CN LAB Detailed Procedures

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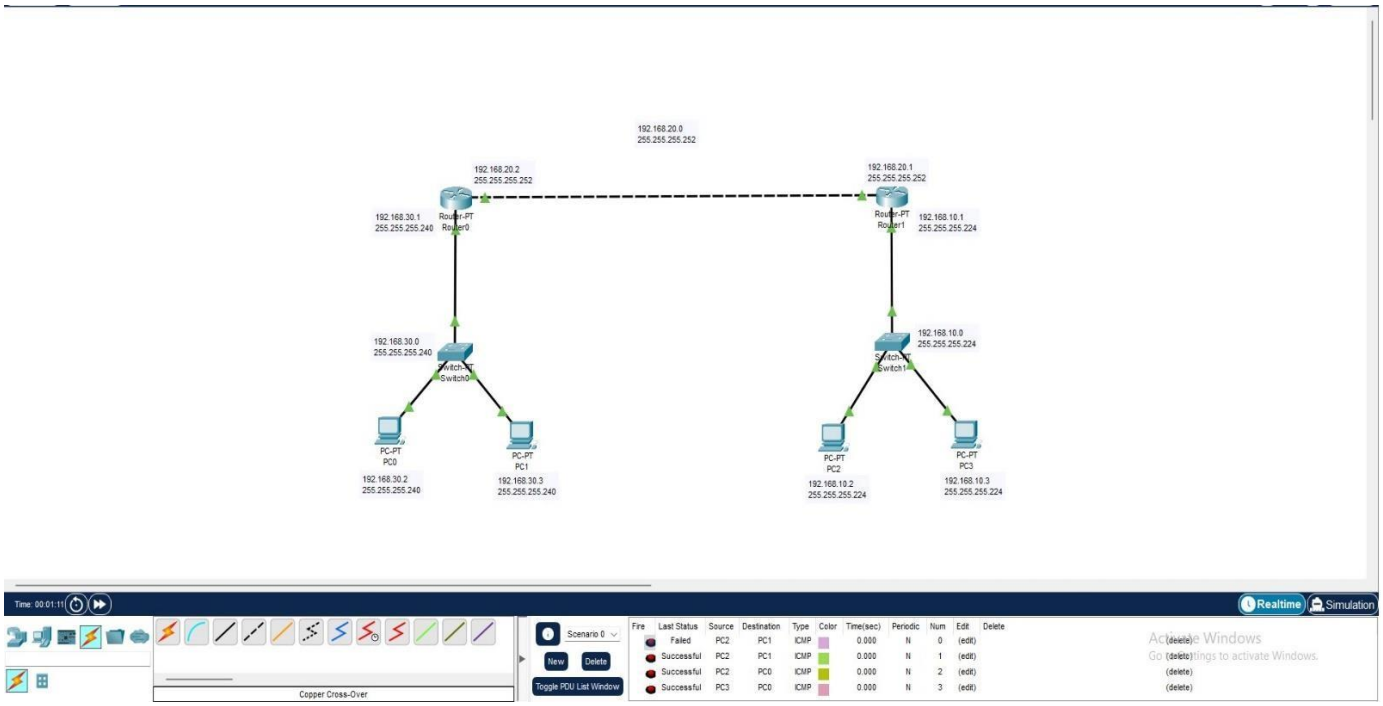
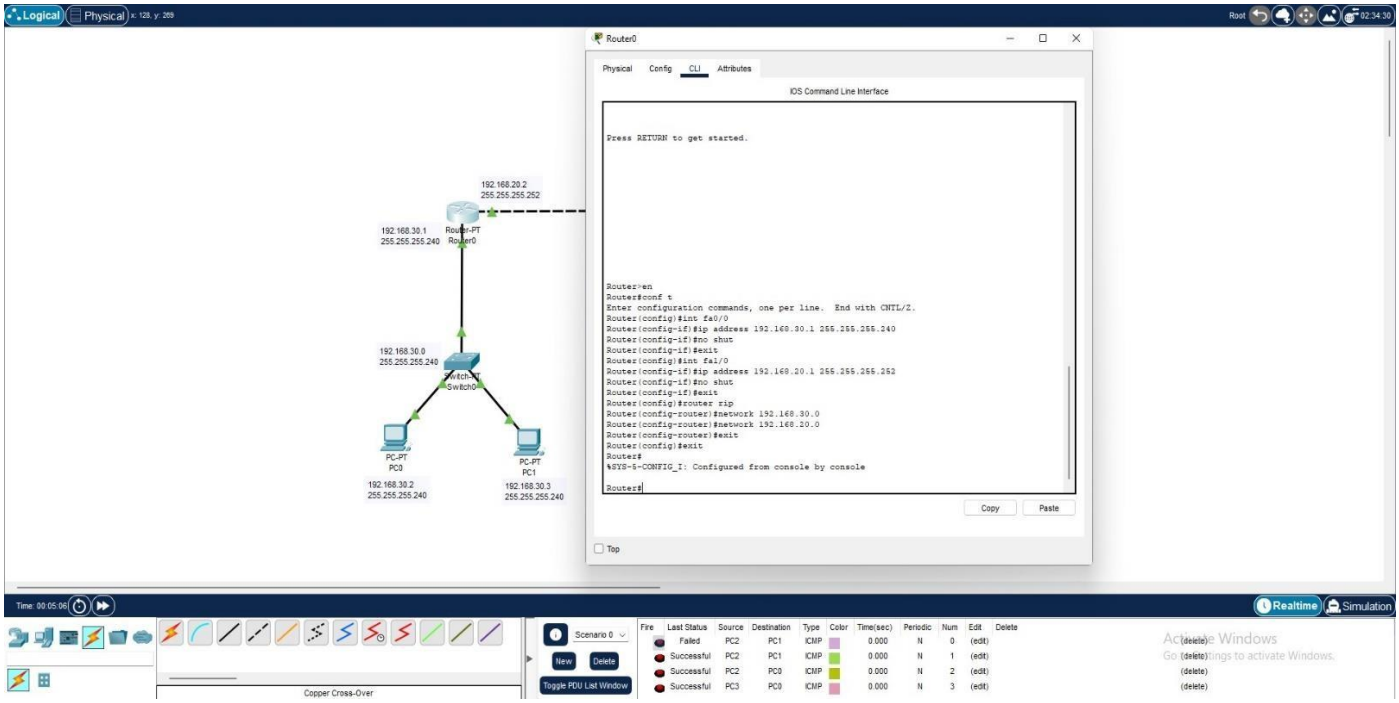
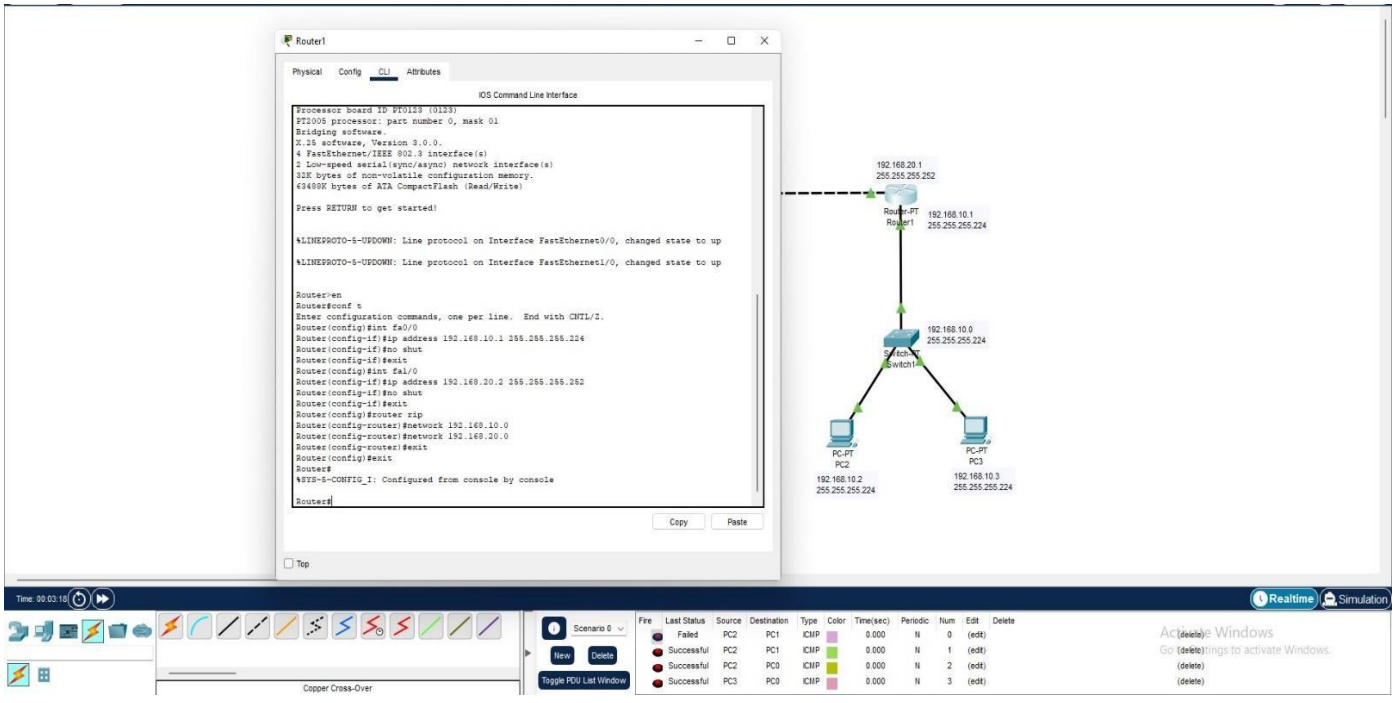
Lab 7: Implementation of RIP Version 1

