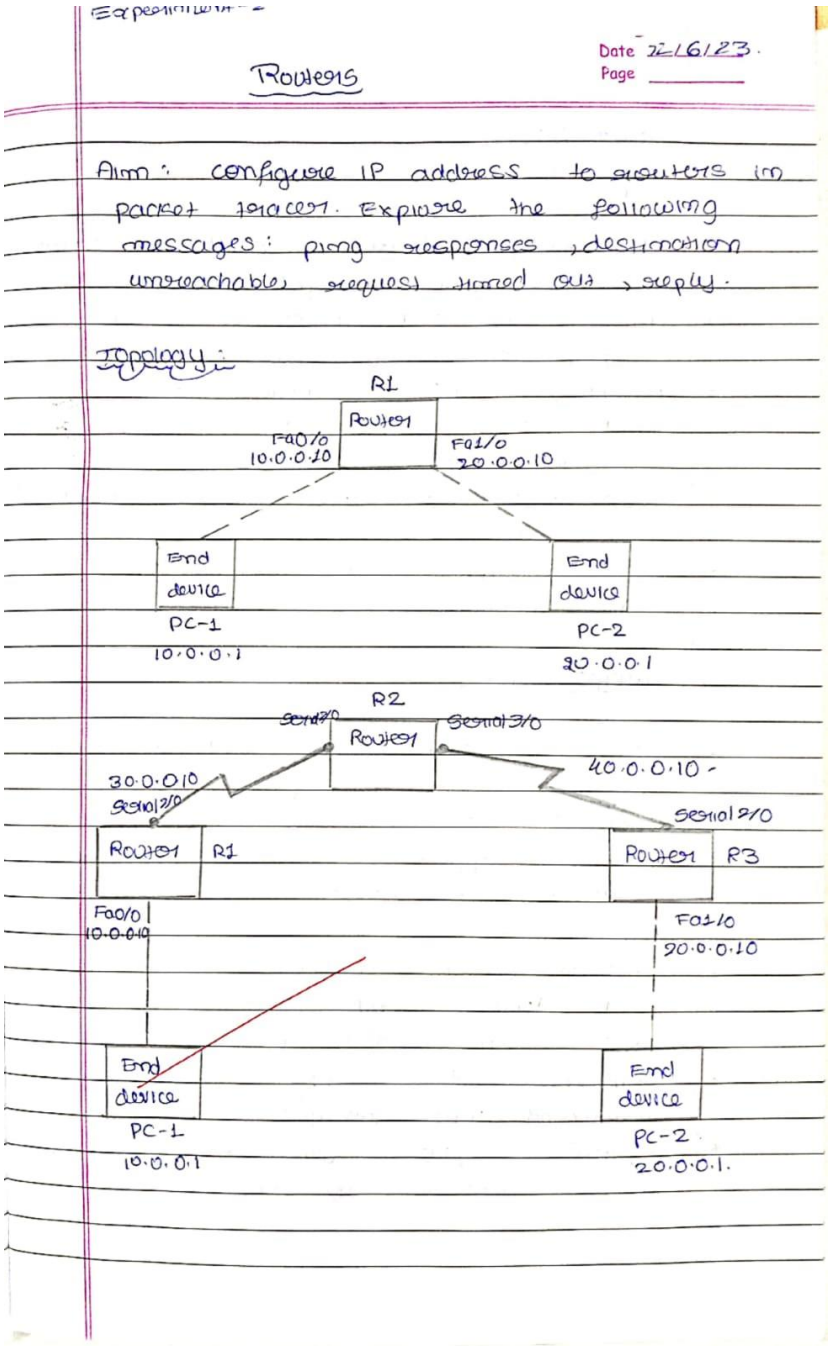
EXPERIMENT-2

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

Observation:



Procedure:

* Single router:

* Add two end devices and one router to the logical workspace.
* connect the end devices to router using copper cross-over connector.
* Assign unique IP address to each end device and also assign IP to the router gateways.
* configure the routers using command line interface.
* Ping a PDU from end device of one network to other.

