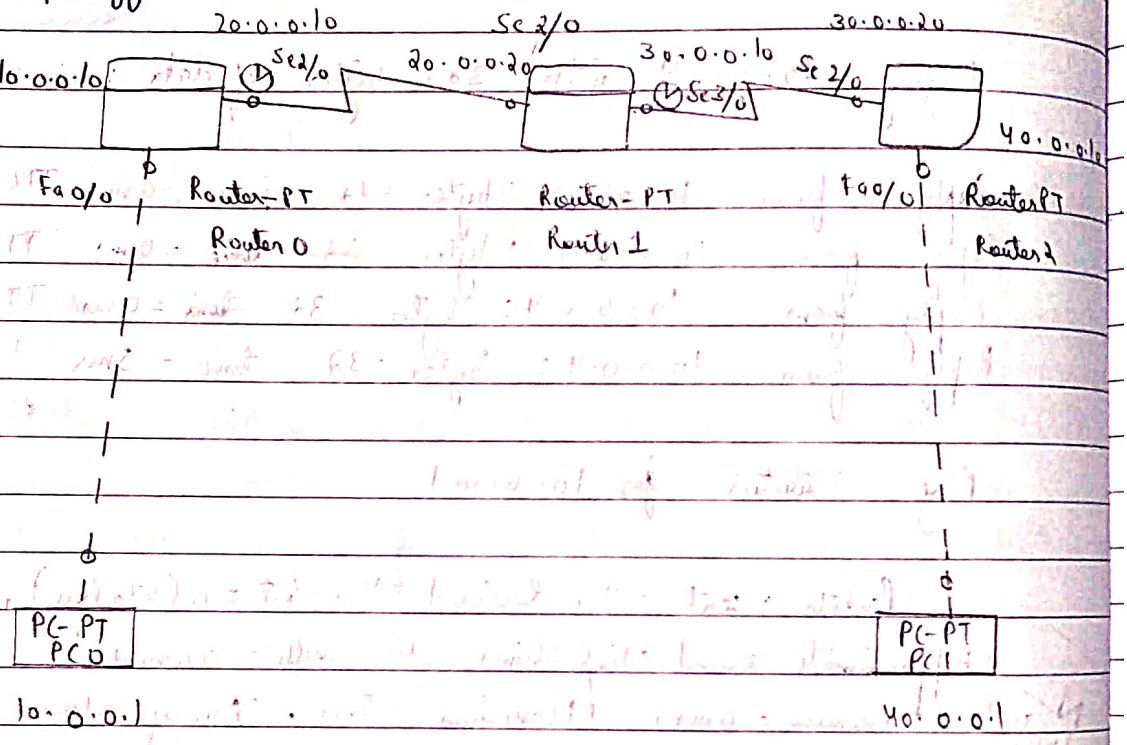
Lab: Week 5 Routing Information Protocol

↳ Aim: Configuring RIP routing protocol in routers.

↳ Topology:



↳ Procedure:

i) Place 3 generic routers and 2 generic PCs in the workspace

ii) Connect the routers and the two PCs using copper cross over

iii) Connect the routers using serial DCE with clock symbol.

iv) Place notes near the PCs and routers.

v) Select the IP address of PC0 and PC1 as well as their subnet mask and default gateway.

vi) Go to the CLI of router 0 and enter the following

commands:

→ enable
→ config t
→ interface fastEthernet 0/0
→ ip addres 10.0.0.10 255.0.0.0
→ no shut

The connection should turn green. Repeat for PC1 and router 2 as well.

Now, Open CLI of router 0 and enter the following commands:

→ enable
→ config t
→ interface serial 2/0
→ ip addres 20.0.0.10 255.0.0.0
→ encapsulation PPP
→ clock rate 64000
→ no shut.

Open CLI of router 1:
→ enable
→ config t
→ interface serial 2/0
→ ip addres 20.0.0.20 255.0.0.0
→ encapsulation PPP
→ no shut.

The connection will turn green.

Open CLI of router 1 again:
→ enable
→ config t
→ interface serial 3/0
→ ip addres 30.0.0.10 255.0.0.0.

→ encapsulation PPP
→ clock rate 64000
→ no shut.

Open CLI of router 2:
→ enable
→ config t
→ interface serial 2/0
→ ip addres 30.0.0.20 255.0.0.0
→ encapsulation PPP
→ no shut.

