms

② Outside of LAN

### TOPOLOGY



### PROCEDURE:

- Follow the same steps as in case of 'inside LAN', by creating a 10.0.0.0 network with the Server IP address - 10.0.0.1 and the gateway ~~to~~ - 10.0.0.10
- Create another network with 2 PCs and a switch (20.0.0.0) and connect the 2 networks using a Router.





- Configure the router to connect the 2 networks through the gateway.

> enable

> config

~~repeat~~

> interface fa 4/0

> ip address 10.0.0.20 255.0.0.0

> no shut

> exit

> interface fa 0/0

> ip address 20.0.0.20 255.0.0.0

> no shut

> exit

- Go to the services of server0 and set another pool <sup>PHP</sup> gateway (default) to 20.0.0.10 and then via the CLI commands of router set the server as a ip-address-helper

The following are the 2 pools.

PoolName	default Gateway	DNS Server	Start IP addr	Subnet mask	Max user
serverpool	10.0.0.10	0.0.0.0	10.0.0.2	255.0.0.0	512
serverpool1	20.0.0.10	0.0.0.0	20.0.0.1	255.0.0.0	512

> config t

interface fa 0/0

ip helper-address <server ip address>

no shut // not needed

exit

- Ping from 10.0.0.2 to 20.0.0.2

# OUTPUT :

## 1. Inside

```
Command Prompt

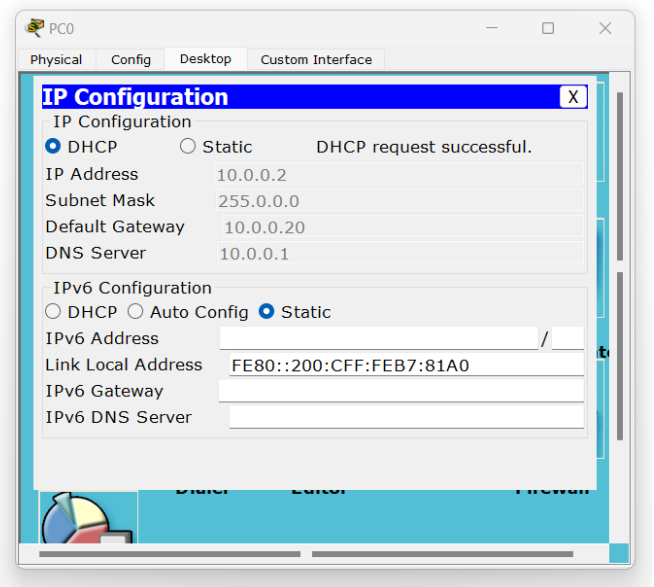
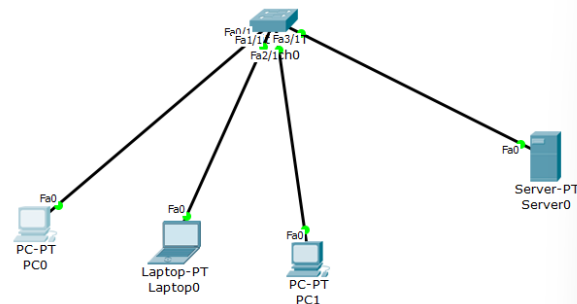
Packet Tracer SERVER Command Line 1.0
SERVER>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

SERVER>
```



## 2. Outside

# Command Prompt

X

```
Pinging 10.0.0.20 with 32 bytes of data:

Request timed out.

Ping statistics for 10.0.0.20:
    Packets: Sent = 2, Received = 0, Lost = 2 (100% loss),

Control-C
^C
PC>ping 20.0.0.2

Pinging 20.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Reply from 20.0.0.2: bytes=32 time=0ms TTL=127
Reply from 20.0.0.2: bytes=32 time=1ms TTL=127

Ping statistics for 20.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PC0

Physical Config Desktop Custom Interface

### IP Configuration

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IP Address 10.0.0.2

Subnet Mask 255.0.0.0

Default Gateway 10.0.0.20

DNS Server 10.0.0.1

IPv6 Configuration

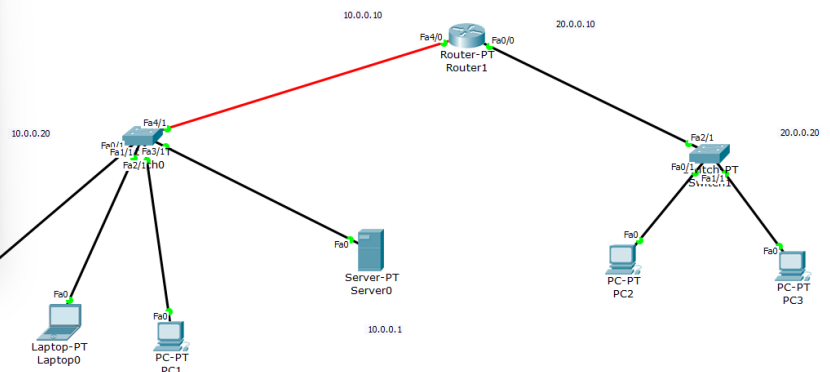
☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::200:CFE:FEB7:81A0

IPv6 Gateway

IPv6 DNS Server





## OBSERVATION:

### Observation :

- The DHCP (Dynamic Host Configuration Protocol) helps manage allocation of IP address to end users.

The device wanting to access a network gets an IP address allocated dynamically to it by the server.

• The allocated IP address is taken back, when shutdown.

- ~~also~~ If the requesting device is outside the LAN (case 2), then the server's IP address must be assigned to the router as the "address-helper" so that it can automatically configure that device's IP address.

- when trying outside the current network, at first it shows "Request timed out" as the Router takes time to find the correct destination

- We assign another server (at) in the server's services so that the server knows the gateway to target and the starting IP addresses to assign to the devices of a different network