- **Procedure:**
  1. Open Packet Tracer:
  ■ Launch Cisco Packet Tracer on your computer.
  2. Create a Network:
  ■ Drag three routers onto the workspace and connect them in a linear topology.
  ■ Connect a computer to each router using Ethernet cables.
  3. Configure IP Addresses:
  ■ Assign IP addresses to each interface on the routers and computers.
  4. Enable RIP Version 1:
  ■ Access the CLI of each router.
  ■ Enable RIP routing: router rip, version 1.
  ■ Advertise connected networks: network <network address>.
  5. Test Connectivity:
  ■ Use the ping command to test connectivity between the computers

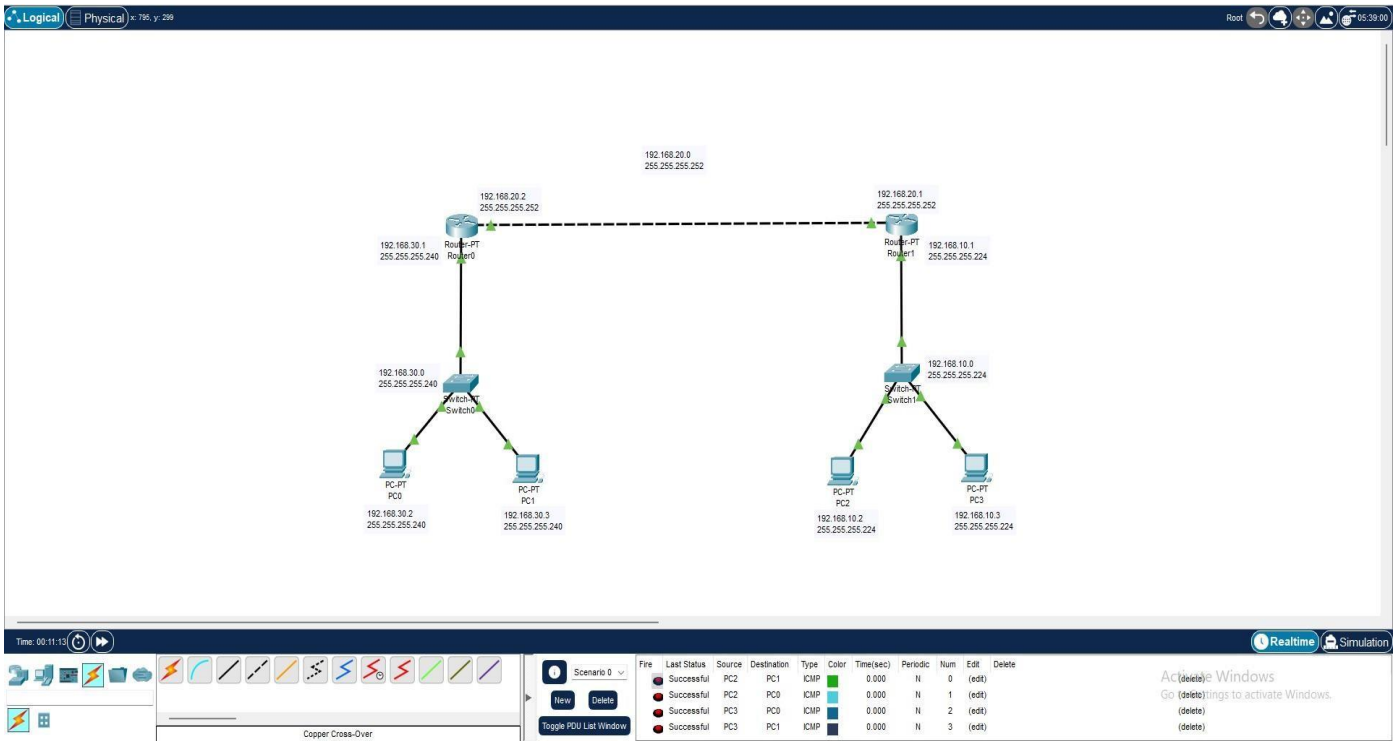


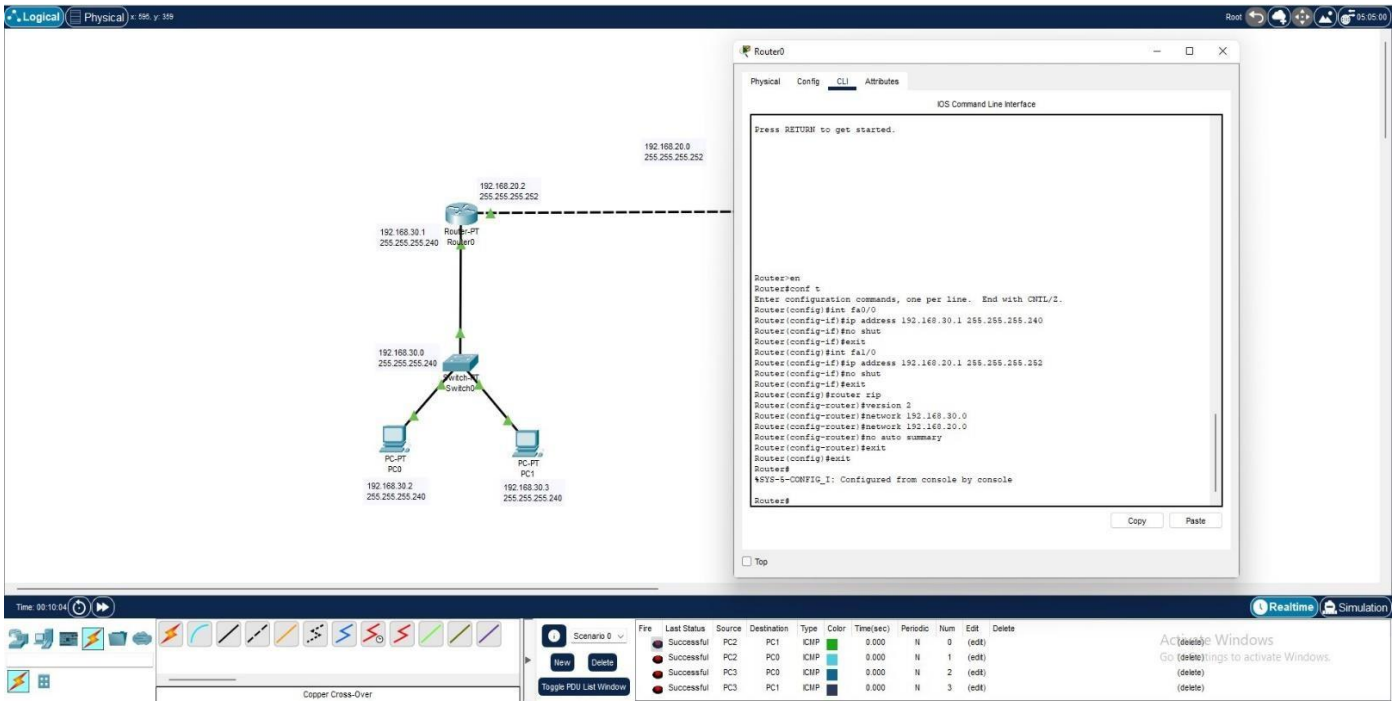

Logical
Physical
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/2.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.30.1 255.255.255.240
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#int fa1/0
Router(config-if)#ip address 192.168.20.1 255.255.255.252
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 192.168.30.0
Router(config-router)#network 192.168.20.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
Copy
Paste
Top
192.168.20.2
255.255.255.252
192.168.30.1
255.255.255.240
Router-PT
Router0
192.168.30.0
255.255.255.240
Switch-PT
Switch0
PC-PT
PC0
PC-PT
PC1
192.168.30.2
255.255.255.240
192.168.30.3
255.255.255.240
Time: 00:05:06
Realtime
Simulation
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Failed PC2 PC1 ICMP 0.000 N 0 (edit) (delete)
Successful PC2 PC1 ICMP 0.000 N 1 (edit) (delete)
Successful PC2 PC0 ICMP 0.000 N 2 (edit) (delete)
Successful PC3 PC0 ICMP 0.000 N 3 (edit) (delete)

