

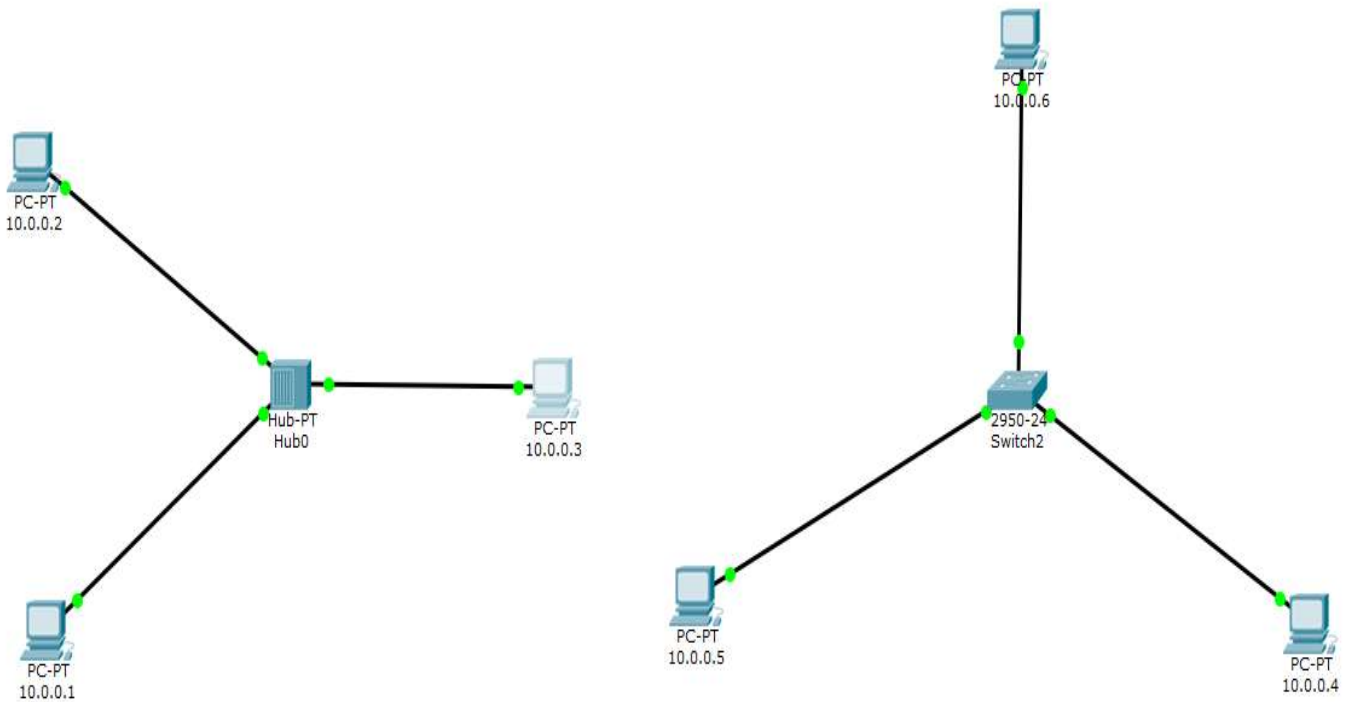
# **COMPUTER NETWORKS LAB**

**USN: 1BM21CS179**

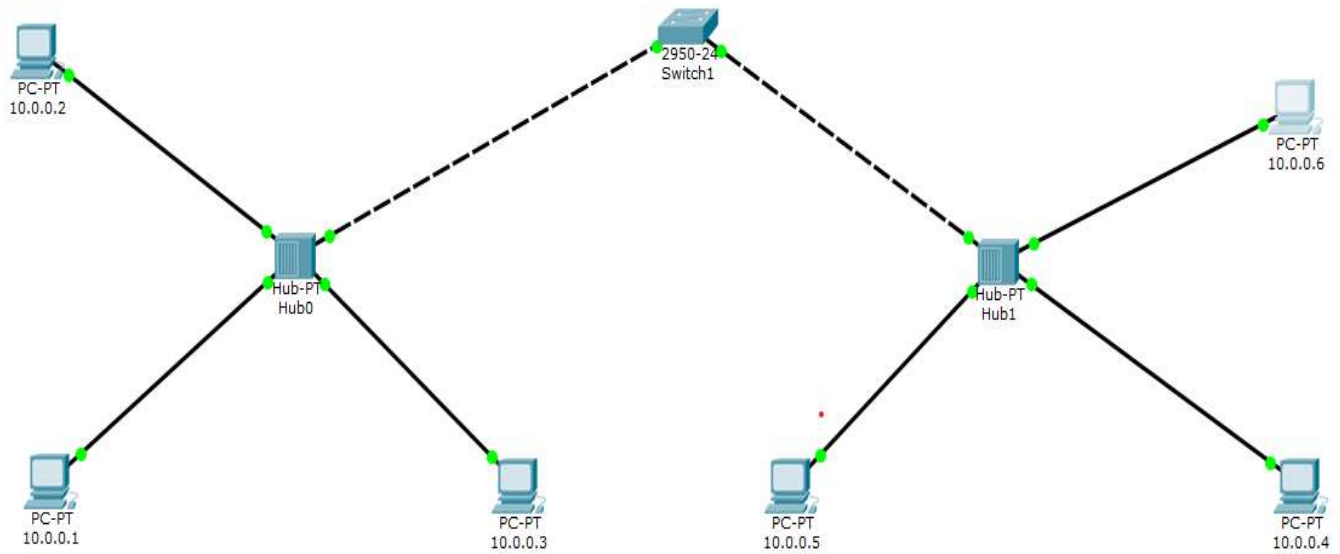
**WEEK 1:** (16-6-2023)

