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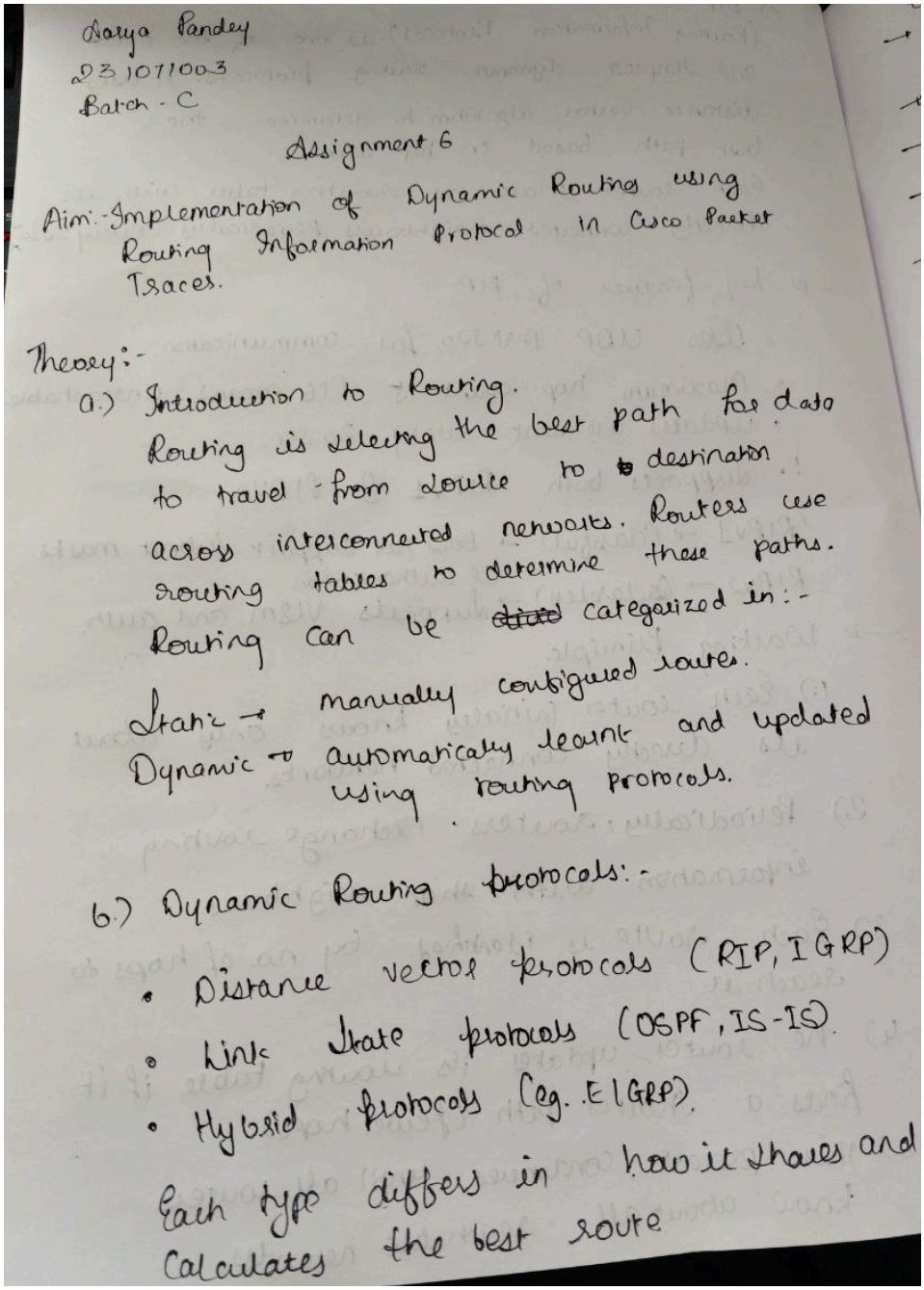
BATCH C

ASSIGNMENT 6



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Batch - C

Assignment 6

Aim:- Implementation of Dynamic Routing using Routing Information Protocol in Cisco Packet Tracer.

Theory:-

a.) Introduction to Routing.
Routing is selecting the best path for data to travel from source to destination across interconnected networks. Routers use routing tables to determine these paths.
Routing can be ~~divided~~ categorized in:-

Static → manually configured route.
Dynamic → automatically learnt and updated using routing protocols.

b.) Dynamic Routing protocols:-

- Distance vector protocols (RIP, IGRP)
- Link state protocols (OSPF, IS-IS)
- Hybrid protocols (eg. EIGRP)

Each type differs in how it shares and calculates the best route

1) RIP
(Routing Information Protocol) is one of the oldest and simplest dynamic routing protocols. It uses distance-vector algorithm to determine the best path based on hop count.
Each router shares its routing table with its directly connected neighbours periodically (every 30 sec).

