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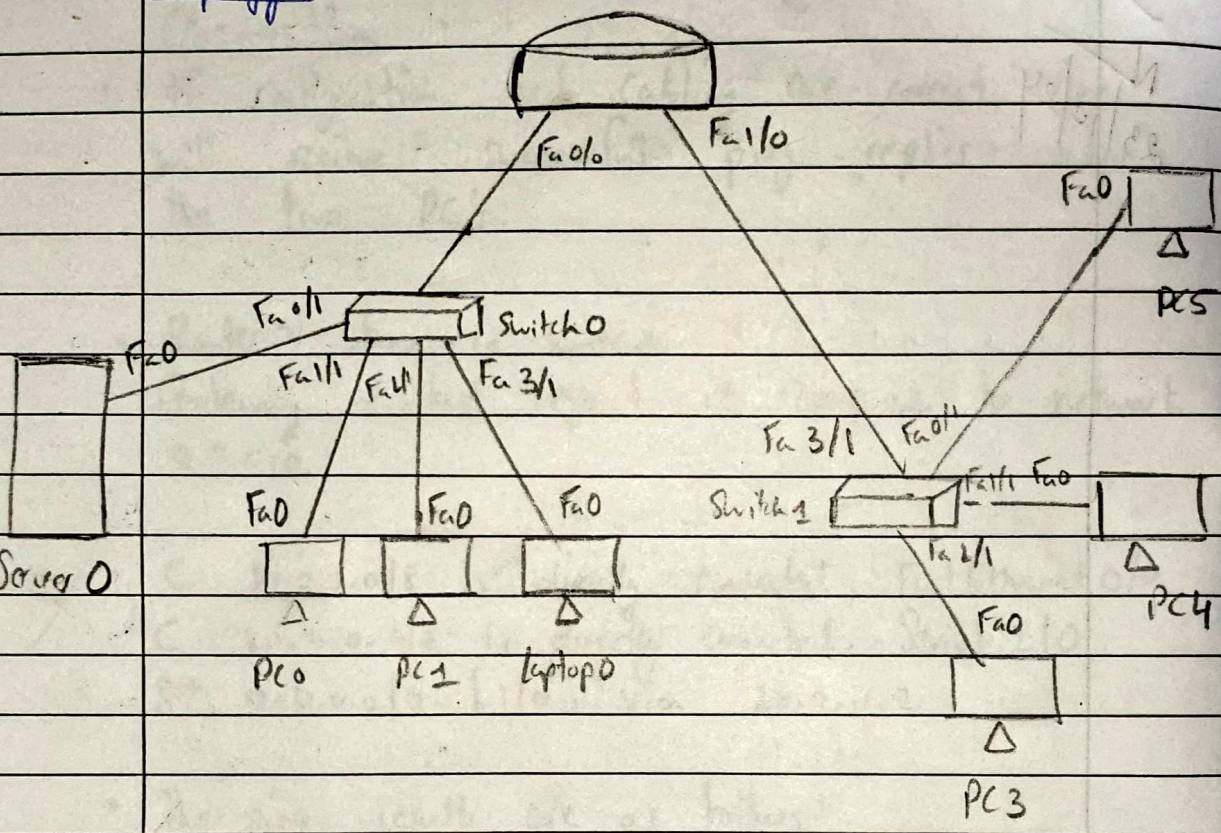
Experiment 4 - Configure DHCP within a LAN and outside LAN

Aim - Demonstrate DHCP within and outside a LAN

Topology



1. Switch0 connected Router0 interface Fa0/0 using copper straight-through cable from Eth 6/1.

2. PC0, PC1, PC2 connected ~~to~~ ~~Router0~~ Switch0 via copper straight cable with IP address - 10.0.0.2, 10.0.0.3 and 10.0.0.4 respectively.

3. Server0 connected to Switch0 with ip address 10.0.0.2.

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4. PC 3, PC4, PC5 connected to Switch 1 with ip addresses 20.0.0.3, 20.0.0.4 and 20.0.0.5.

Procedure

- Open cisco packet tracer and drag the following components -
- → Router : Place 1 router in the middle.
- → Switch : Connect two switches to Router 0.
- → PC : Take 3 PC's, and connect it to Switch 0, and another 3 PC's to Switch 1.
- → Server : Place one Server and connect it to the Switch 1 via ~~cross~~ copper Straight-through cable.

Configure Server 0 by clicking on the server and click IP configuration
Set IP address as 10.0.0.2,
Subnet mask as 255.0.0.0
Default Gateway as 10.0.0.1

- In DHCP services, add ~~Server~~ Switch 0 config. with
Pool Name - Switch 0
Start IP address - 10.0.0.0
Default Gateway - 0.0.0.0
Subnet Mask - 255.0.0.0

- In DHCP services add switch 1 config. with
Pool Name - ~~to server~~ Switch 1
Start IP address - 10.0.0.3
Default Gateway - 10.0.0.1
Subnet Mask - 255.0.0.0

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- Set the IP configuration of all PC's PC0 to PC1 to DHCP due to which each PC attains its IP address, Subnet Mask, Default Gateway.

- Configure Router0 by clicking on the router and selecting CLI.
Assign IP addresses to the router interfaces:

```
Router > enable
Router # configure terminal
Router (config) # interface fa 0/0
Router (config) # ip address 10.0.0.1 255.0.0.0
Router (config) # ip helper-address 10.0.0.2
Router (config) # no shut

Router (config) # interface fa 1/0
Router (config) # ip address 20.0.0.1 255.0.0.0
Router (config) # ip helper-address 10.0.0.2
Router (config) # no shut
Router # exit
```

Observation:

- If config. and cabling are correct, you will recieve successful ping replies b/w two PC's.

```
PC > ping 10.0.0.3
Pinging 10.0.0.3 with 32 bytes of data

Reply from 10.0.0.3 : bytes = 32 time = 1ms TTL = 120
Reply from 10.0.0.3 : bytes = 32 time = 0ms TTL = 120
Reply from 10.0.0.3 : bytes = 32 time = 0ms TTL = 120
```

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Reply from 10.0.0.3: bytes = 32 time = 2ms TTL = 120

Ping statistics for 10.0.0.3:
Packets: Sent = 4, Recieved = 4, Loss = 0 (0% loss)
Approximate round trip times in milliseconds:
Minimum = 0 ms, Maximum = 2 ms, Average = 0 ms

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Placing the DHCP server in the same subnet as clients to ensure broadcasts reach the server directly. Dynamic IP are given to systems connected in same network. When we have dynamically assigned ip address to another network, we do so by using a router and server.

If connections are successful, the ip addresses are assigned within the LAN and outside the LAN.