Lab no: 5 ***Date: 2024/09/23***

Title: Creating a Local Area Network and testing the connectivity within the network

Objectives:

- To create a local area network (LAN).
- To test data transfer and communication between devices within the LAN.

Background Theory:

A Local Area Network (LAN) is a network that connects computers and devices within a limited geographical area, such as a home, office, or school. LANs enable devices to share resources, such as files, printers, and internet connections, and allow seamless communication between them. In a typical LAN setup, devices are connected through a switch, which manages the internal traffic. Each device is assigned an IP address within the same subnet, ensuring they can communicate effectively.

Observation and Findings:

The router was configured to connect devices within a single LAN, each assigned an IP address within the same range. The LAN consisted of a switch connecting the server and multiple end devices, enabling smooth internal communication and resource sharing.

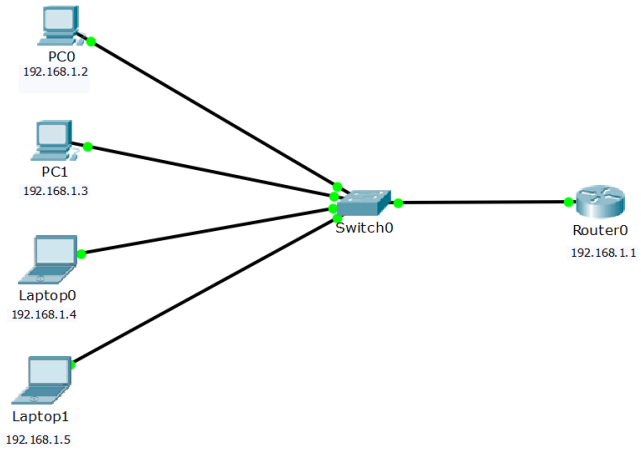

Fig: Interconnection of LAN

Output:

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.1.5

Pinging 192.168.1.5 with 32 bytes of data:

Reply from 192.168.1.5: bytes=32 time=0ms TTL=128
Reply from 192.168.1.5: bytes=32 time=0ms TTL=128
Reply from 192.168.1.5: bytes=32 time=0ms TTL=128
Reply from 192.168.1.5: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

Discussions:

The local area network (LAN) was configured by assigning appropriate IP addresses to all devices within the same subnet. Successful ping tests between the devices confirmed smooth communication. This setup demonstrates how a switch effectively manages traffic within a LAN, while the router can be used for routing traffic if needed.

Conclusion:

The LAN was successfully created, allowing seamless communication between devices. This configuration is ideal for small to medium-sized networks, providing a solid foundation for internal connectivity, with the potential for future expansion or external connections using a router.