* Multiple routers:

* Add two end devices and 3 routers to the logical workspace.
* connect the end devices to router using copper cross-over and connect routers to routers using serial connectors.
* Assign unique IP address to each end device and also assign IP to the router gateways.
* configure all of the routers using command line interface.
* ping a PDU from end device of one network to other.

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Result:

* Single router:

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=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=5ms TTL=127

Ping statistics for 20.0.0.1:
Packets: Sent=4, Received=3, Lost=1 (25% loss).
Approximate round trip times in milli-seconds:
Minimum=0ms, Maximum=5ms, Average=1ms.

* Multiple routers:

PC> ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:
Reply from 40.0.0.10: bytes=32 time=7ms TTL=254
Reply from 40.0.0.10: bytes=32 time=5ms TTL=254
Reply from 40.0.0.10: bytes=32 time=6ms TTL=254
Reply from 40.0.0.10: bytes=32 time=6ms TTL=254

Ping statistics for 40.0.0.10:
Packets: Sent=4, Received=4, Lost=0 (0% loss)
Approximate round trip time in milli-seconds:
Minimum=5ms, Maximum=7ms, Average=6ms.

Commands used to configure Router:

1. Enable
2. config t
3. interface <gateway port>
4. ip address <ip address> <subnet mask>
5. no shut
6. ip route <network ID> <subnet mask> <gateway>
7. no shut.

Observation on the equipment:

* A router is a hardware device which is used to connect a LAN with an internet connection. It is used to receive, analyze and forward the incoming packets to another network.
* A router forwards the packet based on the information available in the routing table.
* It determines the best path from the available paths for transmission of the packet.

* Result:

Before Routers have knowledge about entire network:

PC> ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.

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observation :

