Practical – 2

Aim of the Practical :- To configure a Local Area Network (LAN) with multiple switches and PCs, assign static IP addresses, and verify connectivity using Packet Tracer simulation.

Requirements :- Packet Tracer, PC's, Switches, Ethernet cable and Server.

Figure 1: LAN Setup with Two Switches

This figure shows a network topology in Cisco Packet Tracer consisting of six PCs connected across two switches. Switch0 connects three PCs (PC0, PC1, PC2), while Switch1 connects the other three (PC3, PC4, PC5). Both switches are linked together, forming a single extended LAN. This setup demonstrates how switches interconnect multiple devices within the same network, enabling efficient communication.

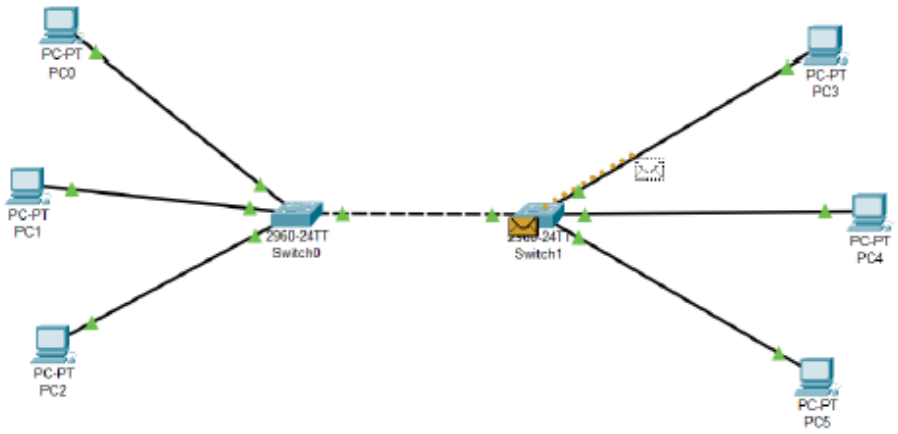


Figure 2 (Practical 2): Connectivity Verification Using Ping

This figure displays the command prompt outputs of connectivity tests. Using the ping command, PC0 successfully communicates with other PCs. All packets were sent and received with 0% loss, confirming that the LAN is fully operational and all devices can communicate through the interconnected switches.

```
Reply from 192.168.1.14: bytes=32 time<1ms TTL=128
Reply from 192.168.1.14: bytes=32 time<1ms TTL=128
Reply from 192.168.1.14: bytes=32 time<1ms TTL=128
Reply from 192.168.1.14: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.13

Pinging 192.168.1.13 with 32 bytes of data:

Reply from 192.168.1.13: bytes=32 time<1ms TTL=128
Reply from 192.168.1.13: bytes=32 time=1ms TTL=128
Reply from 192.168.1.13: bytes=32 time<1ms TTL=128
Reply from 192.168.1.13: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.1.12

Pinging 192.168.1.12 with 32 bytes of data:

Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.1.11

Pinging 192.168.1.11 with 32 bytes of data:

Reply from 192.168.1.11: bytes=32 time<1ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128
```

Figure 3: PC Connected to Server via Switch

This figure shows a simple client-server setup in Cisco Packet Tracer. A PC (PC6) is connected to a server (Server0) through a switch. This design demonstrates how a client system can access services hosted on a server within the same network using basic LAN infrastructure.

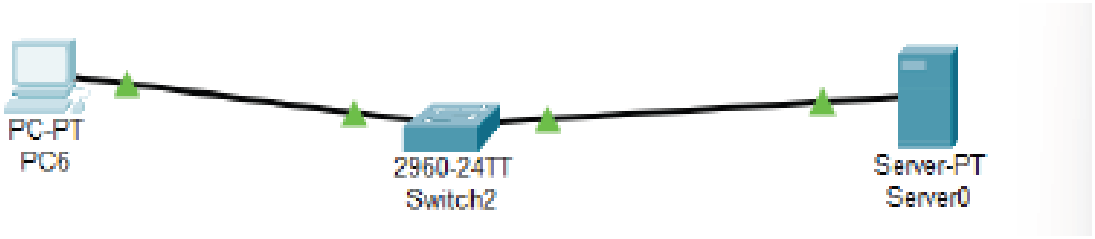


Figure 4: Accessing Server Web Page

This figure shows the use of the web browser on a PC in Cisco Packet Tracer to access the server at 192.168.1.11. The server successfully responds, displaying the default Cisco Packet Tracer welcome page with links. This verifies proper client-server communication and confirms that the server is running web services accessible to the client.