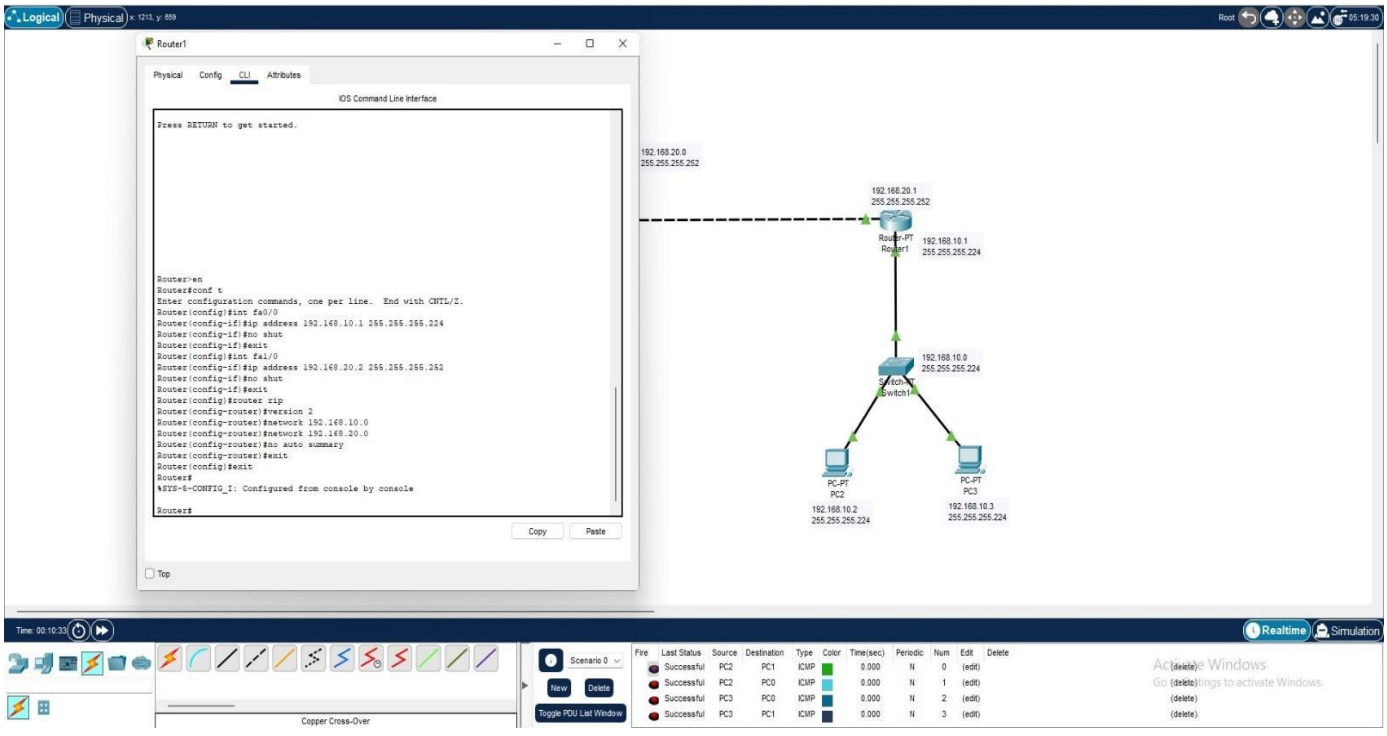

Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
Press RETURN to get started!
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.10.1 255.255.255.224
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#int fa1/0
Router(config-if)#ip address 192.168.20.2 255.255.255.252
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 192.168.10.0
Router(config-router)#network 192.168.20.0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
Copy
Paste
Top
192.168.20.1
255.255.255.252
Router-PT
Router1
192.168.10.1
255.255.255.224
192.168.10.0
255.255.255.224
Switch-PT
Switch1
PC-PT
PC2
PC-PT
PC3
192.168.10.2
255.255.255.224
192.168.10.3
255.255.255.224
Time: 00:03:18
Realtime
Simulation
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Failed PC2 PC1 ICMP 0.000 N 0 (edit) (delete)
Successful PC2 PC1 ICMP 0.000 N 1 (edit) (delete)
Successful PC2 PC0 ICMP 0.000 N 2 (edit) (delete)
Successful PC3 PC0 ICMP 0.000 N 3 (edit) (delete)

Lab 8: Implementation of RIP Version 2

- **Procedure:**
    1. Open Packet Tracer:
    - Launch Cisco Packet Tracer on your computer.
    2. Create a Network:
    - Drag three routers onto the workspace and connect them in a linear topology.
    - Connect a computer to each router using Ethernet cables.
    3. Configure IP Addresses:
    - Assign IP addresses to each interface on the routers and computers.
    4. Enable RIP Version 2:
    - Access the CLI of each router.
    - Enable RIP routing: router rip, version 2.
    - Advertise connected networks: network <network address>.
    5. Test Connectivity:
    - Use the ping command to test connectivity between the computers

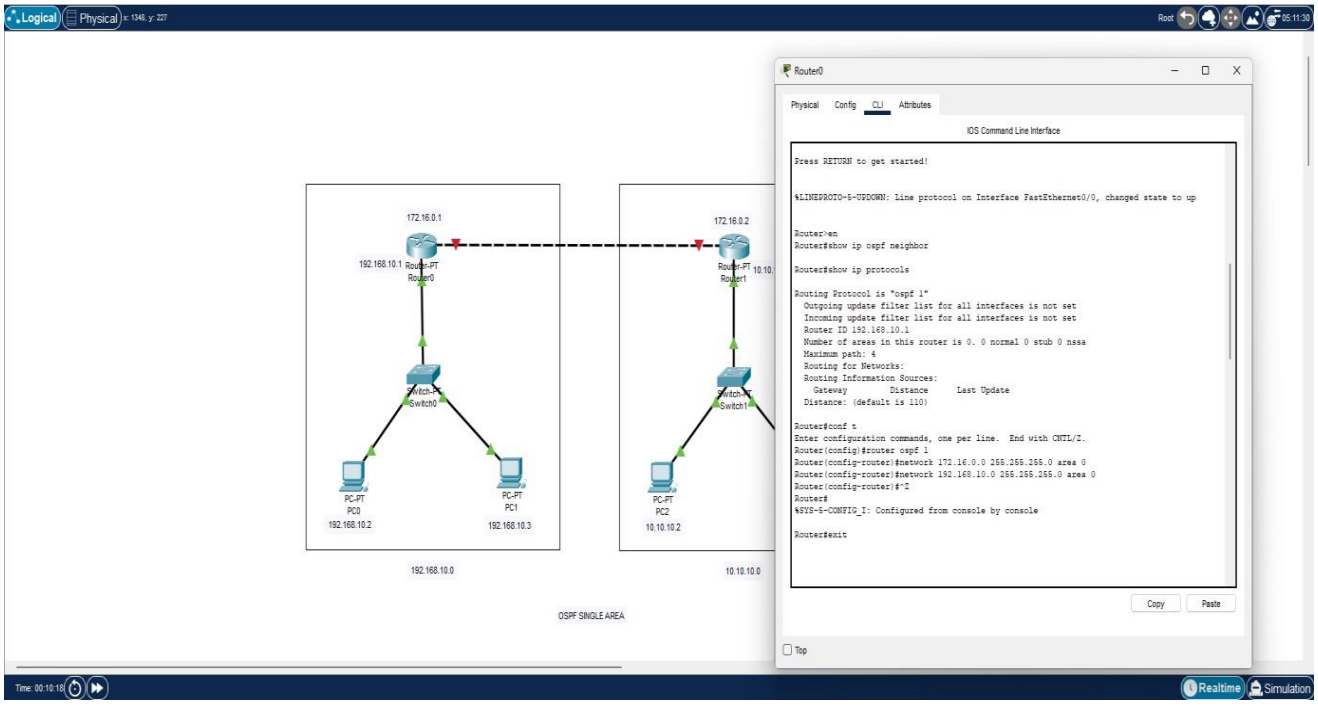


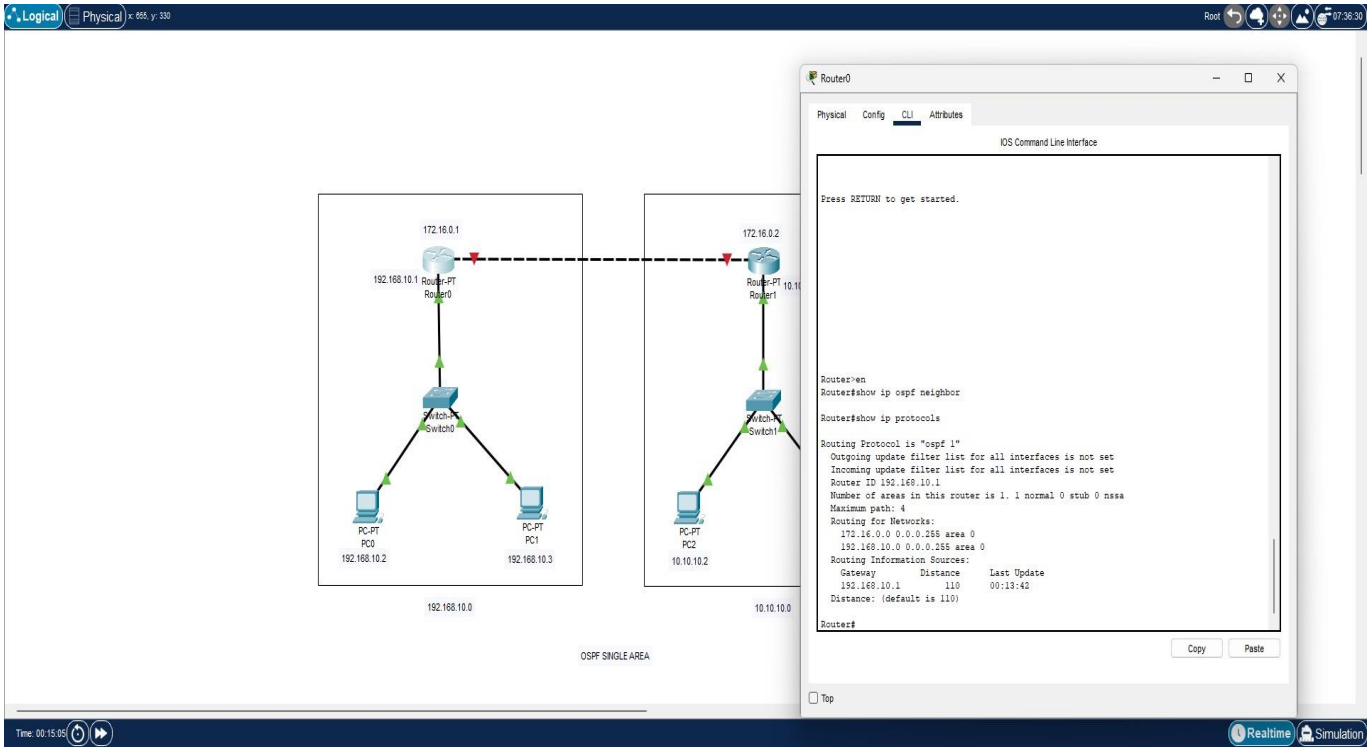

Logical
Physical
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.30.1 255.255.255.240
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#int fa1/0
Router(config-if)#ip address 192.168.20.1 255.255.255.252
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 192.168.30.0
Router(config-router)#network 192.168.20.0
Router(config-router)#no auto summary
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.2
255.255.255.252
192.168.30.1
255.255.255.240
Router-PT
Router0
192.168.30.0
255.255.255.240
Switch-PT
Switch0
PC-PT
PC0
PC-PT
PC1
192.168.30.2
255.255.255.240
192.168.30.3
255.255.255.240
Realtime
Simulation
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful PC2 PC1 ICMP 0.000 N 0 (edit) (delete)
Successful PC2 PC0 ICMP 0.000 N 1 (edit) (delete)
Successful PC3 PC0 ICMP 0.000 N 2 (edit) (delete)
Successful PC3 PC1 ICMP 0.000 N 3 (edit) (delete)