Create a topology consisting of 3 or devices connected with the help of a hub and switch. Simulate sending a simple PDU from source to destination.

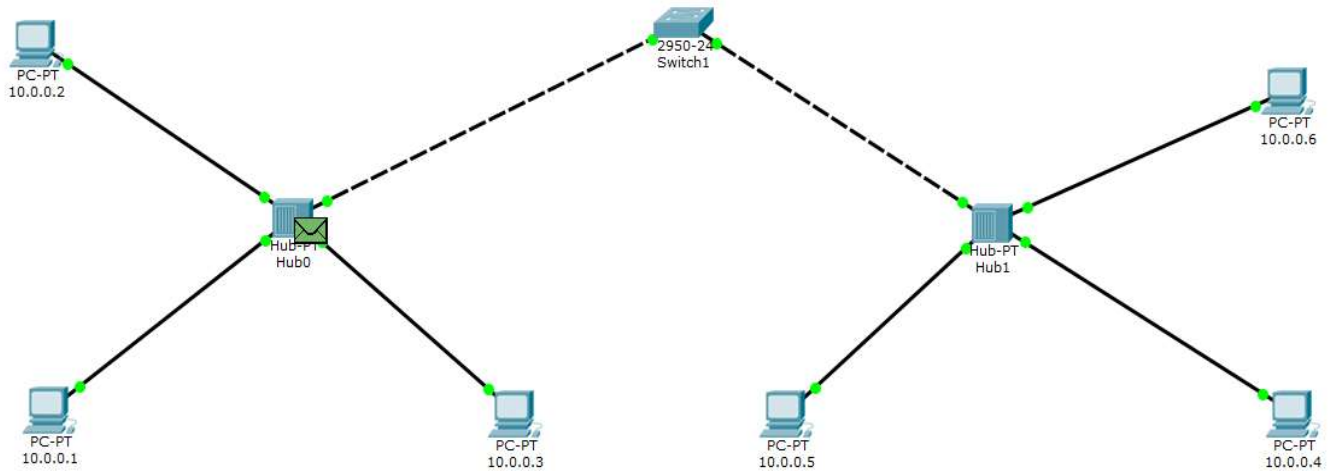
**Topology-1: (Hub and Switch)**

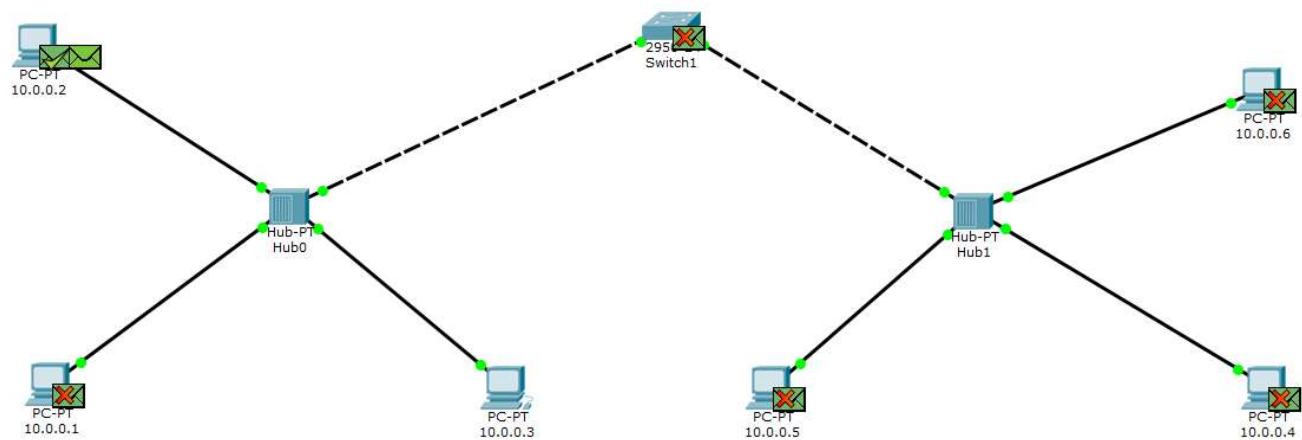


## Topology-2 (Hybrid Topology):



## Output:





Ping message:

```
Physical  Config  Desktop  Custom Interface

Command Prompt X

Packet Tracer PC Command Line 1.0
PC>ping 10.0.0.3

Pinging 10.0.0.3 with 32 bytes of data:

Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=0ms TTL=128
Reply from 10.0.0.3: bytes=32 time=4ms TTL=128
Reply from 10.0.0.3: bytes=32 time=4ms TTL=128

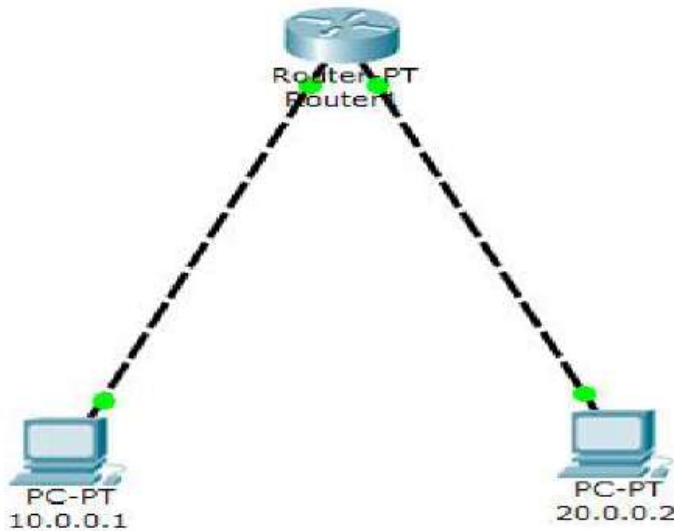
Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 2ms

PC>
```