Now,
Open CLI of router 0 and enter the following commands:

(Config) # router ip
config - router # network 10.0.0.0
Config - router # network 20.0.0.0
Config - router # ent
→ show ip route.

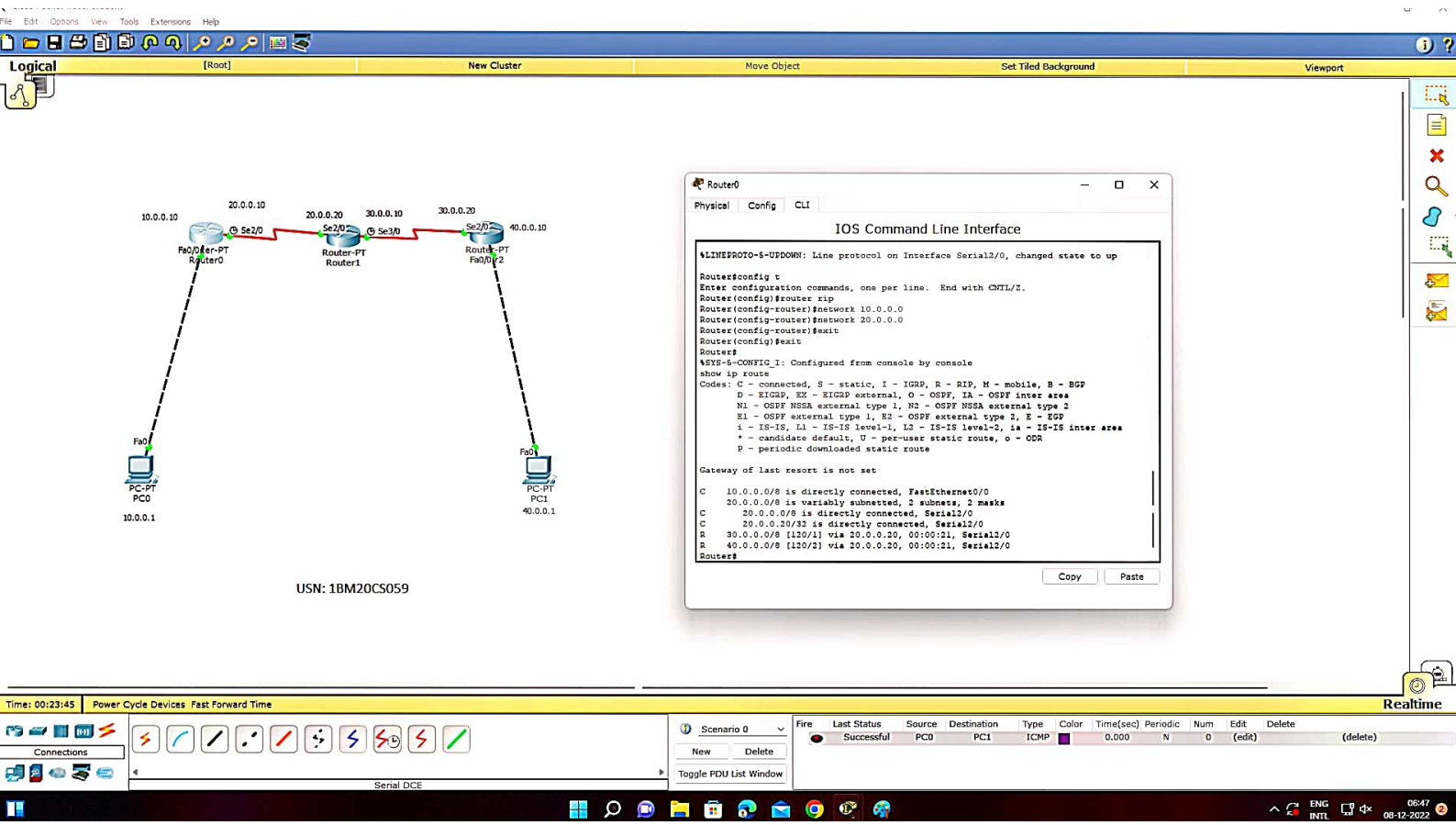
Similarly repeat for router 1 and router 2 with networks 20 & 30 and 30 & 40.