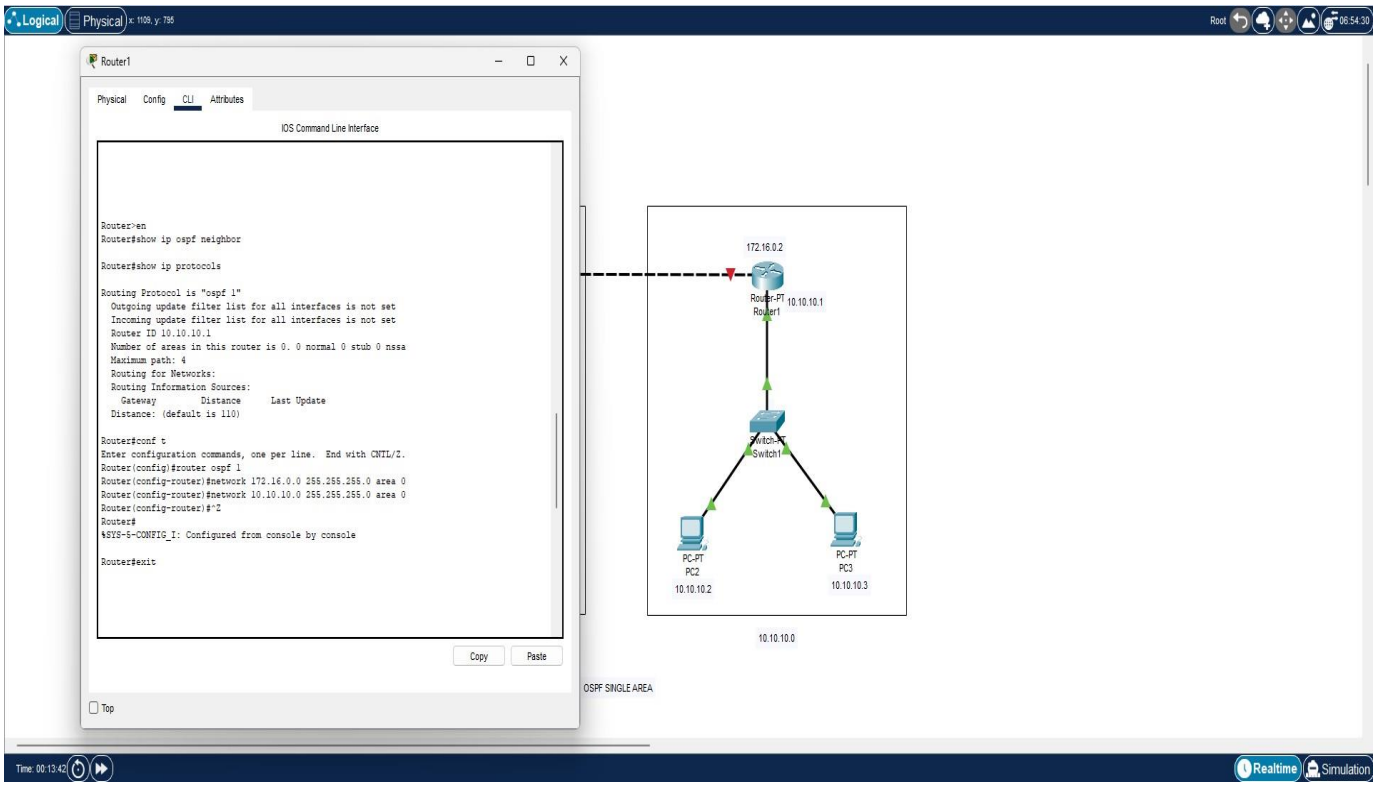

Logical
Physical
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 192.168.10.1 255.255.255.224
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#int fa1/0
Router(config-if)#ip address 192.168.20.2 255.255.255.252
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 192.168.10.0
Router(config-router)#network 192.168.20.0
Router(config-router)#no auto summary
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.1
255.255.255.252
Router-PT
Router1
192.168.10.1
255.255.255.224
192.168.10.0
255.255.255.224
Switch-PT
Switch1
PC-PT
PC2
PC-PT
PC3
192.168.10.2
255.255.255.224
192.168.10.3
255.255.255.224
Realtime
Simulation
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful PC2 PC1 ICMP 0.000 N 0 (edit) (delete)
Successful PC2 PC0 ICMP 0.000 N 1 (edit) (delete)
Successful PC3 PC0 ICMP 0.000 N 2 (edit) (delete)
Successful PC3 PC1 ICMP 0.000 N 3 (edit) (delete)

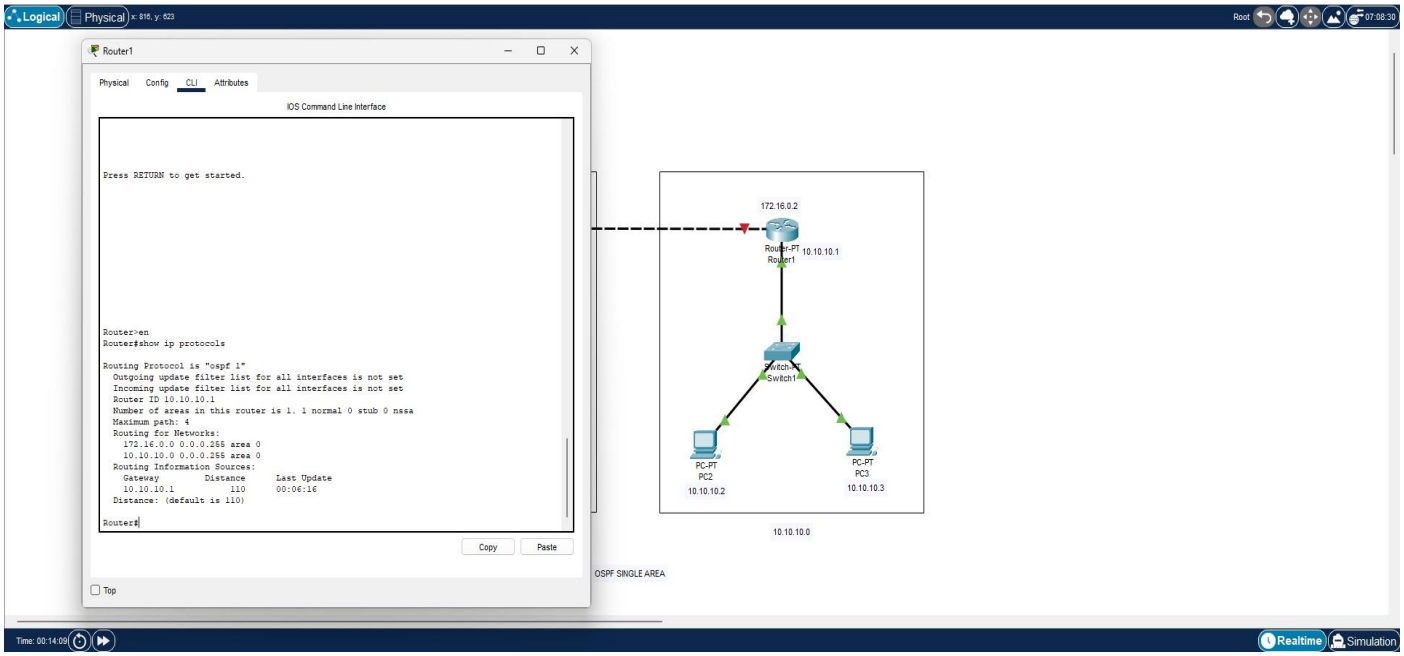
Lab 9: Implementation of Single Area OSPF

