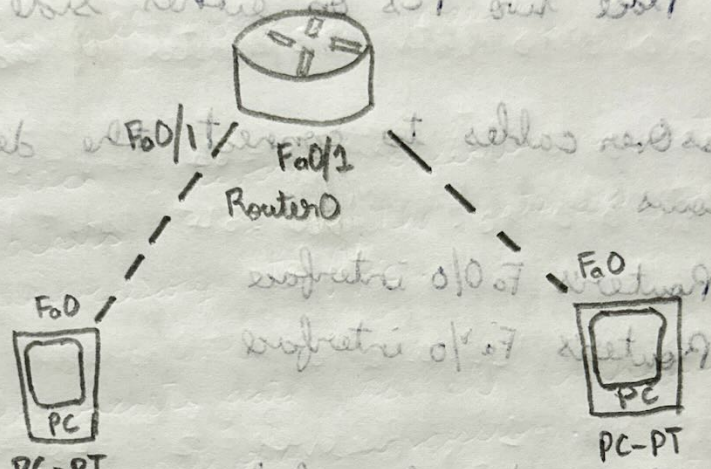
9-oct-24

Lab 2: Connecting two PCs on different networks using a router

Q) Configure IP address to routers in packet tracer. Explore the following messages: ping, response, destination, unreachable, request time out, reply

Aim: To configure a network with a router with two PCs connected using crossover cable, and to enable communication between them.

Topology:



1. PC0 : Connected to router's interface Fa 0/0 using a cross-over cable
   IP address: 10.0.0.10
   Default Gateway: 10.0.0.1

2. PC1: Connected to the router's interface Fa 1/0 using a cross over cable
   IP address: 20.0.0.10
   Default Gateway: 20.0.0.1

3. Router:
Interface Fa 0/0 connected to PC0
Interface Fa 1/0 connected to PC1
IP address of Fa 0/0 : 10.0.0.1
IP address of Fa 1/0 : 20.0.0.1

Procedure:

1. open ciscopacket tracer and drag the following components onto the workspace:
   - Router: Place on router in the middle
   - PCs: Place two PCs on either side of the router

2. Use Cross Over cables to connect the devices as follows:
   PC0 → Router's Fa0/0 interface
   PC1 → Router's Fa1/0 interface

3. Configure the router by clicking on the router and enter the CLI

Assign IP address to the router interface:

```
Router> enable
        configure terminal
        interface fastethernet 0/0
        ip address 10.0.0.1 255.0.0.0
        no shutdown
        exit
        interface fastethernet 1/0
        ip address 20.0.0.1 255.0.0.0
        no shutdown
```

4. Configure the PCs:

For PC0:
- click on PC0 and set the IP address to 10.0.0.10, subnet mask to 255.0.0.0 and default gateway to 10.0.0.1

For PC1:
- click on PC1 and set the IP Address to 20.0.0.10 subnet mask to 255.0.0.0 and default gateway to 20.0.0.1

5. Test Connectivity by opening the command prompt on PC0 & PC1
Use the ping command to check connectivity

From PC0, ping PC1's IP (20.0.0.10)
From PC1, ping PC0's IP (10.0.0.10)

Observation:

1. If the configuration and cabling are correct, you will receive successful ping replies b/w the two PCs

2. If there is no connectivity, troubleshoot by verifying: correct IP addressing, cabling type, both router interfaces are up & running.

Show IP route was observed to be:

Codes: C - connected, S - static, I-IGRP, R - RIP, M - Mobile, B - BGP, D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 - OSPF NSSA external type 1 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

* - candidate result , U - per-user static route , O - ODR
P - periodic download static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, Fast Ethernet 0/0
C 20.0.0.0/8 is directly connected, Fast Ethernet 0/1

ping from PC0 to PC1

> Ping 20.0.0.10

pinging 20.0.0.10 with 32 bytes of data:

Reply from 20.0.0.10: bytes = 64 time = 0ms TTL = 127
Reply from 20.0.0.10: bytes = 64 time = 1ms TTL = 127

Ping statistics for 20.0.0.10
Packets: Sent = 2 , Recieved = 2 , Lost = 0

approximate round trip times in milli-seconds:
Minimum = 0 , Maximum = 1ms , Average = 0ms