## WEEK 2: (23-6-2023)

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

### Topology-1:



### Configuration Commands in CLI of Router:

```
Physical  Config  CLI

IOS Command Line Interface

Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: no

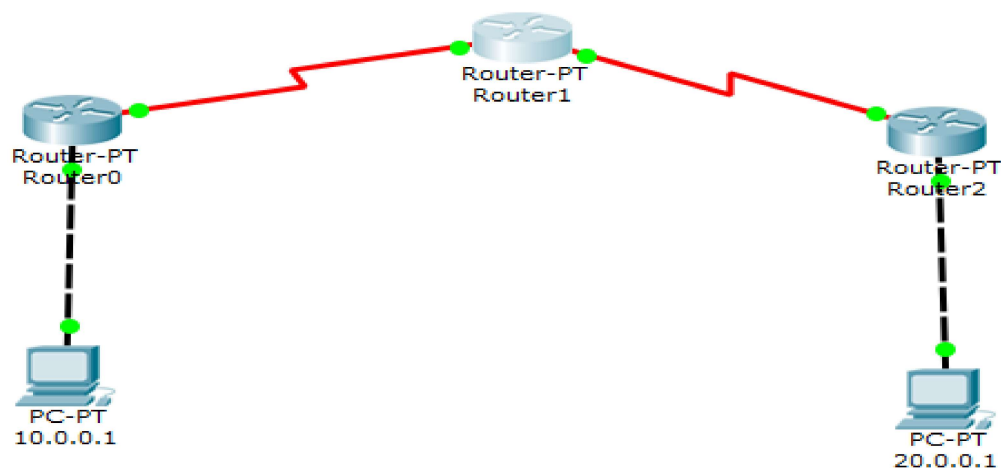
Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Fa0/0
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
```

## Topology-2:



## For Router 1:

```
--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Se2/0
Router(config-if)#
Router(config-if)#ip address 30.0.0.2 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router(config-if)#exit
Router(config)#interface Se3/0
Router(config-if)#ip address 40.0.0.2 255.0.0.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

## For Router 2:

```
--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

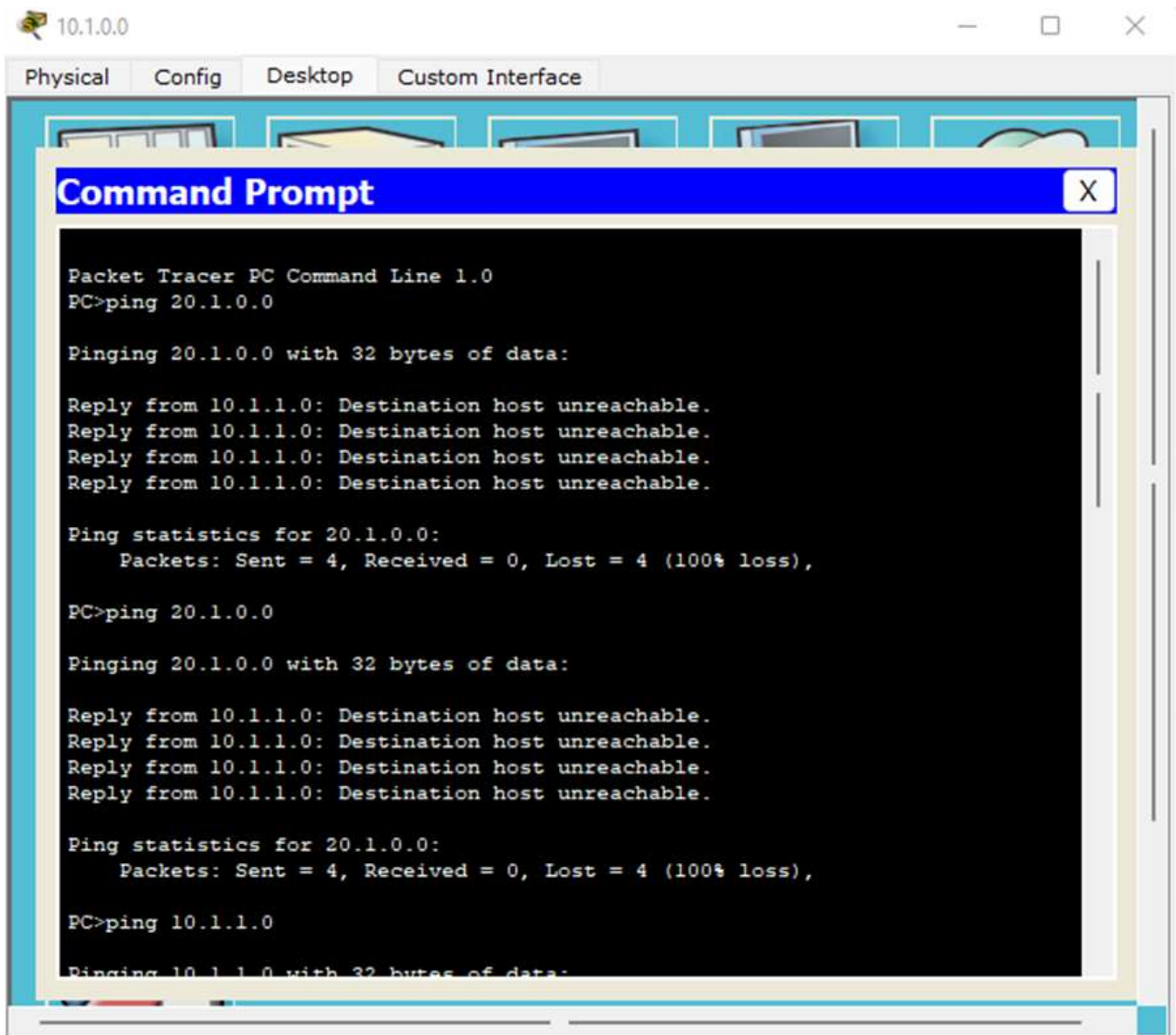
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.0.0.2 255.0.0.0
Router(config-if)#no shutdown

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)#
```

## Output:



The screenshot shows a Packet Tracer PC Command Line window for a device named 10.1.0.0. The window has tabs for Physical, Config, Desktop, and Custom Interface. The Desktop tab is active, displaying a Command Prompt window. The Command Prompt shows the results of two ping commands: 'ping 20.1.0.0' and 'ping 10.1.1.0'. Both commands result in 100% loss of packets, with the message 'Destination host unreachable' for each of the four attempts.

```
Packet Tracer PC Command Line 1.0
PC>ping 20.1.0.0

Pinging 20.1.0.0 with 32 bytes of data:

Reply from 10.1.1.0: Destination host unreachable.
Reply from 10.1.1.0: Destination host unreachable.
Reply from 10.1.1.0: Destination host unreachable.
Reply from 10.1.1.0: Destination host unreachable.

Ping statistics for 20.1.0.0:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 20.1.0.0

Pinging 20.1.0.0 with 32 bytes of data:

Reply from 10.1.1.0: Destination host unreachable.
Reply from 10.1.1.0: Destination host unreachable.
Reply from 10.1.1.0: Destination host unreachable.
Reply from 10.1.1.0: Destination host unreachable.

