Practical – 1

Aim of the Practical :- To study and execute the basic commands of Cisco Packet Tracer by configuring a simple peer-to-peer network and verifying connectivity using ping and tracert utilities. Additionally, to assign IP addresses manually and test end-to-end communication across devices. As an extension, configure static routes or subnetting to demonstrate inter-network communication.

Requirements :- PacketTracer, PC's, Ethernet cable, Switches and Routers.

Figure 1: Point-to-Point PC Connection

This figure shows a simple network in Cisco Packet Tracer where two PCs (PC0 and PC1) are directly connected with a cable. The green indicators confirm the link is active, allowing both systems to communicate.

Figure 2: IP Configuration and Connectivity Test

This figure shows CLI output in Cisco Packet Tracer. PC0 is assigned IP **192.168.1.10**, and it successfully pings PC1 (**192.168.1.20**). The traceroute shows a direct single-hop connection, confirming proper communication between the two PCs.

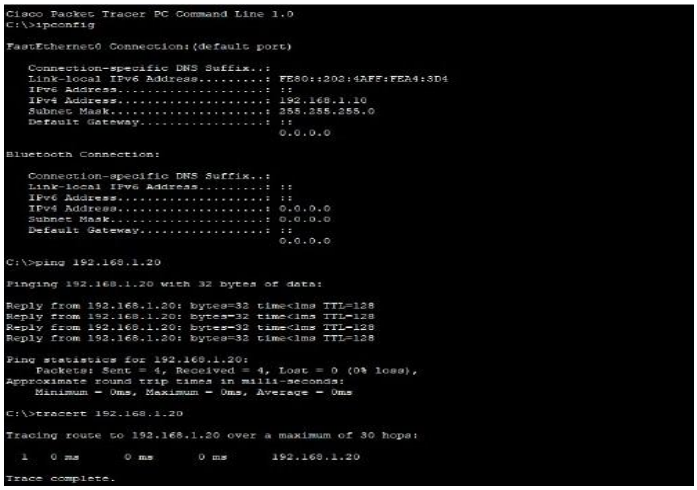

Figure 3: PCs Connected via Switch

This figure shows two PCs (PC0 and PC1) connected through a switch (2960-24TT) in Cisco Packet Tracer. The switch enables communication between the devices within the same network, making it a basic example of LAN connectivity.

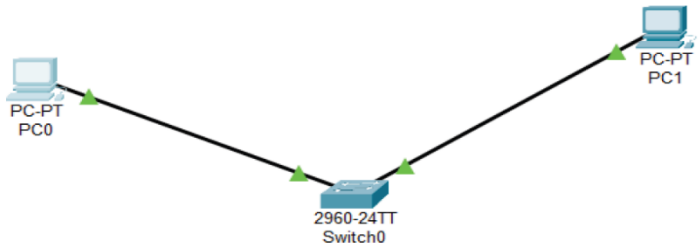

Figure 4: Ping and Traceroute Results

This figure shows CLI outputs of ping and traceroutes commands. PC0 successfully communicates with other devices (192.168.20.10 and 192.168.10.11). One ping test shows a packet loss, while the traceroute confirms the path through intermediate hops. The results verify end-to-end connectivity and network path checking.

```
Pinging 192.168.20.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>tracert 192.168.20.10

Tracing route to 192.168.20.10 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      192.168.10.1
  2    0 ms      0 ms      0 ms      192.168.20.10

Trace complete.

C:\>
C:\>ping 192.168.10.11

Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>tracert 192.168.10.11

Tracing route to 192.168.10.11 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      192.168.10.11

Trace complete.

C:\>
```

Figure 5: PCs Connected via Switches and Router

This figure shows four PCs connected using two switches and a router in Cisco Packet Tracer. The router enables communication between two different networks, while switches manage local connections within each network.

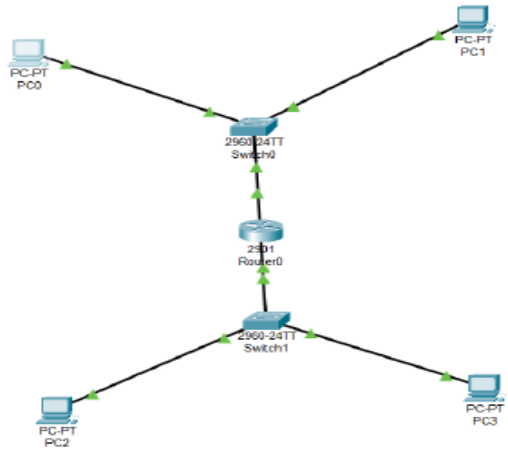

Figure 6: Ping and Traceroute Verification

This figure displays ping and traceroutes outputs. PC successfully pings devices in both networks. One ping shows minor packet loss, but traceroute confirms the data travels through the router between the two networks.

```
C:\>192.168.10.1
Invalid Command.

C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.10

Pinging 192.168.20.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127
Reply from 192.168.20.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>tracert 192.168.20.10

Tracing route to 192.168.20.10 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      192.168.10.1
  2    0 ms      0 ms      0 ms      192.168.20.10

Trace complete.
```

Conclusion:

The experiment successfully demonstrated fundamental networking concepts in Cisco Packet Tracer. Starting with direct peer-to-peer connectivity, manual IP configuration and verification were achieved using ping and tracert commands. The setup was then extended by introducing a switch, enabling LAN-based communication between devices. Finally, by incorporating a router, inter-network communication across multiple subnets was established, verifying proper routing functionality. The results confirm that basic network configuration, device interconnection, and communication verification were correctly implemented and validated through simulation.