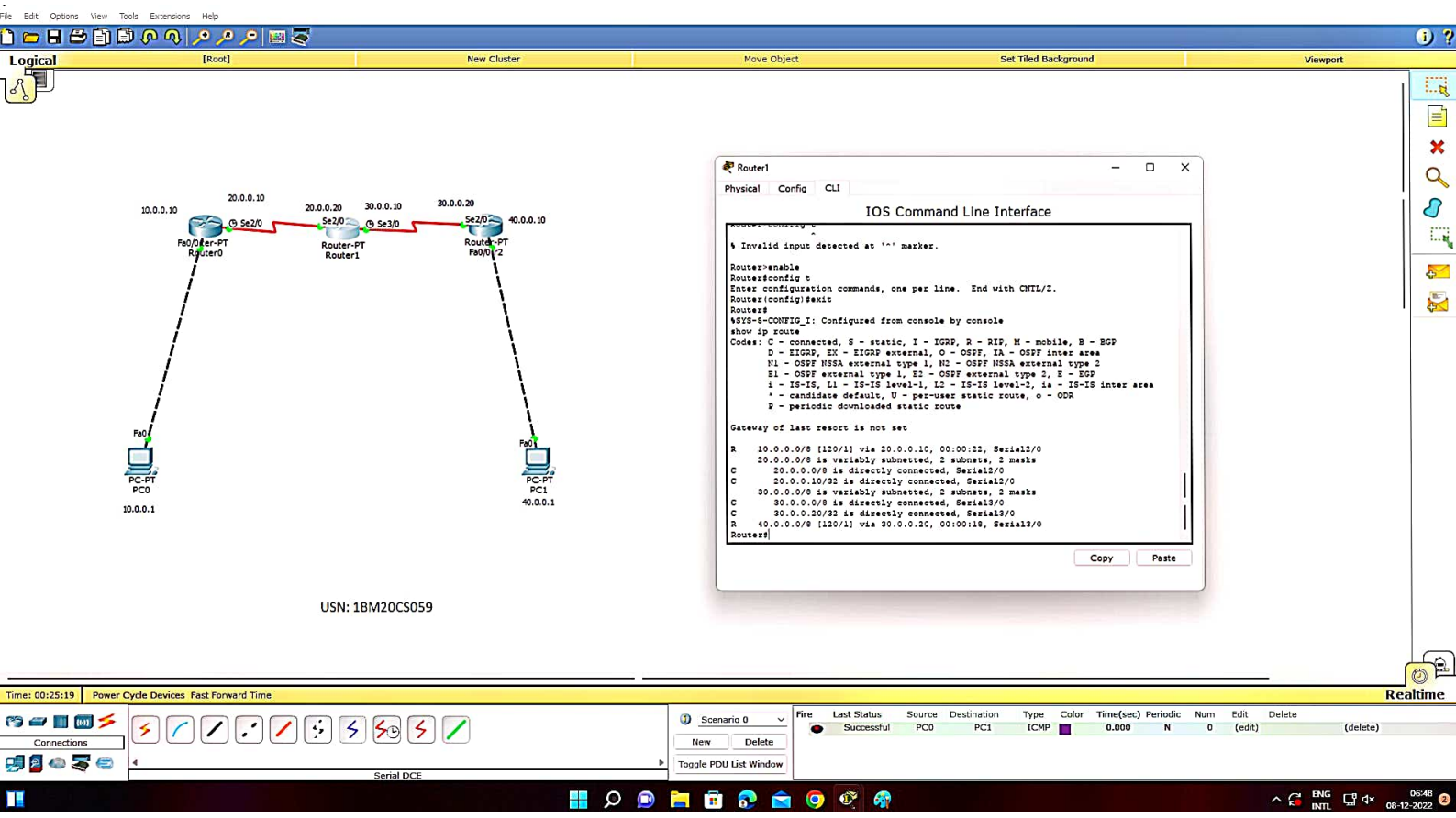
Simulation mode: Add a simple PDU by selecting the PCs and click on auto capture from right panel.

Real time mode: Select PC0 go to command prompt and select the destination addres 40.0.0.1.

Observation:

Learning outcome: Routing information protocol is a protocol that routers use to exchange information of topology among the network.