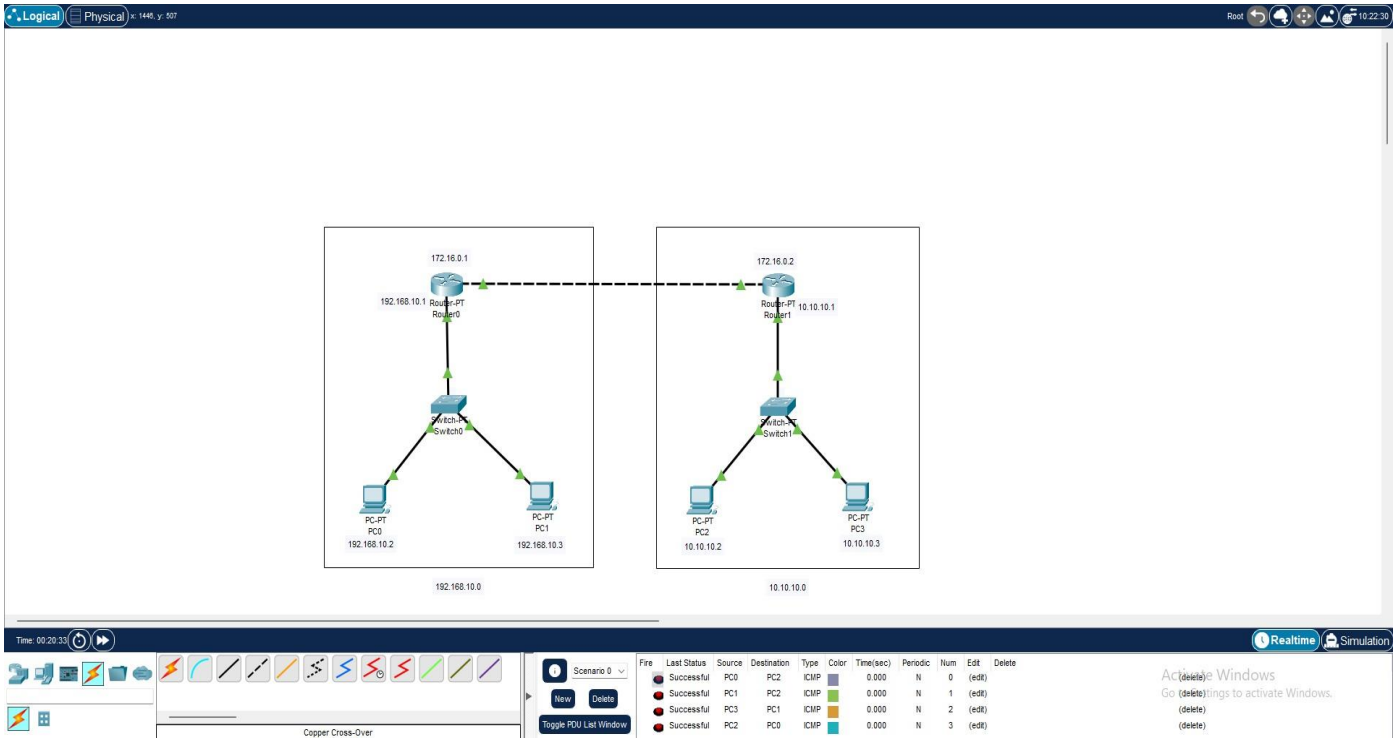
- **Procedure:**
    1. Open Packet Tracer:
    - Launch Cisco Packet Tracer on your computer.
    2. Create a Network:
    - Drag three routers onto the workspace and connect them in a triangular topology.
    - Connect a computer to each router using Ethernet cables.
    3. Configure IP Addresses:
    - Assign IP addresses to each interface on the routers and computers.
    4. Enable OSPF:
    - Access the CLI of each router.
    - Enable OSPF: router ospf 1.
    - Advertise connected networks: network <network address> area 0.
    5. Test Connectivity:
    - Use the ping command to test connectivity between the computers




Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#show ip ospf neighbor
Router#show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 192.168.10.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.16.0.0 0.0.0.255 area 0
192.168.10.0 0.0.0.255 area 0
Routing Information Sources:
Gateway Distance Last Update
192.168.10.1 110 00:13:42
Distance: (default is 110)
Router#
Copy
Paste
Top
172.16.0.1
192.168.10.1
Router-PT
Router0
172.16.0.2
Router-PT
Router1
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
192.168.10.2
PC-PT
PC1
192.168.10.3
PC-PT
PC2
10.10.10.2
192.168.10.0
10.10.10.0
OSPF SINGLE AREA
Time: 00:15:05
Realtime
Simulation

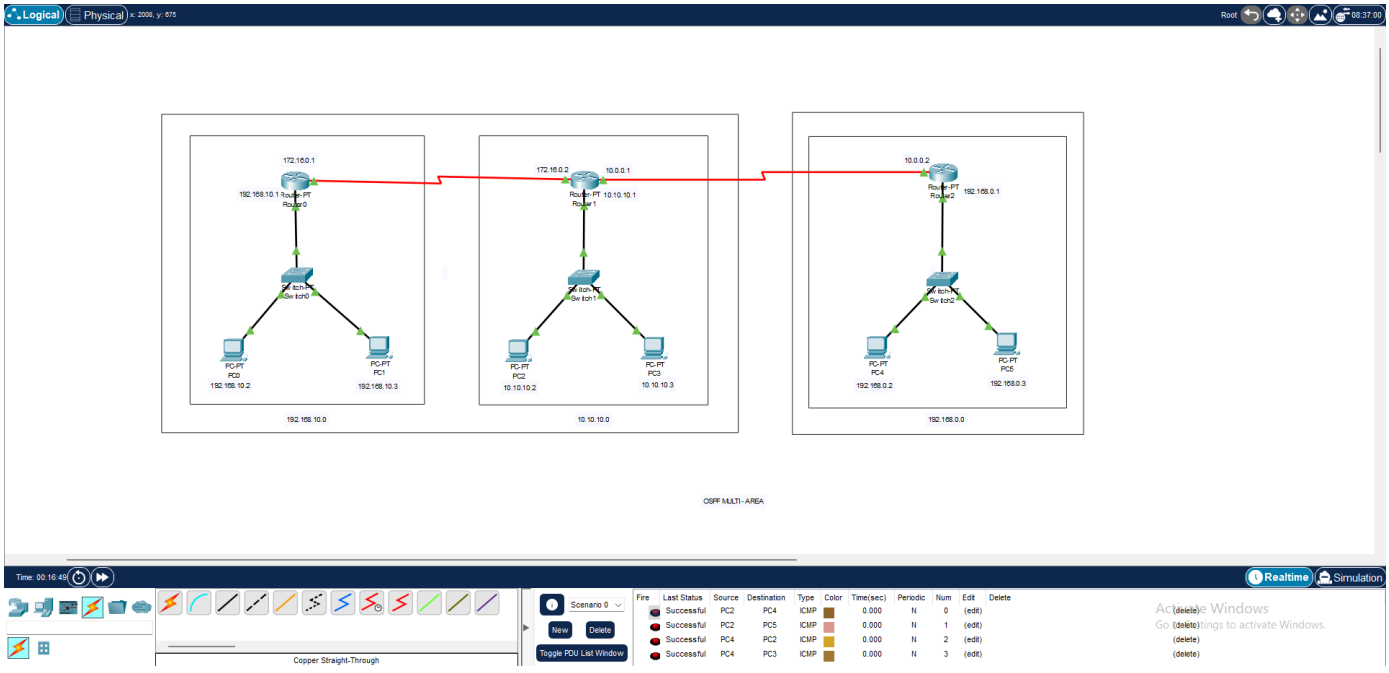

Logical
Physical
Root
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#show ip ospf neighbor
Router#show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 10.10.10.1
Number of areas in this router is 0. 0 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
Routing Information Sources:
Gateway Distance Last Update
Distance: (default is 110)
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 172.16.0.0 255.255.255.0 area 0
Router(config-router)#network 10.10.10.0 255.255.255.0 area 0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#exit
Copy
Paste
Top
172.16.0.2
Router-PT
Router1
10.10.10.1
Switch-PT
Switch1
PC-PT
PC2
10.10.10.2
PC-PT
PC3
10.10.10.3
10.10.10.0
OSPF SINGLE AREA
Time: 00:13:42
Realtime
Simulation