→ Key features of RIP:
- Uses UDP Port 520 for communication.
- Maximum hop count = 15 (16 means unreachable)
- Updates are sent every 30 sec.
- Supports both RIPV1 & RIPV2

RIPv1 → (Classful) → Does not support subnet masks. Or authentication
RIPv2 → (Classless) → Supports VLSM and auth.

→ Working Principle.
1) Each router initially knows only about its directly connected networks.
2) Periodically, routers exchange routing information with their neighbours.
3) Each route is identified by no. of hops to reach it.
4) The router updates its routing table if it finds a shorter path (fewer hops).
5) This process continues until all routers know about all reachable networks.

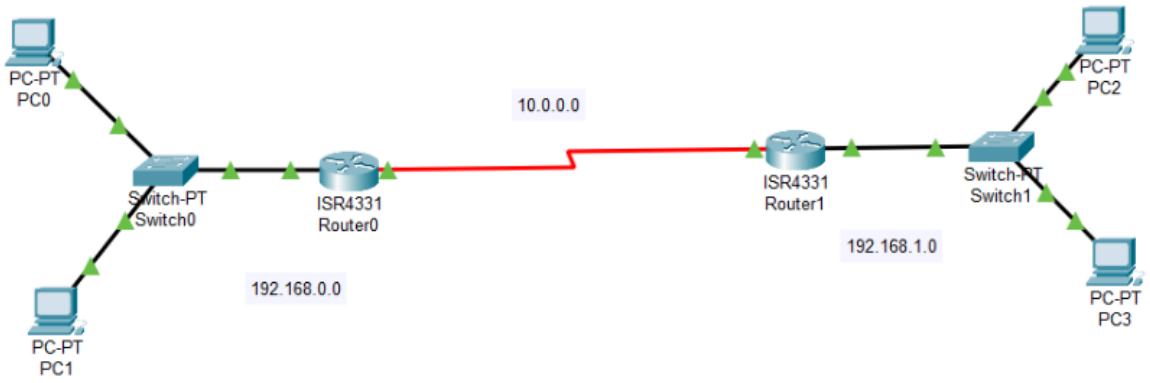
Advantages of RIP

- Easy to configure & maintain
- Automatically updates routing tables.
- Provides basic routing for small to medium networks.

Limitations of RIP.

- limited to 15 hops (not suitable for large networks)
- Slower convergence compared to protocols like OSPF or EIGRP.
- Periodic updates consume bandwith