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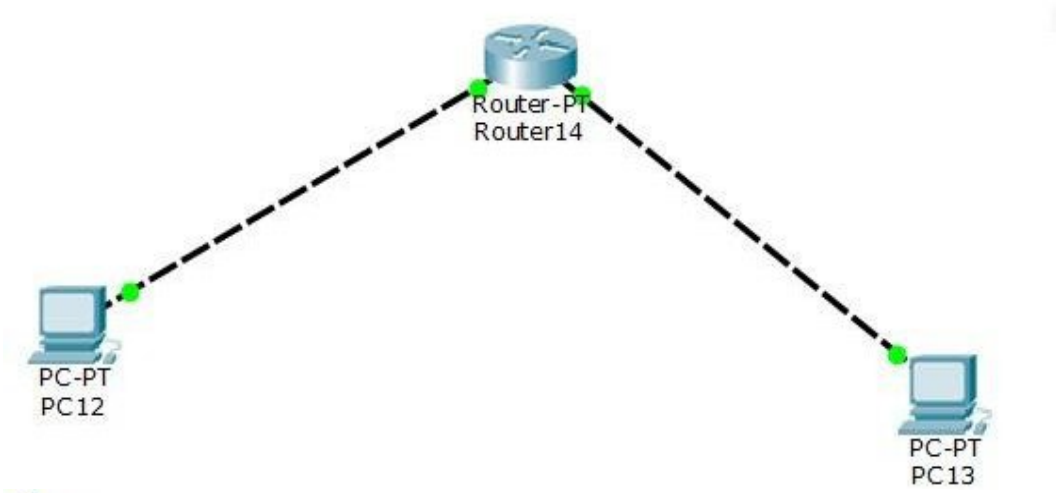
2) Configure IP address to routers in packet tracer. Explore the following messages: ping responses, destination unreachable, request timed out, reply