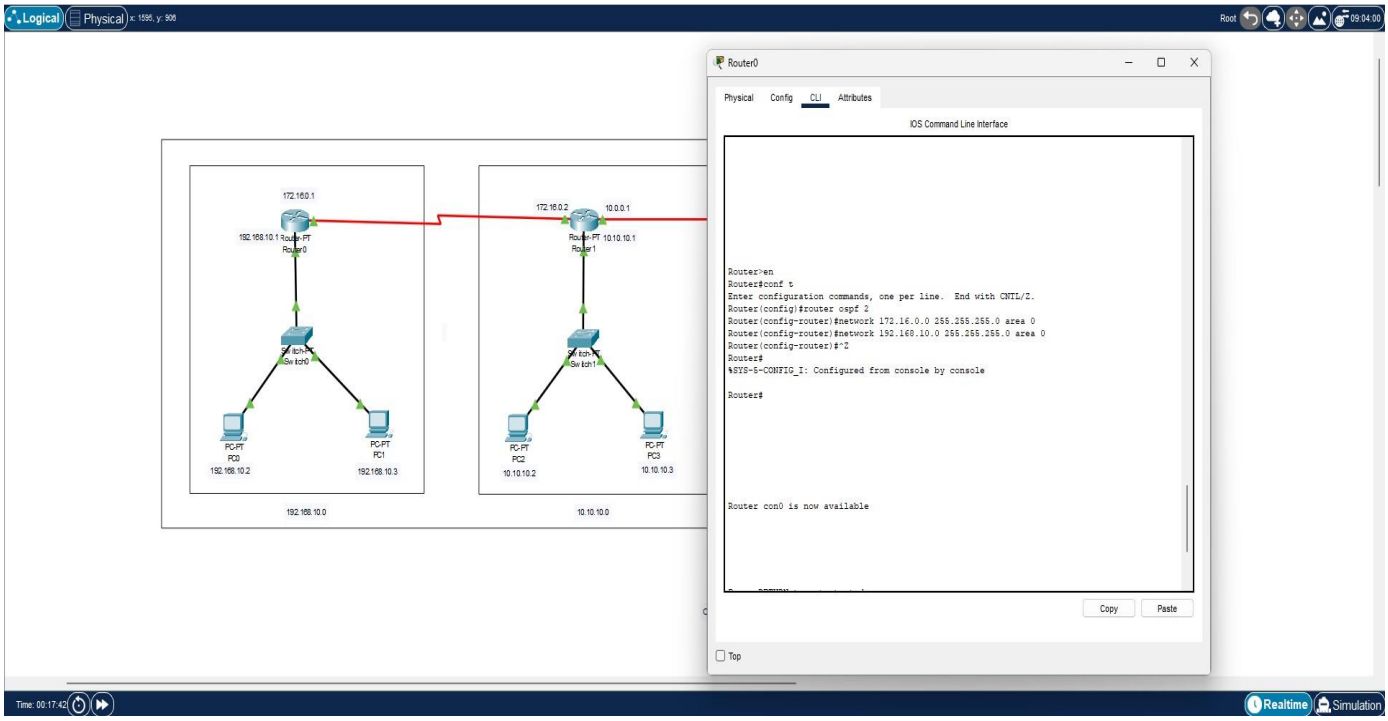

Logical
Physical
Root
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 10.10.10.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.16.0.0 0.0.0.255 area 0
10.10.10.0 0.0.0.255 area 0
Routing Information Sources:
Gateway Distance Last Update
10.10.10.1 110 00:06:16
Distance: (default is 110)
Router#
Copy
Paste
Top
172.16.0.2
Router-PT
Router1
10.10.10.1
Switch-PT
Switch1
PC-PT
PC2
10.10.10.2
PC-PT
PC3
10.10.10.3
10.10.10.0
OSPF SINGLE AREA
Time: 00:14:09
Realtime
Simulation

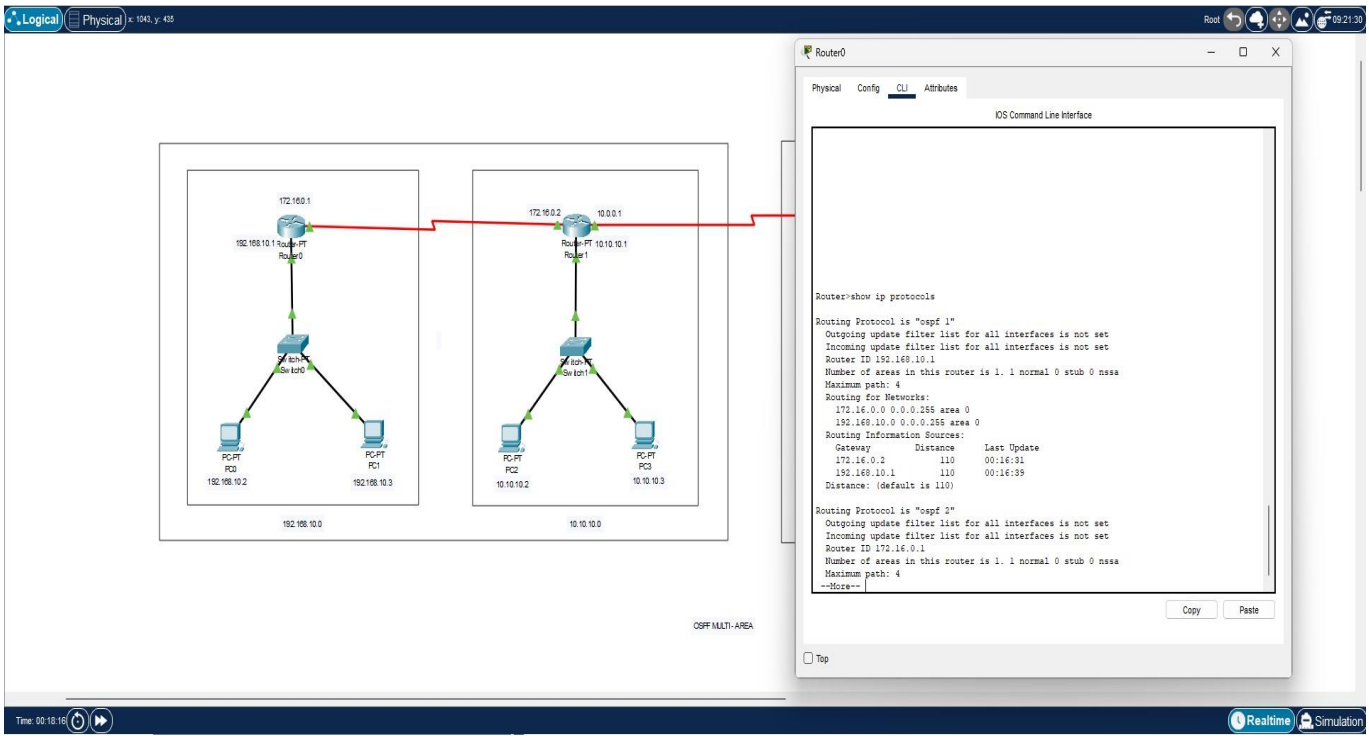

Logical
Physical
Root
172.16.0.1
192.168.10.1
Router-PT
Router0
Switch-PT
Switch0
PC-PT
PC0
192.168.10.2
PC-PT
PC1
192.168.10.3
192.168.10.0
172.16.0.2
Router-PT
Router1
10.10.10.1
Switch-PT
Switch1
PC-PT
PC2
10.10.10.2
PC-PT
PC3
10.10.10.3
10.10.10.0
Time: 00:20:33
Realtime
Simulation
Copper Cross-Over
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful PC0 PC2 ICMP 0.000 N 0 (edit) (delete)
Successful PC1 PC2 ICMP 0.000 N 1 (edit) (delete)
Successful PC3 PC1 ICMP 0.000 N 2 (edit) (delete)
Successful PC2 PC0 ICMP 0.000 N 3 (edit) (delete)

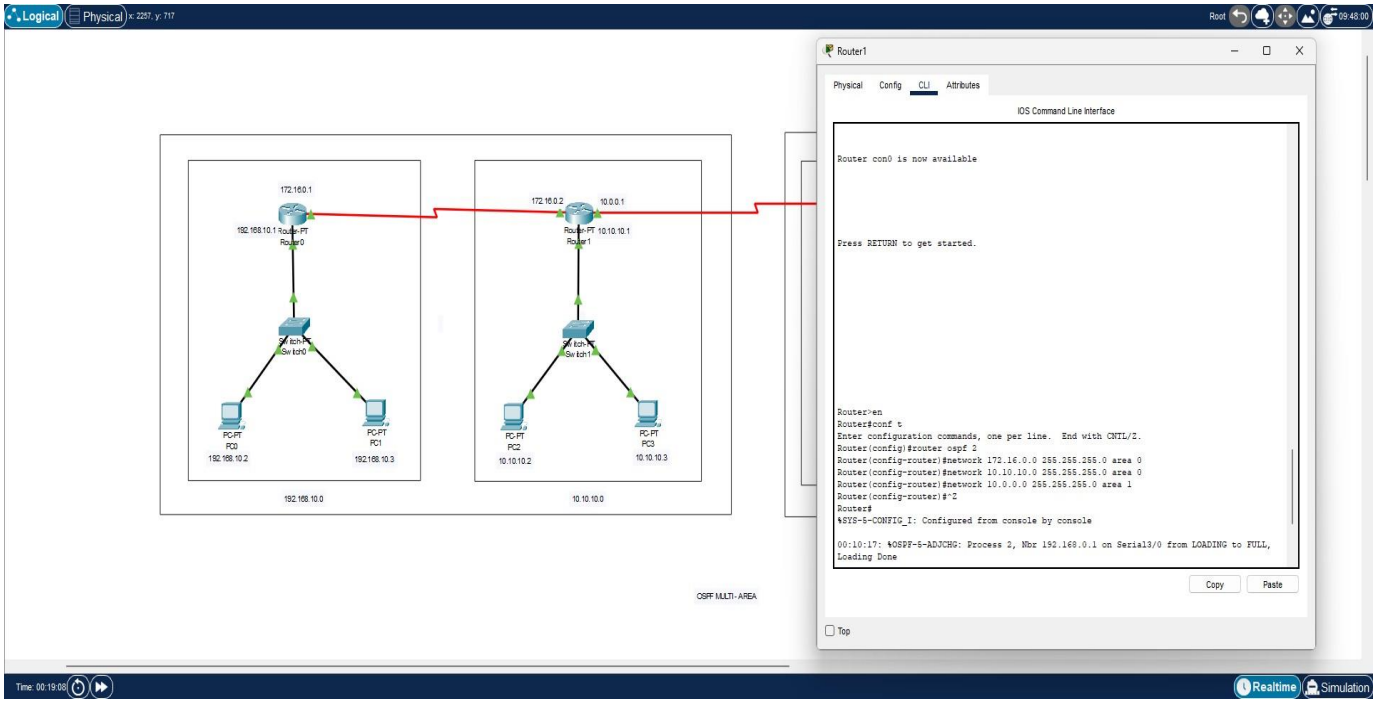
Lab 10: Implementation of Multi Area OSPF