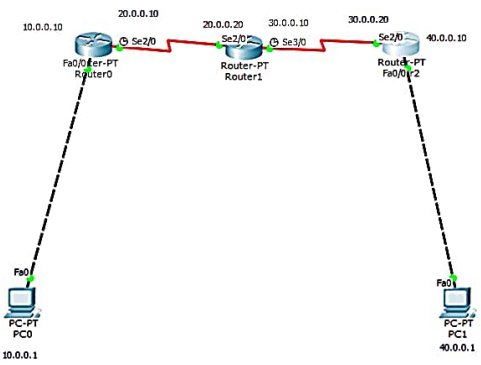

Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se2/0
Se3/0
Se2/0
Router-PT
Router0
Router-PT
Router1
Router-PT
Router2
Fa0
Fa0
PC-PT
PC0
10.0.0.1
PC-PT
PC1
40.0.0.1
USN: 1BM20CS059
Router0
Physical
Config
CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial2/0
C 20.0.0.20/32 is directly connected, Serial2/0
R 30.0.0.0/8 [120/1] via 20.0.0.20, 00:00:21, Serial2/0
R 40.0.0.0/8 [120/2] via 20.0.0.20, 00:00:21, Serial2/0
Router#
Copy
Paste
Time: 00:23:45
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)
ENG
INTL
06:47
08-12-2022


File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se2/0
Se3/0
Se2/0
Router-PT
Router0
Router-PT
Router1
Router-PT
Router2
Fa0
Fa0
PC-PT
PC0
10.0.0.1
PC-PT
PC1
40.0.0.1
USN: 1BM20CS059
Router1
Physical
Config
CLI
IOS Command Line Interface
% Invalid input detected at '^' marker.
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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
R 10.0.0.0/8 [120/1] via 20.0.0.10, 00:00:22, Serial2/0
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial2/0
C 20.0.0.10/32 is directly connected, Serial2/0
30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 30.0.0.0/8 is directly connected, Serial3/0
C 30.0.0.20/32 is directly connected, Serial3/0
R 40.0.0.0/8 [120/1] via 30.0.0.20, 00:00:18, Serial3/0
Router#
Copy
Paste
Time: 00:25:19
Power Cycle Devices Fast Forward Time
Realtime
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
PC0
PC1
ICMP
0.000
N
0
(edit)
(delete)
ENG
INTL
06:48
08-12-2022

Cisco Packet Tracer Student

File Edit Options View Tools Extensions Help

Logical | [Root] | New Cluster | Move Object | Set Tiled Background | Viewport



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Router2

Physical | Config | CLI

IOS Command Line Interface

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
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