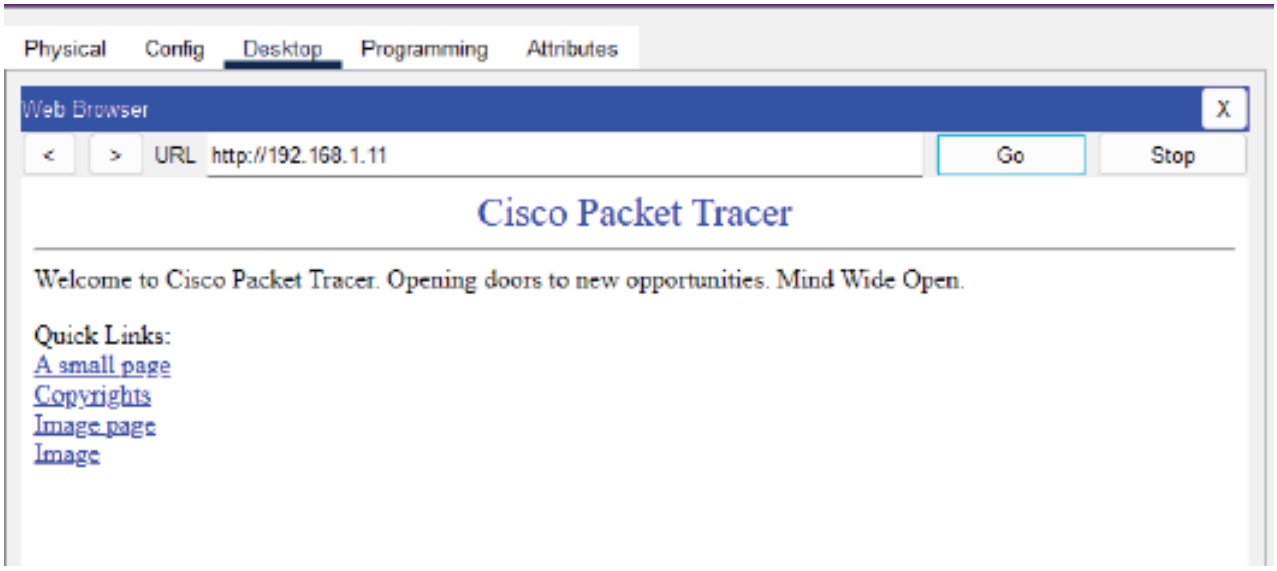


Figure 5: PC-to-Server Network via Router

This topology shows PC6 connected to a server (Server0) through a Cisco 1941 Router. The router is used here instead of a switch to provide inter-network communication between devices that may be in different subnets. This setup demonstrates how a router enables data transfer between a PC and a server at Layer 3 (Network Layer).

