

Experiment 2:

Single Router and Multi Router

Single Router

Aim: Demonstrate data transfer between two networks using a router. Configure default route and static route to the Router.

Topology:

```
graph TD
    Router[Router] --- PC0[PC0]
    Router --- PC1[PC1]
    subgraph EndDevices [end devices]
        PC0
        PC1
    end
```

Procedure:

- Place two end devices and a generic router on the logical interface.
- Connect the end ~~def~~ devices to the router using copper cross over wire.
- Configure different network ip for the end devices, and set the gateway accordingly.
- In order to set the ip address for different interfaces in the router through CLI, type the following commands.
 - > enable
 - > config t
 - > interface fastethernet 0/0
 - > ip address 10.0.0.10 255.0.0.0
 - > exit
 - > interface fastethernet 0/1
 - > ip address 20.0.0.10 255.0.0.0
 - > exit.

→ Now ping from one end device to another through command prompt.

Observation: It is observed that the ping message from ~~red~~ end device connected to network id 10 gets transmitted to the other end device connected to network id 20 through the router.

Output:

> 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 = 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 = 0ms, Average = 0ms

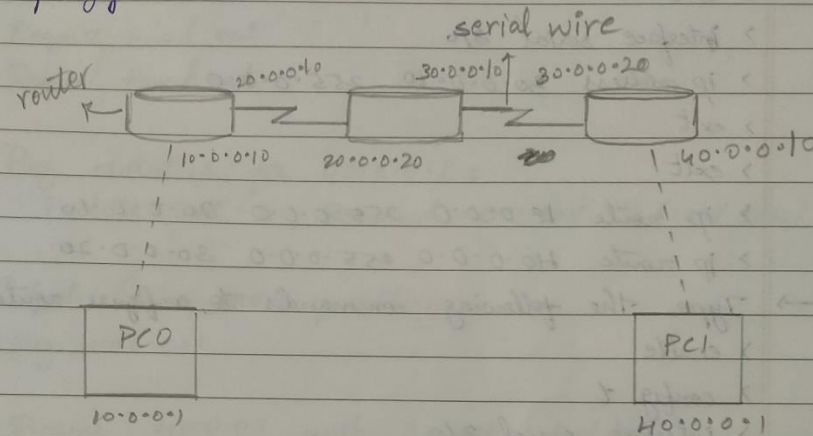
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Multi Router

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Aim: Demonstrate data transfer over multiple networks through routers. Configure default route and static route to the routers.

Topology:



Procedure:

- Place 2 end devices and 3 routers on the logical interface.
- Configure a network id of 10 with for PC0 and network id of 40 for PC1.
- Type the following commands to configure router0:
 - > enable
 - > config t
 - > interface fastEthernet 0/0
 - > ip address 10.0.0.10 255.0.0.0
 - > exit
 - > interface serial 2/0
 - > ip address 20.0.0.10 255.0.0.0
 - > exit
 - > exit
 - > ip route 30.0.0.0 255.0.0.0 20.0.0.20

Date _____
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```
> ip route 10.0.0.0 255.0.0.0 20.0.0.20
```

→ Type the following commands to configure router 1

```
> enable
```

```
> config t
```

```
> interface serial 2/0
```

```
> ip address 20.0.0.20 255.0.0.0
```

```
> exit
```

```
> interface serial 3/0
```

```
> ip address 30.0.0.10 255.0.0.0
```

```
> exit
```

```
> exit
```

```
> ip route 10.0.0.0 255.0.0.0 20.0.0.10
```

```
> ip route 10.0.0.0 255.0.0.0 30.0.0.20
```

→ Type the following commands to configure router 2