R    10.0.0.0/8 [120/2] via 30.0.0.10, 00:00:17, Serial2/0
R    20.0.0.0/8 [120/1] via 30.0.0.10, 00:00:17, Serial2/0
     30.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       30.0.0.0/8 is directly connected, Serial2/0
C       30.0.0.10/32 is directly connected, Serial2/0
C    40.0.0.0/8 is directly connected, FastEthernet0/0
Router#
```

Copy | Paste

Time: 00:28:16 | Power Cycle Devices | Fast Forward Time | Realtime

Connections | Serial DCE

Scenario 0 | New | Delete | Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	PC1	ICMP		0.000	N	0	(edit)	(delete)

ENG INTL 06:51 08-12-2022

It is used when in place of static II routing because with the help of rip protocol routing it becomes easy when large scale of routers is present.

4) Result:

1. PC> ping 40.0.0.1

Request timed out
Reply from 40.0.0.1 : bytes = 32 time=6ms 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).

2. PC> ping 40.0.0.1

Pinging 40.0.0.1 with 32 bytes of data:

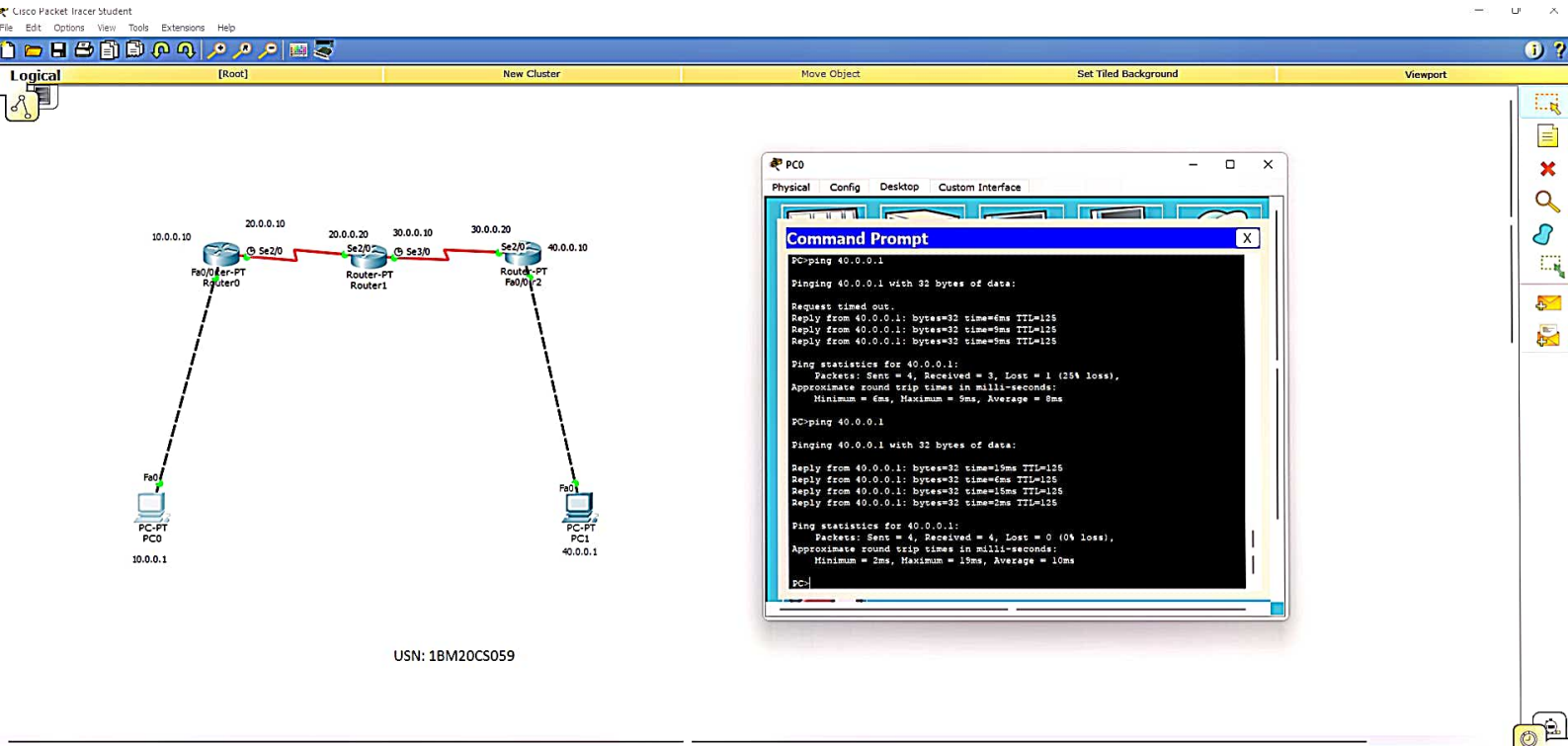
Reply from 40.0.0.1: bytes =32 time = 19ms TTL=125.
Reply from 40.0.0.1: bytes = 32 time =6ms TTL=125.
Reply from 40.0.0.1: bytes =32 time =15ms TTL=125.
Reply from 40.0.0.1: bytes =32 time = 2ms TTL=125.

Ping statistics for 40.0.0.1:

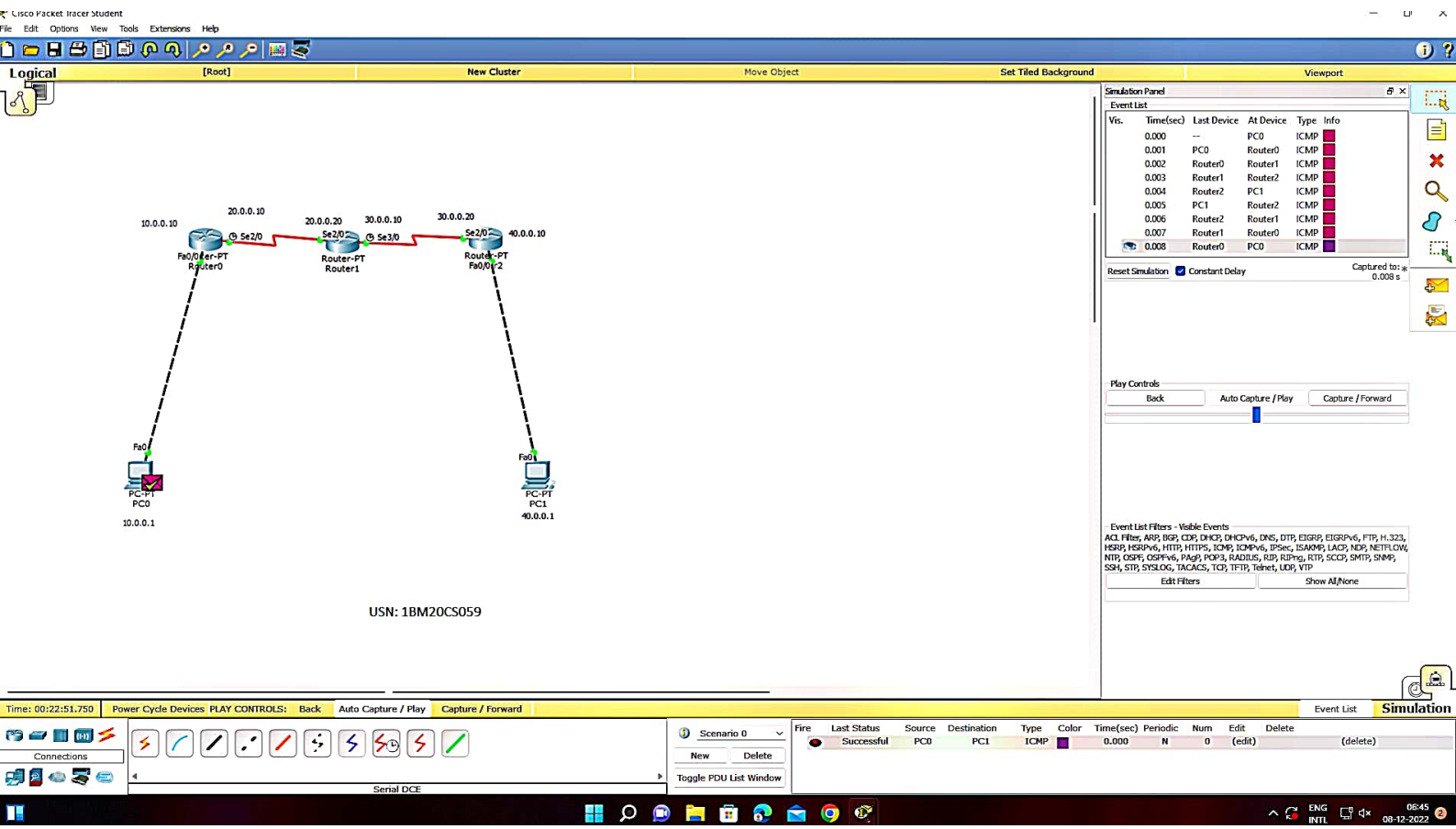
Packets: Sent =4, Received =4, Lost =0 (0% loss).