Ping statistics for 20.1.0.0:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 10.1.1.0

Pinging 10.1.1.0 with 32 bytes of data:
```

10.1.0.0

Physical Config Desktop Custom Interface

## Command Prompt

```
PC>ping 10.1.1.0
```

```
Pinging 10.1.1.0 with 32 bytes of data:
```

```
Reply from 10.1.1.0: bytes=32 time=0ms TTL=255
```

```
Reply from 10.1.1.0: bytes=32 time=0ms TTL=255
```

```
Reply from 10.1.1.0: bytes=32 time=0ms TTL=255
```

```
Reply from 10.1.1.0: bytes=32 time=0ms TTL=255
```

```
Ping statistics for 10.1.1.0:
```

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

```
Approximate round trip times in milli-seconds:
```

```
Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
PC>ping 30.1.1.0
```

```
Pinging 30.1.1.0 with 32 bytes of data:
```

```
Request timed out.
```

```
Request timed out.
```

```
Request timed out.
```

```
Request timed out.
```

```
Ping statistics for 30.1.1.0:
```

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

```
PC>ping 30.1.0.0
```

10.1.0.0

Physical Config Desktop Custom Interface

## Command Prompt

X

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

PC>ping 30.1.0.0

Pinging 30.1.0.0 with 32 bytes of data:

Reply from 30.1.0.0: bytes=32 time=0ms TTL=255

Reply from 30.1.0.0: bytes=32 time=0ms TTL=255

Reply from 30.1.0.0: bytes=32 time=0ms TTL=255

Reply from 30.1.0.0: bytes=32 time=0ms TTL=255

Ping statistics for 30.1.0.0:

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

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 40.1.0.0

Pinging 40.1.0.0 with 32 bytes of data:

Reply from 10.1.1.0: Destination host unreachable.

Request timed out.

Reply from 10.1.1.0: Destination host unreachable.

Reply from 10.1.1.0: Destination host unreachable.

Ping statistics for 40.1.0.0:

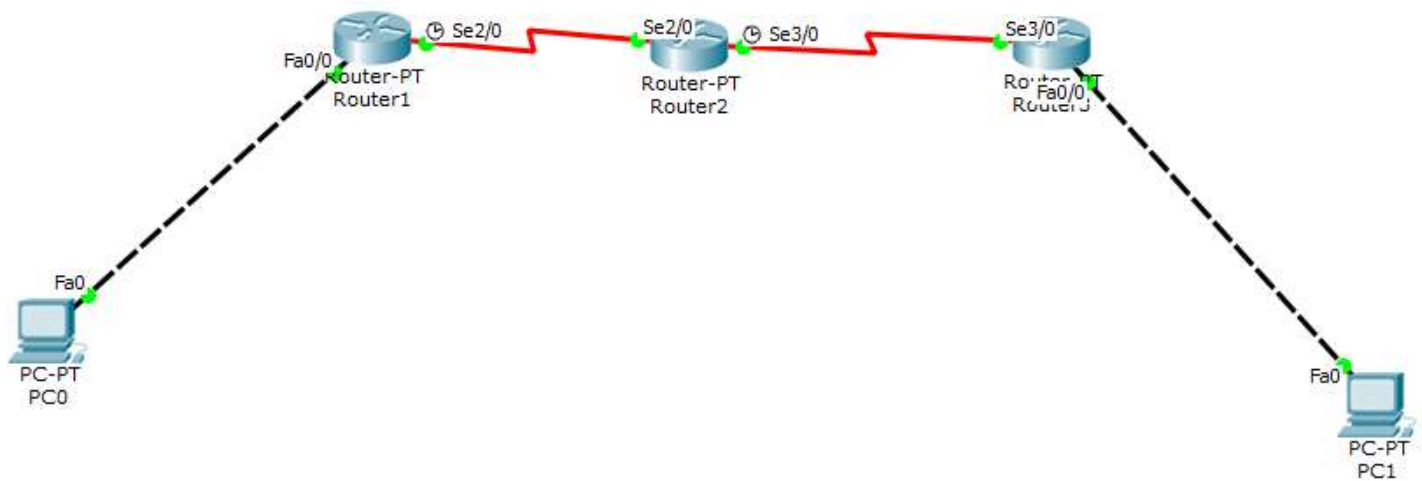
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>

### WEEK-3: (30-06-23)

Configure default route,static route to the Router.

#### TOPOLOGY:



*For static routing of (Router 1):*

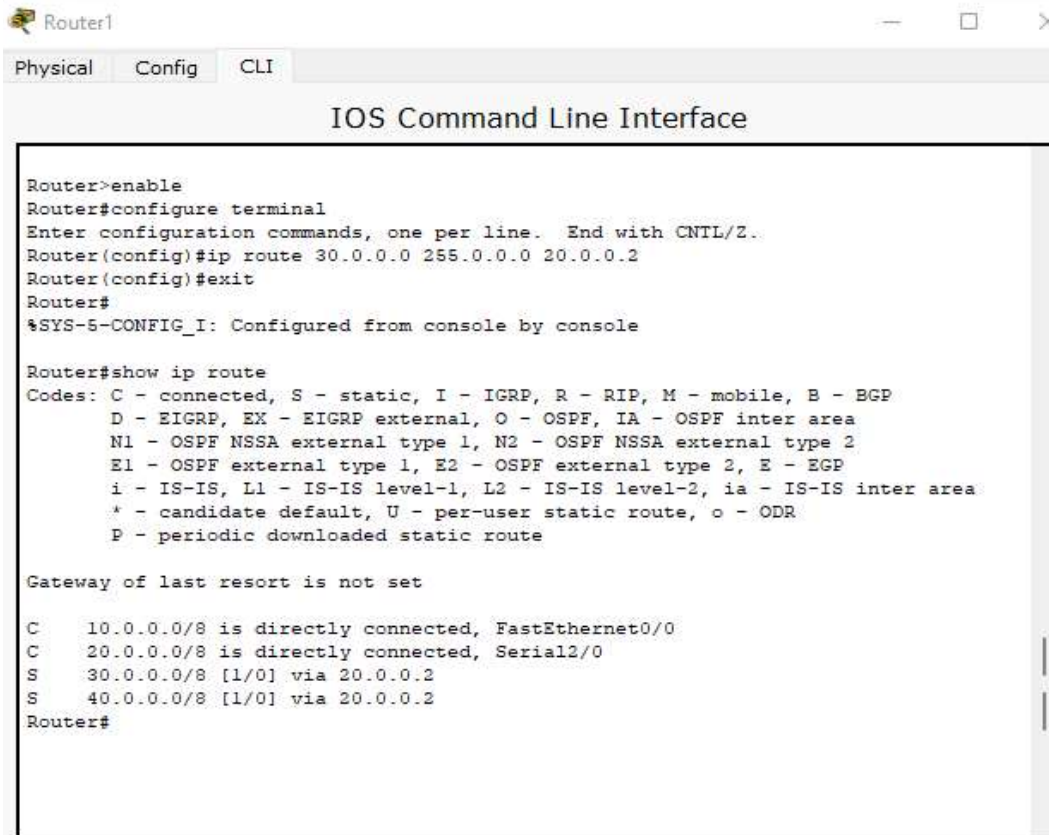
```
Router>enable
Router #configure terminal
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
Router(config)#ip route 40.0.0.0 255.0.0.0 20.0.0.2
Router(config)#exit
```

*For default routing of (Router 1):*