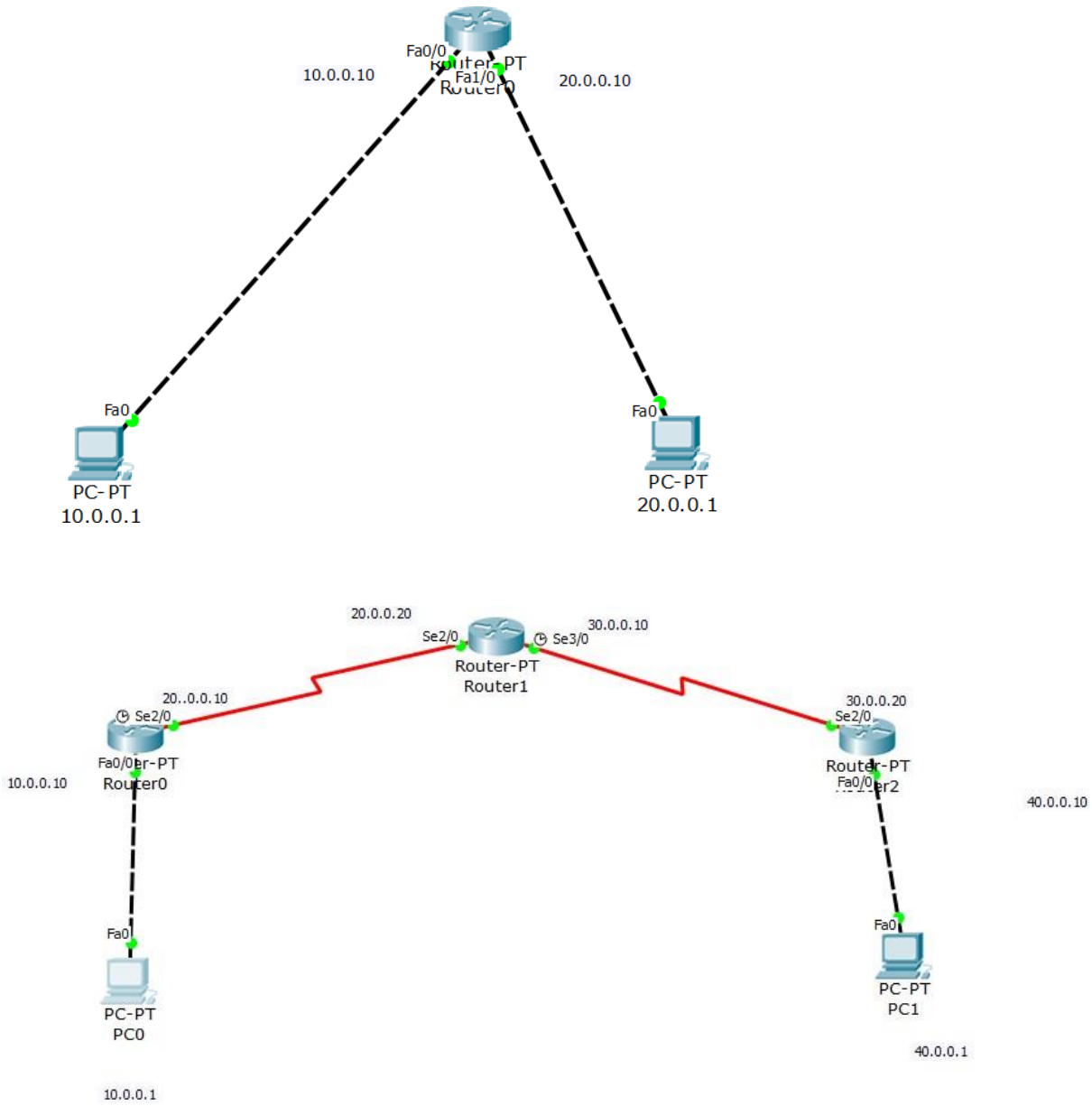
- PC-0 sends the data packet to router. Once the router receives a packet, it looks at it's IP address. The destination IP address tells the router the destination of the packet. The router has multiple ports it could send a packet along, and its goal is to send the packet to a router that's closer to its final destination. The packet then arrives at destination i.e. PC-1.