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 19ms, Average =10 ms.



USN: 1BM20CS059


Cisco Packet Tracer Student
File Edit Options View Tools Extensions Help
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
10.0.0.10
20.0.0.10
20.0.0.20
30.0.0.10
30.0.0.20
40.0.0.10
Se2/0
Se3/0
Router-PT
Router0
Router1
Router2
Fa0
PC-PT
PC0
PC1
10.0.0.1
40.0.0.1
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type Info
0.000 -- PC0 ICMP
0.001 PC0 Router0 ICMP
0.002 Router0 Router1 ICMP
0.003 Router1 Router2 ICMP
0.004 Router2 PC1 ICMP
0.005 PC1 Router2 ICMP
0.006 Router2 Router1 ICMP
0.007 Router1 Router0 ICMP
0.008 Router0 PC0 ICMP
Reset Simulation
Constant Delay
Captured to: 0.008 s
Play Controls
Back
Auto Capture / Play
Capture / Forward
Event List Filters - Visible Events
ACL Filter, ARP, BGP, CDP, DHCP, DHCPv6, DNS, DTP, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, LACP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, RADIUS, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, VTP
Edit Filters
Show All/None
USN: 1BM20CS059
Time: 00:22:51.750
Power Cycle Devices PLAY CONTROLS: Back Auto Capture / Play Capture / Forward
Event List
Simulation
Connections
Serial DCE
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 PC1 ICMP 0.000 N 0 (edit) (delete)
ENG INTL
06:45
08-12-2022