Experiment 4

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1. **Aim**: Configure and Understand working of network devices Hub, Switch and Router.

2. **Objectives:**
   The objective of this experiment is to configure and understand the operational roles and functions of network devices such as hubs, switches and routers in a network environment.

3. **Apparatus used:** Packet tracer

4. **Theory:**

Hub	Switch	Router
Physical layer	Data Link Layer	Network Layer
Connects network of personal computer together	Allow connections to multiple devices, manage ports	Direct data in a network
Electrical signal or bits	Frame & packet	Packet
Non-Intelligent Device	Intelligent Device	Intelligent Device
Half Duplex	Half/Full Duplex	Full Duplex
Mac Address	Mac Address	IP Address
Least costing	Expensive than hub	Most expensive
All ports fall into broadcast domain	All ports fall into broadcast domain	All port have own separate broadcast domain
Just a Multiport repeater	Just a faster bridge with 'n' ports	Gateway b/w different networks

5. **Implementation:**
   1. Launch cisco packet tracer on your system.
   2. Add an connect PCs to create two networks, intra-connected by hubs and switches and interconnected via router.
   3. Configure IP Addresses of the PCs to simulate two different networks.

4. Set Gateways in the PCs such that the devices on same network use gateway for communication.
5. Access the router's interface to set the IP, I/P and O/P Gateway to enable communication between two networks. NOTE- Turn on Router before use.
6. Simulate packet transfer within the network and across the network to verify the functionality of the networking components such as hub, switch and router.

6. Output:

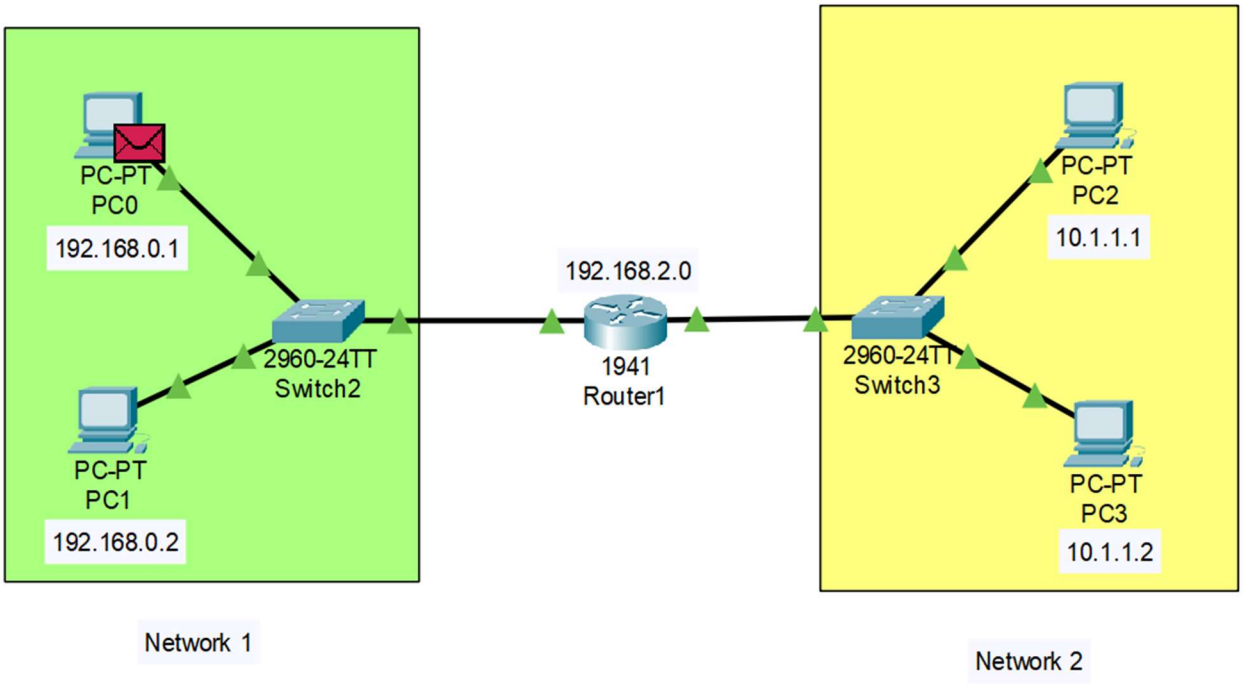

Figure 1 Two networks interconnected by a router

7. Learning Outcome:

- Learnt distinct functionality of hubs, switches and routers ; including how they interact and operate in a network.
- Learnt gateway configuration, IP Configuration for proper routing within networks.
- Simulating packets to confirm the connection is established or not.
- Develop ability to analyse and interpret network traffic flow.
- Learned to troubleshoot device configuration issues.