- Destination host unreachable : Implies that host we are trying to ping is down. It is happened because the router has no information about the destination end device on it's network. Router needs to be routed with the information of IP's of destination and it's network host.

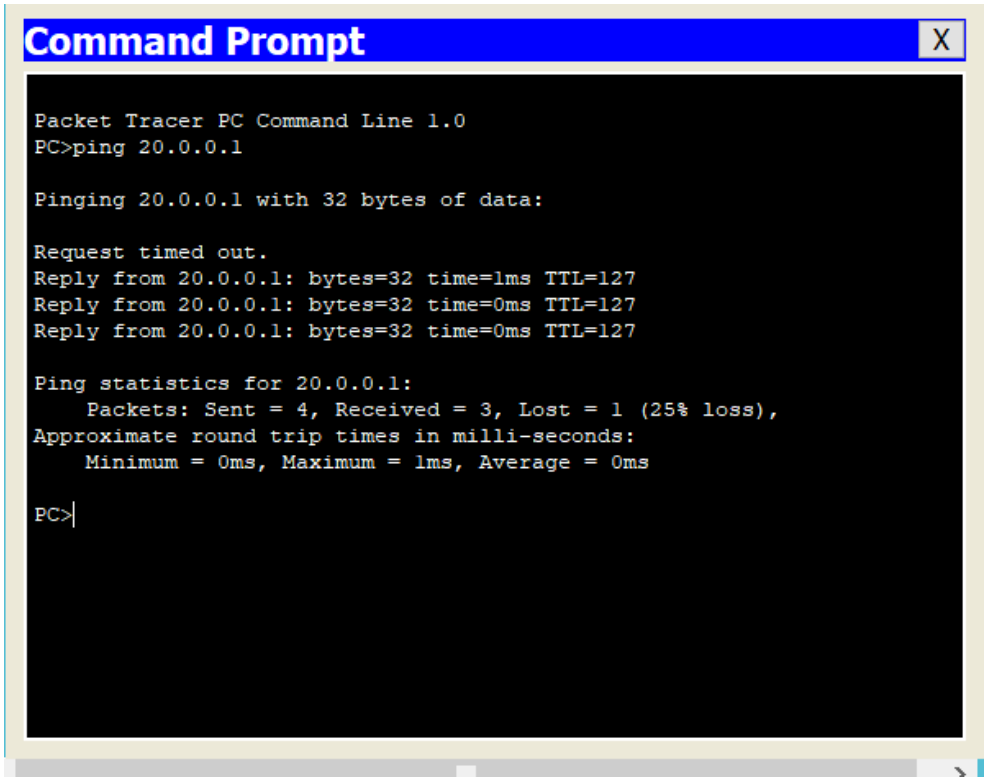
- Request timed out : Implies that ICMP packet reached from one host to other host but the reply could not reach the requesting host. This is due to the improper assignment of the gateways. There may be more packet loss on same physical issue.