Network Architecture



RIP routing at Router0

RIP Routing

Network

Add

Network Address
10.0.0.0
192.168.0.0

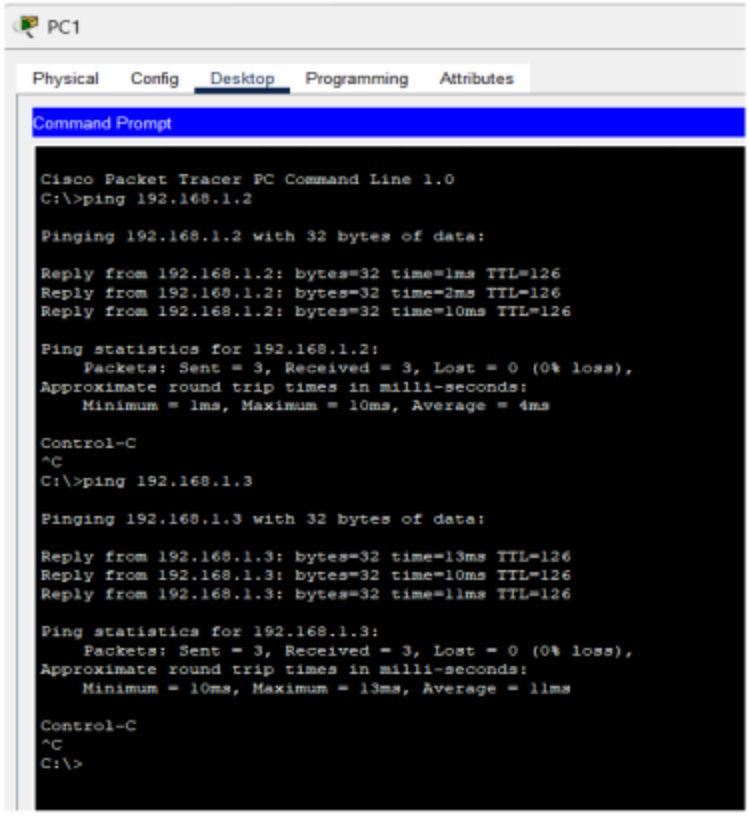
RIP routing at Router1

Output

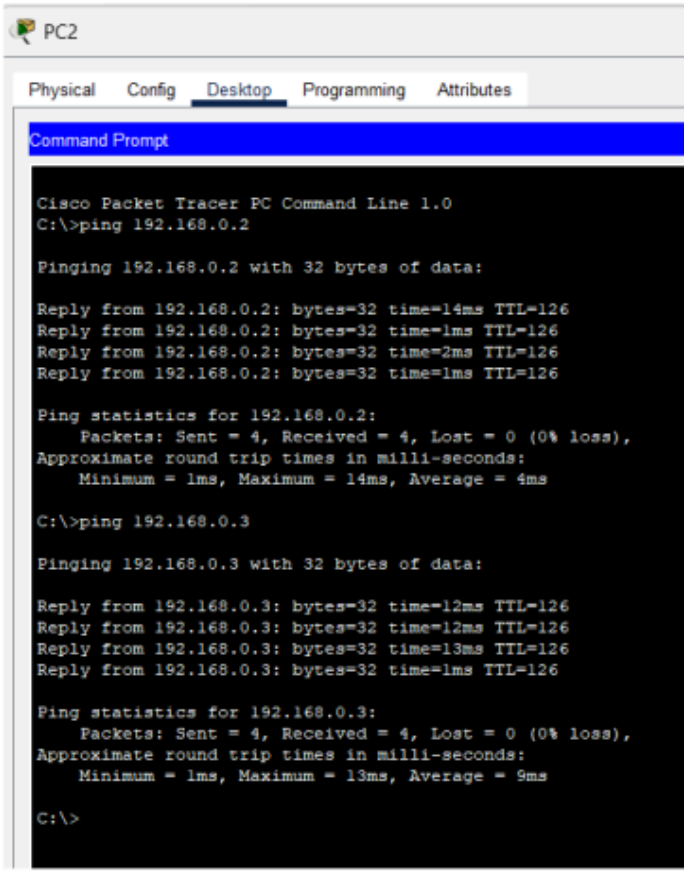
1) Ping PC2 and PC3 from PC0

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=11ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=13ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 13ms, Average = 11ms

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=15ms TTL=126
Reply from 192.168.1.3: bytes=32 time=10ms TTL=126
Reply from 192.168.1.3: bytes=32 time=10ms TTL=126
Reply from 192.168.1.3: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 15ms, Average = 11ms

C:\>
```

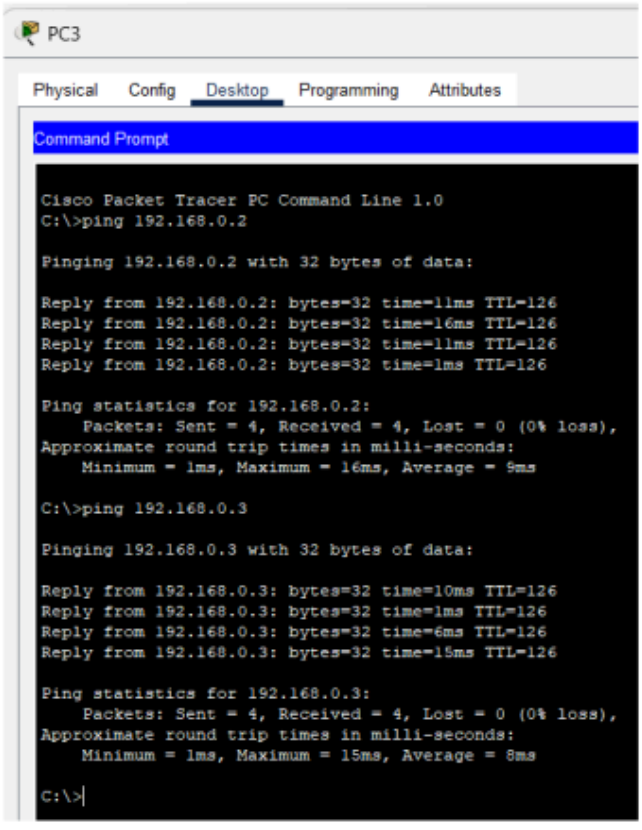
2) Ping PC2 and PC3 from PC1



3) Ping PC0 and PC1 from PC2



4) Ping PC0 and PC1 from PC3



CONCLUSION:

The network topology successfully demonstrates the use of RIP dynamic routing for inter-network communication. All routers learn routes dynamically, and connectivity between devices across different networks is verified through successful ping results. The simulation confirms that RIP operates as intended, ensuring efficient data transmission across the topology.