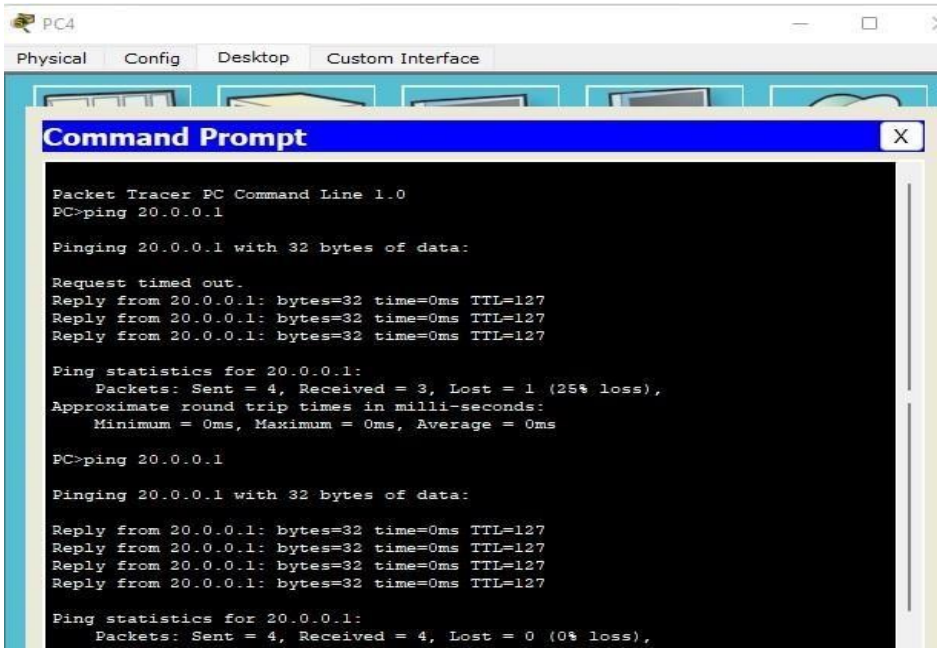
Router9

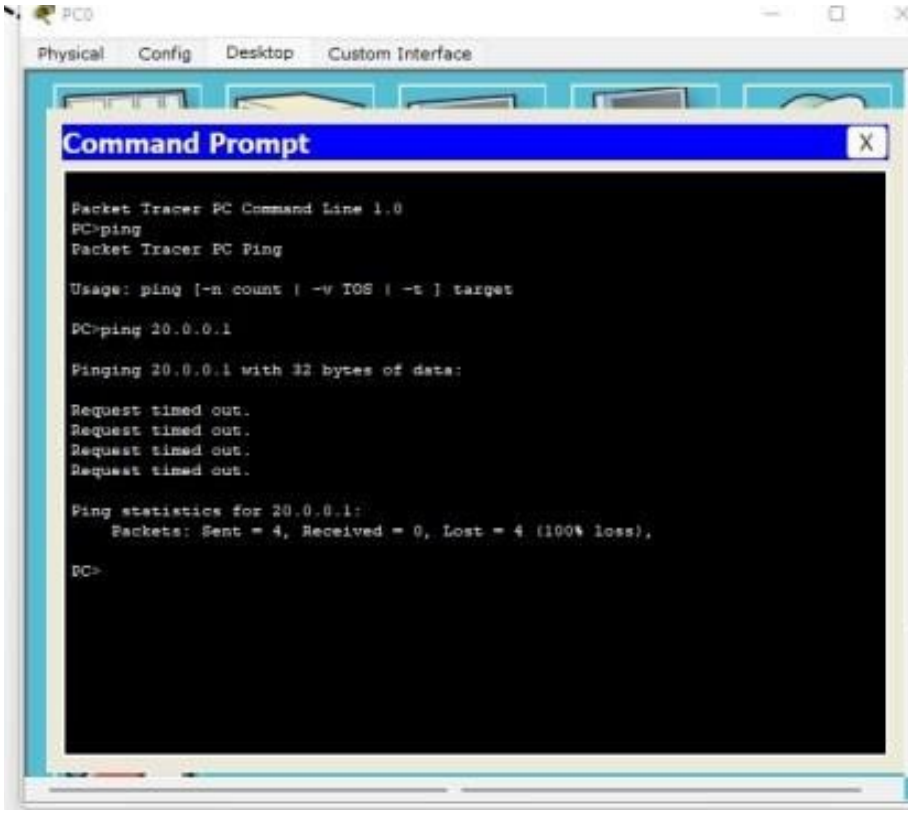
Physical Config CLI

IOS Command Line Interface

```
Router>config terminal
               ^
% Invalid input detected at '^' marker.

Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip address 10.0.0.2 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to
up

Router(config-if)#exit
Router(config)#interface fastEthernet 1/0
Router(config-if)#ip address 20.0.0.2 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to
up

Router(config-if)#exit
Router(config)#
```

Copy Paste





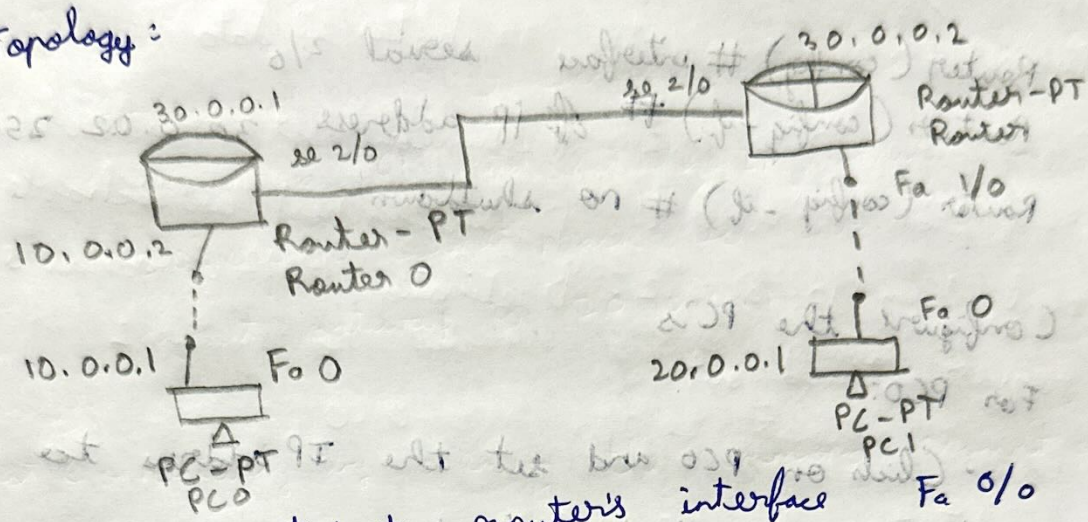
Observation:

16-Oct-24

Exp 2b

Aim: To connect two PC's on two networks via two routers

Topology:



1. PC0 - Connected to router's interface Fa 0/0 using a cross-over cable

IP address : 10.0.0.1

Default Gateway : 10.0.0.2

2. PC1 - connected to router's (Router 1) interface Fa 1/0 using a cross-over cable

IP address : 20.0.0.1

Default Gateway : 20.0.0.2

3. Router 0

- Interface Fa 0/0 connected to PC-0
- Interface Se 2/0 connected to Router-1
- IP address of Fa 0/0 : 10.0.0.2
- IP address of Se 2/0 : 30.0.0.1

Configure Router 1 similarly

Router > enable
Router # configure terminal
Router (config) # interface fast ethernet 1/0
Router (config-if) # ip address 20.0.0.2 255.0.0.0
Router (config-if) # exit

Router (config) # interface serial 2/0
Router (config-if) # ip address 30.0.0.2 255.0.0.0
Router (config-if) # no shutdown

5. Configure the PC's

For PC0:

- Click on PC0 and set the IP address to 10.0.0.1, subnet mask to 255.0.0.0 and default gateway to 10.0.0.2

For PC1:

- Click on PC1 and set the IP address to 20.0.0.1 subnet mask to 255.0.0.0 and default gateway to 20.0.0.2

Test connectivity by opening command prompt on PC0
Use the ping command to check connectivity from PC0, ping PC1's IP address (20.0.0.1)

Observation:
The configuration and cabling are correct, will receive successful ping replies b/w two PC's

4. Router 1:

- Interface Fa 1/0 connected to PC-1
- Interface Se 2/0 connected to Router 0
- IP address of Fa 1/0 : 20.0.0.2
- IP address of Se 2/0 : 30.0.0.2

Procedure:

- Open Cisco Packet tracer and drag the following components onto workspace:

  Router: Place two routers in the middle

  PC: Place two PCs on either side of the routers

- Use Cross-over cables to connect the devices as follows:

  PC0 → Router's(0) Fa 0/0 interface
  PC1 → Router's(1) Fa 1/0 interface

- Configure Router 0 by clicking on the router & enter CLI

  Assign IP addresses to the router interface:

  Router > enable
  Router (config) # interface fast ethernet 0/0
  Router (config-if) # ip address 10.0.0.2 255.0.0.0
  Router (config-if) # exit

  Router (config) # interface serial 2/0
  Router (config-if) # ip address 30.0.0.1 255.0.0.0
  Router (config-if) # no shutdown

  The ping results are as follows:

  PC > ping 20.0.0.1

  Pinging 20.0.0.1 with 32 bytes of data
  Request timed out
  Request timed out
  Request timed out
  Request timed out

Ping statistics for 20.0.0.1

Packet sent = 4, Received = 0, loss = 4 (100% loss)

PC> Ping 20.0.0.1

Pinging 20.0.0.1 with 32 bytes of data

reply from 10.0.0.2: Destination host unreachable

reply from 10.0.0.2: Destination host unreachable

reply from 10.0.0.2: Destination host unreachable

request timed out

Ping statistics for 20.0.0.1

Packet: sent = 4, received = 0, lost = 4

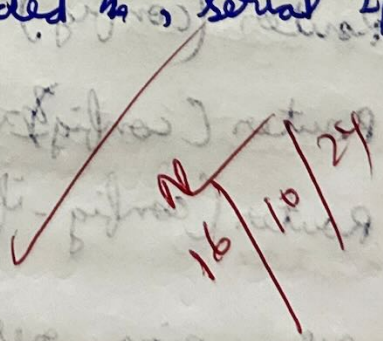
(100% loss)