```
Router>enable
Router #configure terminal
Router(config)#ip route 0.0.0.0 0.0.0.0 20.0.0.2
Router(config)#ip route 0.0.0.0 0.0.0.0 20.0.0.2
Router(config)#exit
```

After static routing of all 3 routers:

Router 1:



```
Router1
Physical Config CLI
IOS Command Line Interface

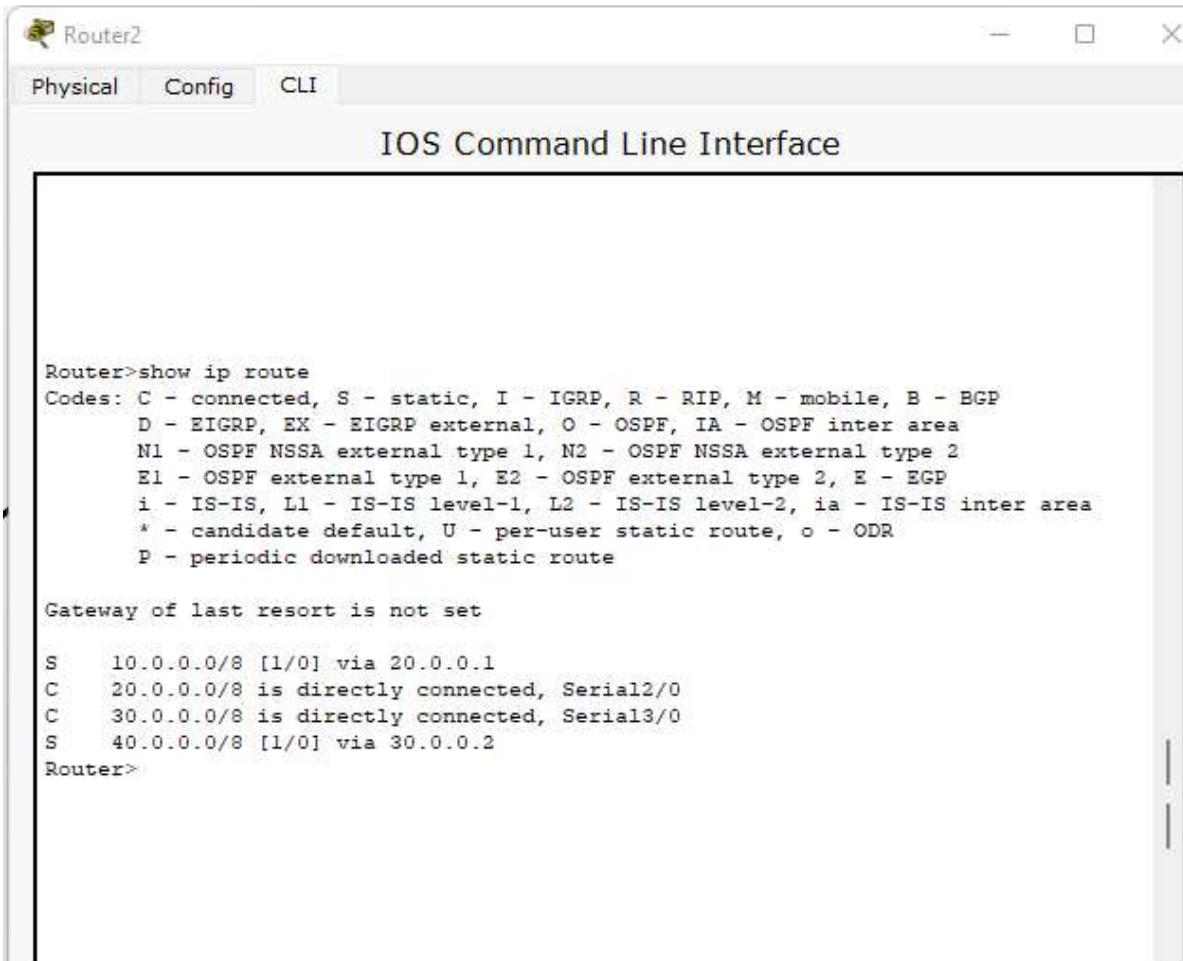
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
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, N2 - OSPF NSSA external type 2
       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 default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    20.0.0.0/8 is directly connected, Serial2/0
S    30.0.0.0/8 [1/0] via 20.0.0.2