```
> enable
```

```
> config t
```

```
> interface serial 3/0
```

```
> ip address 30.0.0.20 255.0.0.0
```

```
> exit
```

```
> interface serial 2/0 fastEthernet 0/0
```

```
> ip address 20 40.0.0.10 255.0.0.0
```

```
> exit
```

```
> exit
```

```
> ip route 10.0.0.0 255.0.0.0 30.0.0.10
```

```
> ip route 20.0.0.0 255.0.0.0 30.0.0.10
```

→ Connect the routers through serial wise

→ Configure ip address and gateway on end devices.

→ ping message from one device to another

Output: (Before static ip routing)

> ping 40.0.0.1

Pinging with 40.0.0.1 with 32 bytes of data:

Request timed out

Request timed out

Request timed out

Request timed out

Ping statistics for 40.0.0.1:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss)

Output: (After static ip routing)

> ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Reply from 40.0.0.1: bytes=32 time=2ms TTL=125

Ping statistics for 40.0.0.1:

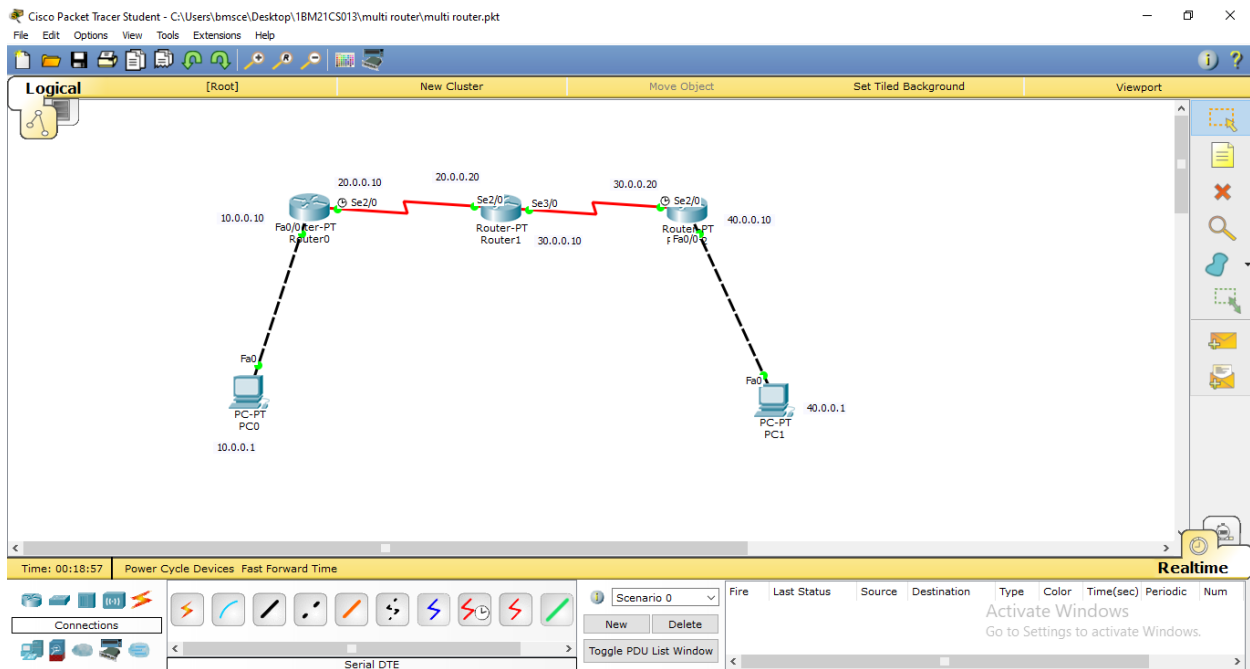
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milliseconds:

Minimum = 2ms, Maximum = 9ms, Average = 3ms.

Observation: The data packets gets transmitted across various networks through the routers with the help of static routing and direct routing.

Topology and output screenshots:



```
PC0
Physical Config Desktop Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.1
Pinging 40.0.0.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
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:
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=2ms TTL=125
Reply from 40.0.0.1: bytes=32 time=9ms TTL=125
Ping statistics for 40.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 9ms, Average = 3ms
PC>
```