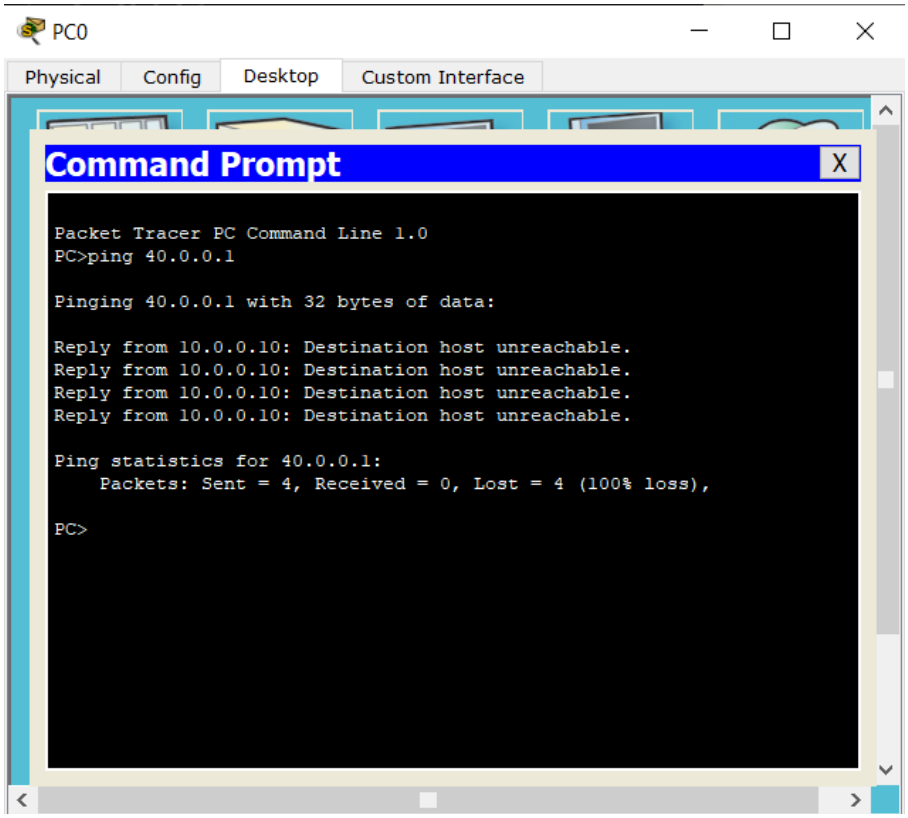
Static routing
communication

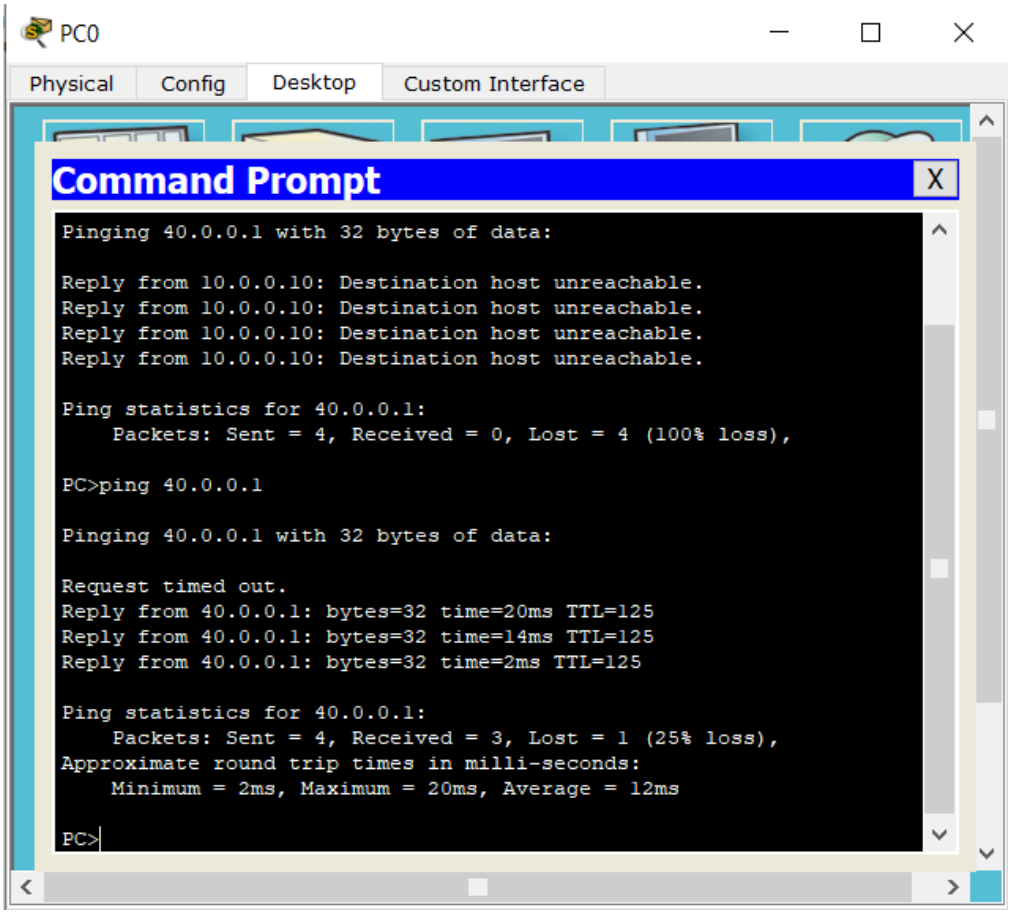
Topology:


Fa0/0
Fa1/0
10.0.0.10
20.0.0.10
Fa0
PC-PT
10.0.0.1
Fa0
PC-PT
20.0.0.1
20.0.0.20
Se2/0
Se3/0
30.0.0.10
Router-PT
Router1
20..0.0.10
Se2/0
Fa0/0
Router0
10.0.0.10
30.0.0.20
Se2/0
Fa0/0
40.0.0.10
Fa0
PC-PT
PC0
10.0.0.1
Fa0
PC-PT
PC1
40.0.0.1

Result:


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:
Request timed out.
Reply from 20.0.0.1: bytes=32 time=1ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Reply from 20.0.0.1: bytes=32 time=0ms TTL=127
Ping statistics for 20.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
PC>


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Pinging 40.0.0.1 with 32 bytes of data:
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Reply from 10.0.0.10: Destination host unreachable.
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 40.0.0.1: bytes=32 time=20ms TTL=125
Reply from 40.0.0.1: bytes=32 time=14ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Ping statistics for 40.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 20ms, Average = 12ms
PC>