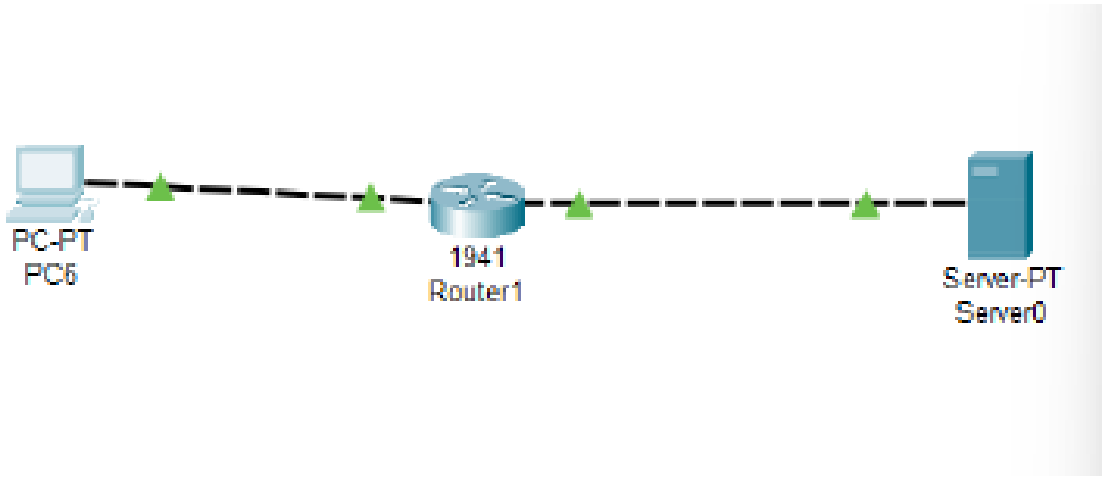
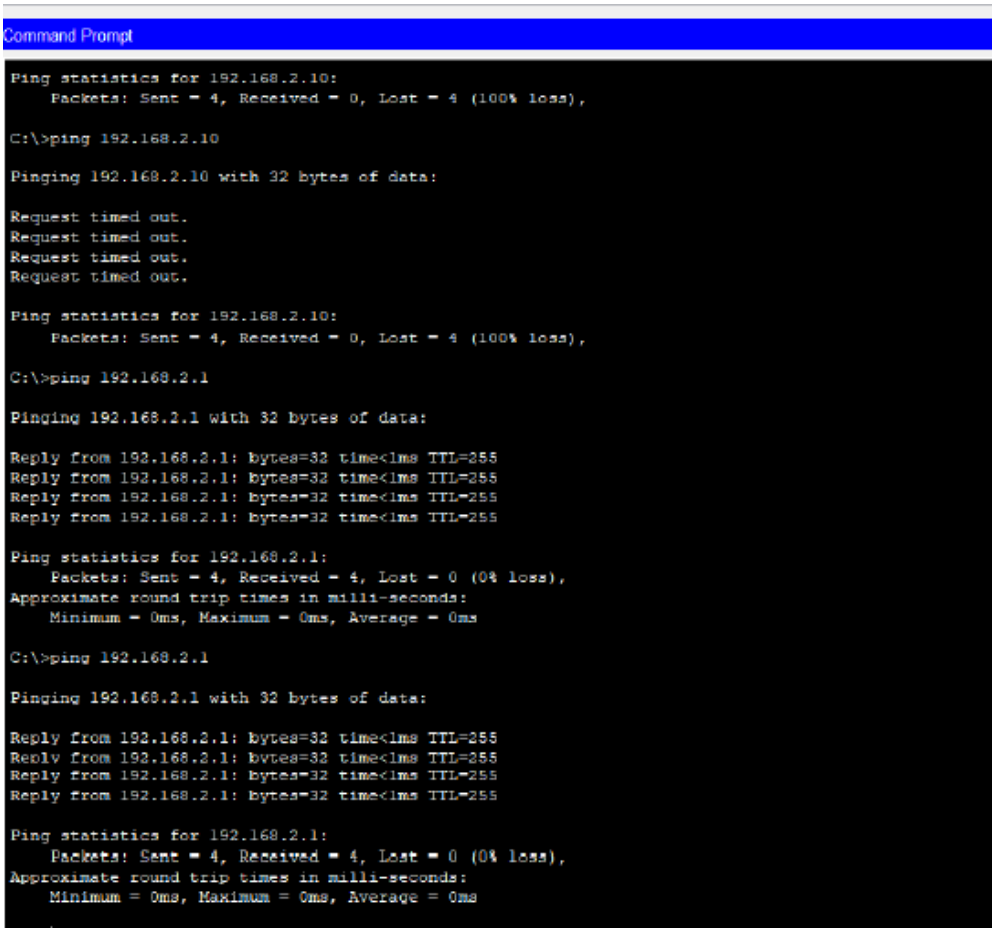


Figure 6: Ping Test Results with Router

The ping test shows that PC6 can reach the router successfully. This verifies router connectivity but highlights the need for further setup.



Conclusion

The experiment successfully demonstrated the design and configuration of a LAN using multiple network devices including switches, routers, PCs, and a server in Cisco Packet Tracer. By assigning correct static IP addresses, devices within the same subnet communicated seamlessly, as verified through successful ping tests. Additionally, browser-based access to the server confirmed the integration of application-level services. The use of a router highlighted the importance of inter-network connectivity, showing that proper configuration is required for communication across different subnets. Overall, the exercise validated key networking concepts such as static IP management, switch-based LAN communication, router-based inter-networking, and client-server interactions in a simulated environment.