S    40.0.0.0/8 [1/0] via 20.0.0.2
Router#
```

## Router 2:



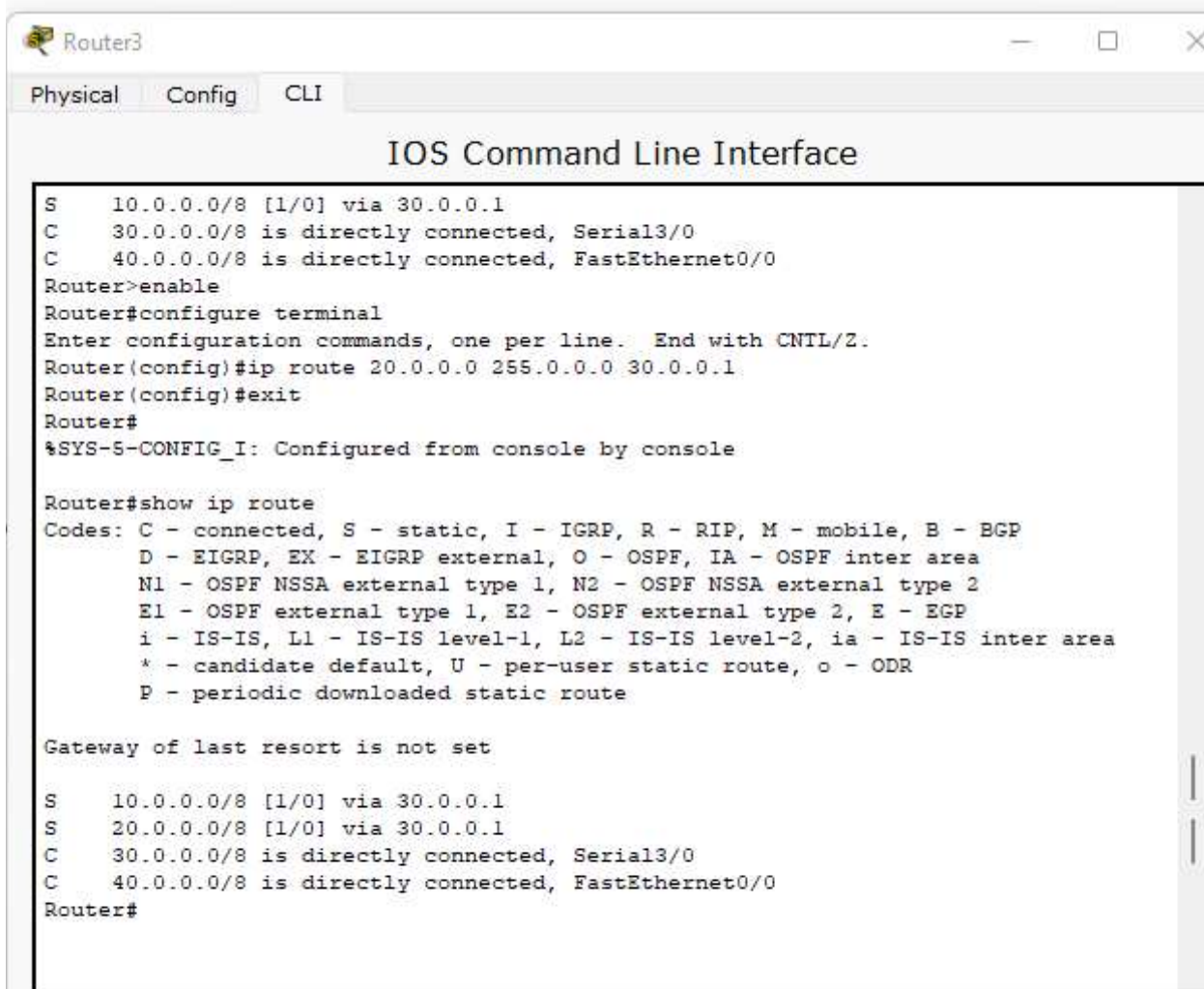
The screenshot shows a window titled "Router2" with three tabs: "Physical", "Config", and "CLI". The "CLI" tab is active, displaying the "IOS Command Line Interface". The command "Router>show ip route" has been entered, and the output is displayed. The output includes a legend for route codes, a message about the default gateway, and a list of four routes: a static route to 10.0.0.0/8 via 20.0.0.1, and two directly connected routes for 20.0.0.0/8 and 30.0.0.0/8 on Serial2/0 and Serial3/0 respectively, followed by another static route to 40.0.0.0/8 via 30.0.0.2.