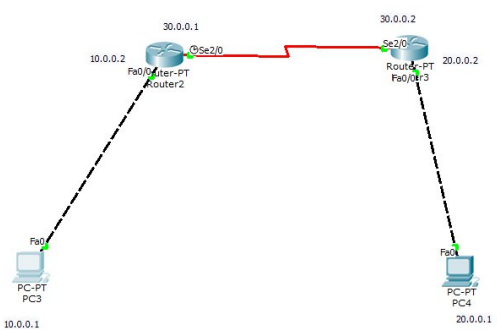
IP route was observed to be

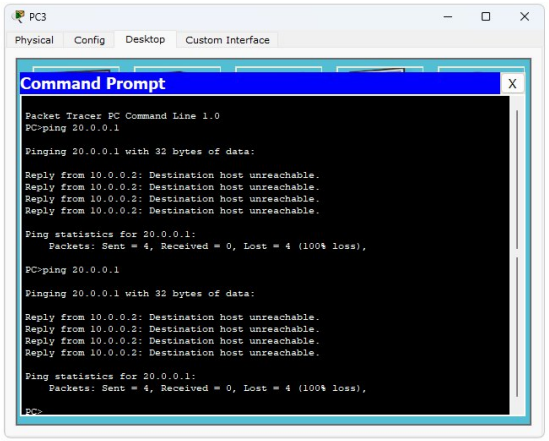
C 10.0.0.0/8 is directly connected, Fast Ethernet 0/0

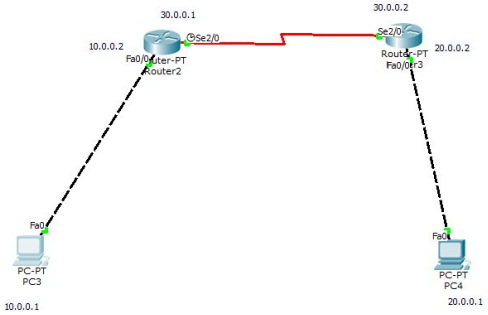
S 20.0.0.0/8 [1/0] via 30.0.0.2

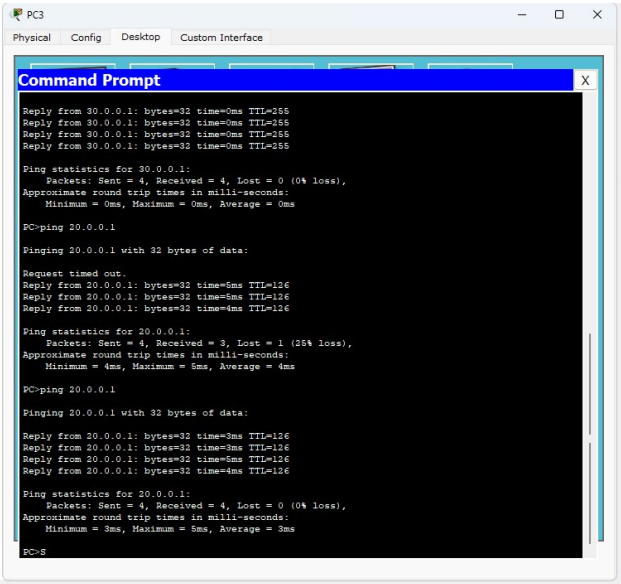
C 30.0.0.0/8 is directly connected, serial 2/0




30.0.0.1
30.0.0.2
10.0.0.2
Se2/0
Se2/0
20.0.0.2
Fa0/0
Router-PT
Router2
Router-PT
Fa0/0
Fa0/0
Fa0
PC-PT
PC3
PC-PT
PC4
10.0.0.1
20.0.0.1


PC3
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Reply from 10.0.0.2: Destination host unreachable.
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>


30.0.0.1
30.0.0.2
10.0.0.2
Se2/0
Se2/0
20.0.0.2
Fa0/0
Router-PT
Router2
Router-PT
Fa0/0
Fa0/0
Fa0
PC-PT
PC3
PC-PT
PC4
10.0.0.1
20.0.0.1


PC3
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Reply from 30.0.0.1: bytes=32 time=0ms TTL=255
Reply from 30.0.0.1: bytes=32 time=0ms TTL=255
Reply from 30.0.0.1: bytes=32 time=0ms TTL=255
Reply from 30.0.0.1: bytes=32 time=0ms TTL=255
Ping statistics for 30.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 20.0.0.1: bytes=32 time=5ms TTL=126
Reply from 20.0.0.1: bytes=32 time=5ms TTL=126
Reply from 20.0.0.1: bytes=32 time=4ms TTL=126
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 4ms, Maximum = 5ms, Average = 4ms
PC>ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data:
Reply from 20.0.0.1: bytes=32 time=3ms TTL=126
Reply from 20.0.0.1: bytes=32 time=3ms TTL=126
Reply from 20.0.0.1: bytes=32 time=5ms TTL=126
Reply from 20.0.0.1: bytes=32 time=4ms TTL=126
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 3ms, Maximum = 5ms, Average = 3ms
PC>S