```
Router>show ip route
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, N2 - OSPF NSSA external type 2
       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 default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

S    10.0.0.0/8 [1/0] via 20.0.0.1
C    20.0.0.0/8 is directly connected, Serial2/0
C    30.0.0.0/8 is directly connected, Serial3/0
S    40.0.0.0/8 [1/0] via 30.0.0.2
Router>
```

### Router 3:



The screenshot shows a window titled "Router3" with three tabs: "Physical", "Config", and "CLI". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

```
S 10.0.0.0/8 [1/0] via 30.0.0.1
C 30.0.0.0/8 is directly connected, Serial3/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 20.0.0.0 255.0.0.0 30.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
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, N2 - OSPF NSSA external type 2
       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 default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

S 10.0.0.0/8 [1/0] via 30.0.0.1
S 20.0.0.0/8 [1/0] via 30.0.0.1
C 30.0.0.0/8 is directly connected, Serial3/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

## Ping message:

```
PC>ping 20.0.0.2

Pinging 20.0.0.2 with 32 bytes of data:

Reply from 20.0.0.2: bytes=32 time=1ms TTL=254
Reply from 20.0.0.2: bytes=32 time=5ms TTL=254
Reply from 20.0.0.2: bytes=32 time=1ms TTL=254
Reply from 20.0.0.2: bytes=32 time=5ms TTL=254

Ping statistics for 20.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 5ms, Average = 3ms

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=7ms TTL=125
Reply from 40.0.0.1: bytes=32 time=9ms 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 = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 9ms, Average = 8ms

PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Reply from 40.0.0.2: bytes=32 time=9ms TTL=253
Reply from 40.0.0.2: bytes=32 time=9ms TTL=253
Reply from 40.0.0.2: bytes=32 time=9ms TTL=253
Reply from 40.0.0.2: bytes=32 time=7ms TTL=253

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 9ms, Average = 8ms

PC>ping 30.0.0.1

Pinging 30.0.0.1 with 32 bytes of data:

Reply from 30.0.0.1: bytes=32 time=5ms TTL=254
Reply from 30.0.0.1: bytes=32 time=4ms TTL=254
Reply from 30.0.0.1: bytes=32 time=4ms TTL=254
Reply from 30.0.0.1: bytes=32 time=2ms TTL=254

Ping statistics for 30.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 5ms, Average = 3ms
```