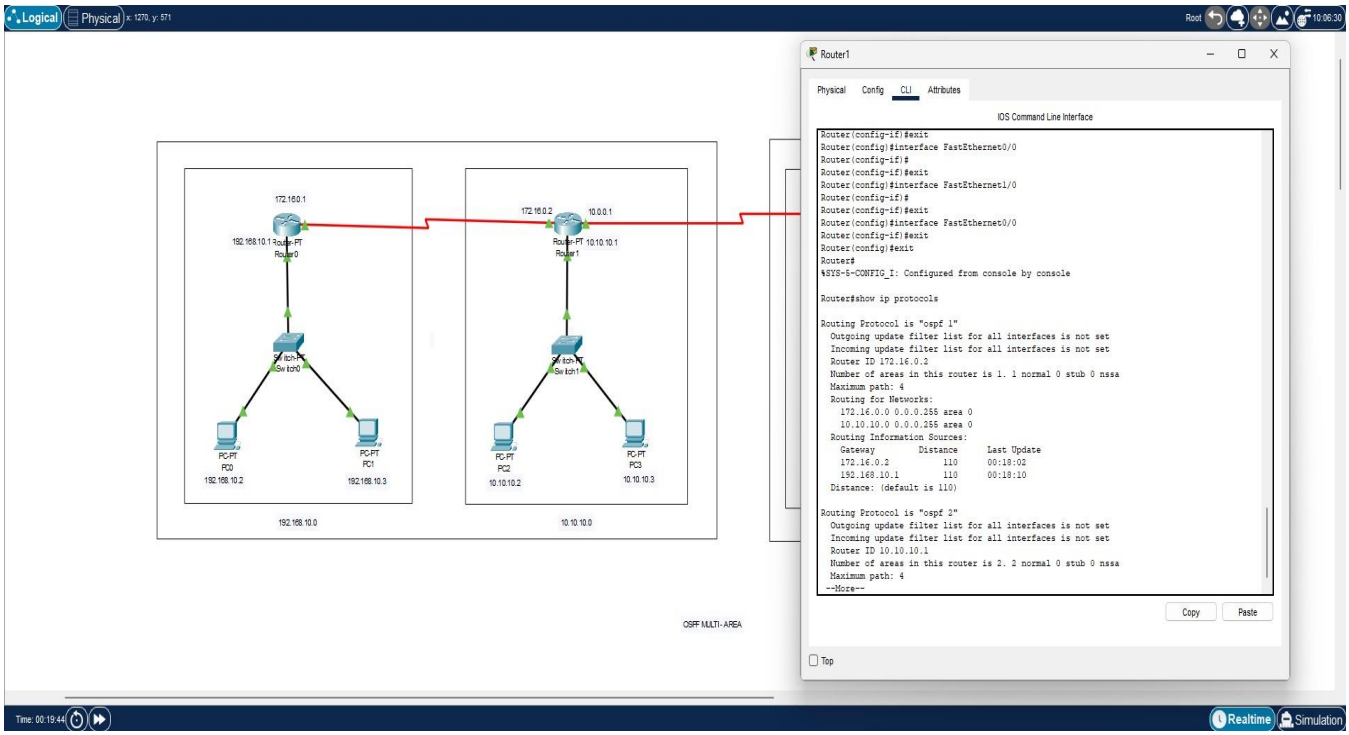
- **Procedure:**
  1. Open Packet Tracer:
  - Launch Cisco Packet Tracer on your computer.
  2. Create a Network:
  - Drag four routers onto the workspace and connect them to form two separate OSPF areas with an Area 0 backbone.
  - Connect a computer to each router using Ethernet cables.
  3. Configure IP Addresses:
  - Assign IP addresses to each interface on the routers and computers.
  4. Enable OSPF:
  - Access the CLI of each router.
  - Enable OSPF on Area 0 routers: router ospf 1.
  - Advertise connected networks: network <network address> area 0.
  - Enable OSPF on Area 1 routers: router ospf 1.
  - Advertise connected networks: network <network address> area
  5. Test Connectivity:
  - Use the ping command to test connectivity between the computers.

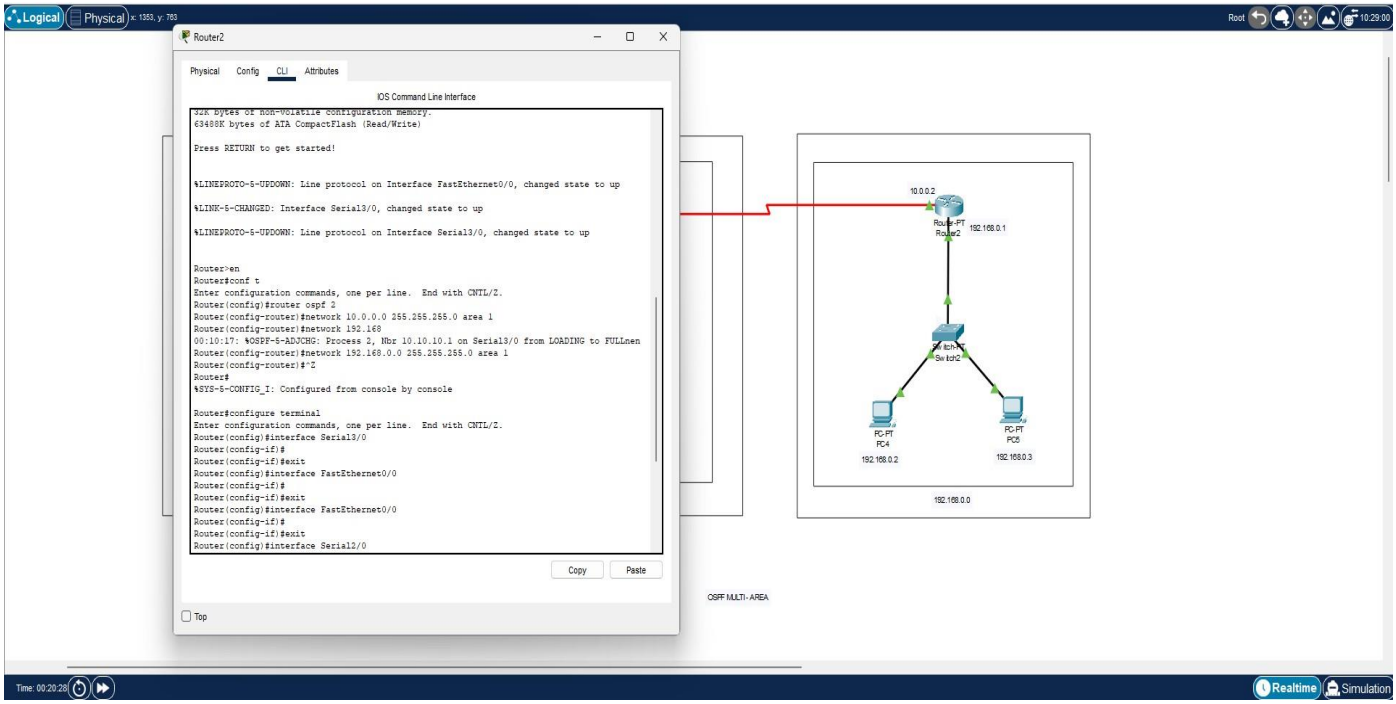


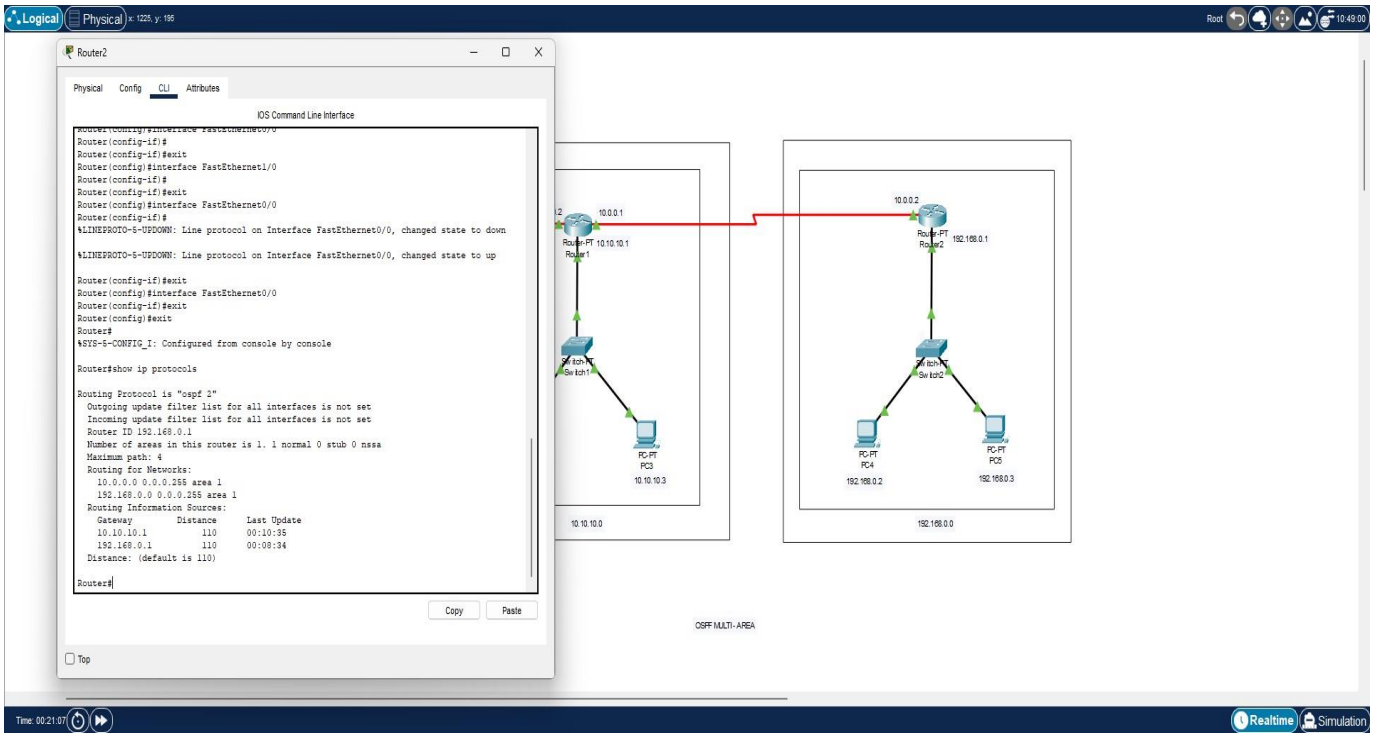

Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 2
Router(config-router)#network 172.16.0.0 255.255.255.0 area 0
Router(config-router)#network 192.168.10.0 255.255.255.0 area 0
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
Router con0 is now available
Copy
Paste
Top
172.16.0.1
192.168.10.1
Router-PT
Router0
172.16.0.2
10.0.0.1
Router-PT
10.10.10.1
Router1
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
192.168.10.2
PC-PT
PC1
192.168.10.3
PC-PT
PC2
10.10.10.2
PC-PT
PC3
10.10.10.3
192.168.10.0
10.10.10.0
Time: 00:17:42
Realtime
Simulation


Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 192.168.10.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.16.0.0 0.0.0.255 area 0
192.168.10.0 0.0.0.255 area 0
Routing Information Sources:
Gateway Distance Last Update
172.16.0.2 110 00:16:31
192.168.10.1 110 00:16:39
Distance: (default is 110)
Routing Protocol is "ospf 2"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 172.16.0.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
--More--
Copy
Paste
Top
OSPF MULTI-AREA
Time: 00:18:16
Realtime
Simulation


Logical
Physical
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router con0 is now available
Press RETURN to get started.
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 2
Router(config-router)#network 172.16.0.0 255.255.255.0 area 0
Router(config-router)#network 10.10.10.0 255.255.255.0 area 0
Router(config-router)#network 10.0.0.0 255.255.255.0 area 1
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
00:10:17: %OSPF-5-ADJCHG: Process 2, Nbr 192.168.0.1 on Serial3/0 from LOADING to FULL,
Loading Done
Copy
Paste
Top
172.16.0.1
192.168.10.1
Router-PT
Router0
172.16.0.2
10.0.0.1
Router-PT
10.10.10.1
Router1
PC-PT
PC0
192.168.10.2
PC-PT
PC1
192.168.10.3
PC-PT
PC2
10.10.10.2
PC-PT
PC3
10.10.10.3
192.168.10.0
10.10.10.0
OSFF MULTI-AREA
Realtime
Simulation

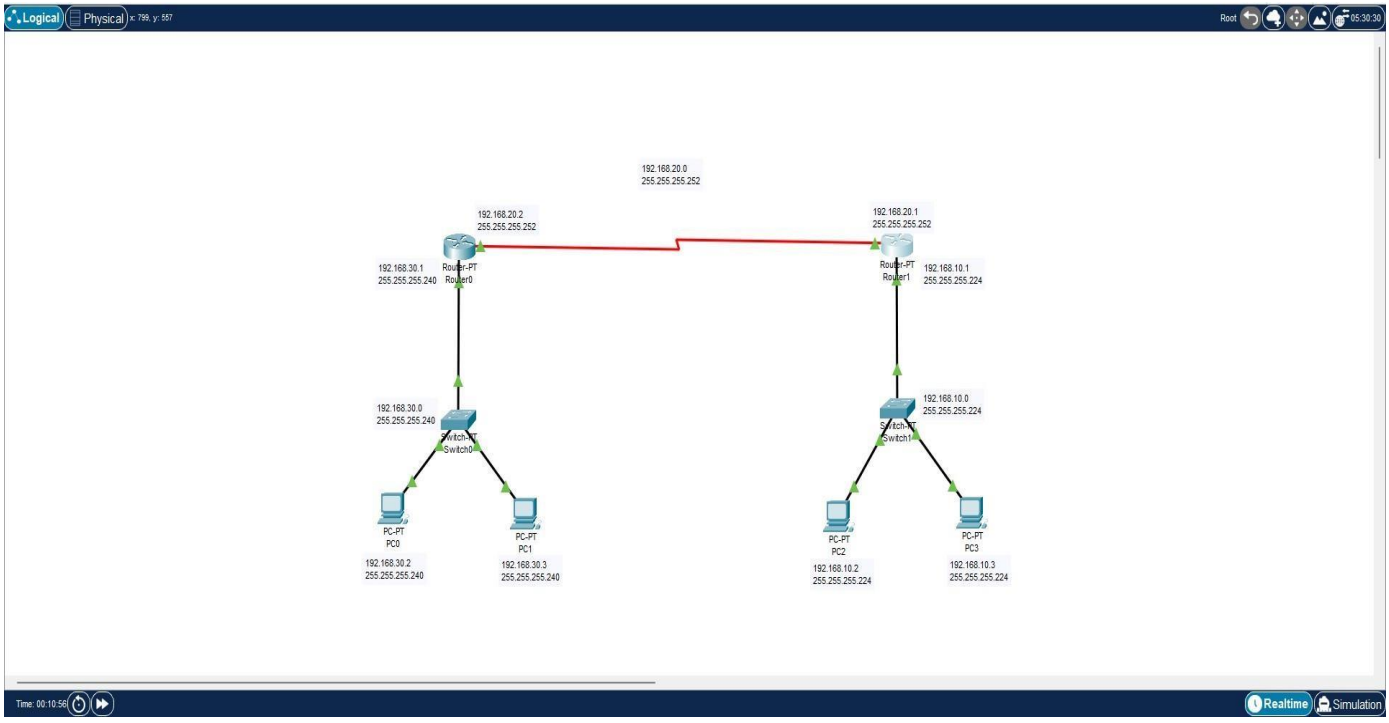

Logical
Physical
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip protocols
Routing Protocol is "ospf 1"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 172.16.0.2
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
172.16.0.0 0.0.0.255 area 0
10.10.10.0 0.0.0.255 area 0
Routing Information Sources:
Gateway Distance Last Update
172.16.0.2 110 00:18:02
192.168.10.1 110 00:18:10
Distance: (default is 110)
Routing Protocol is "ospf 2"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 10.10.10.1
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
Maximum path: 4
--More--
Copy
Paste
Top
172.16.0.1
192.168.10.1
Router-PT
Router0
172.16.0.2
10.0.0.1
Router-PT
10.10.10.1
Router1
PC-PT
PC0
192.168.10.2
PC-PT
PC1
192.168.10.3
PC-PT
PC2
10.10.10.2
PC-PT
PC3
10.10.10.3
192.168.10.0
10.10.10.0
OSFF MULTI-AREA
Realtime
Simulation

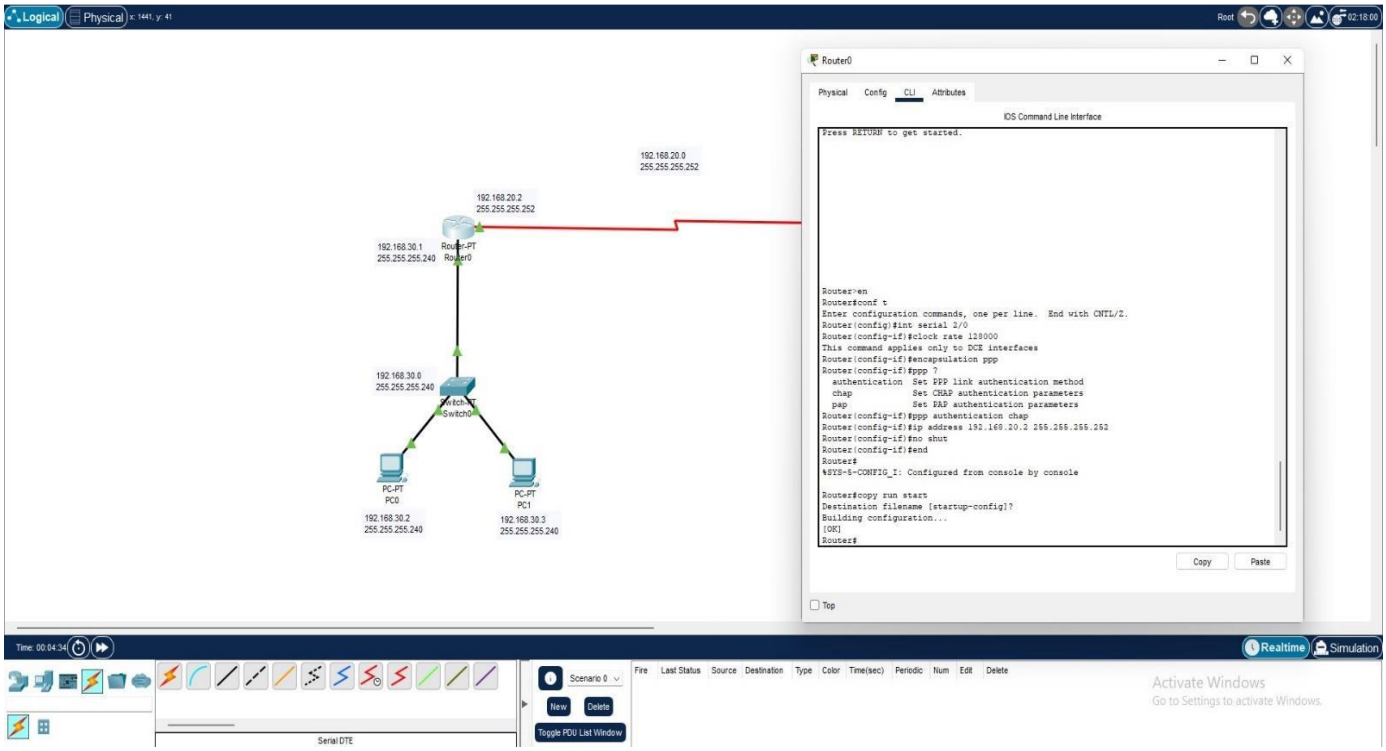

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
63488K bytes of ATA CompactFlash (Read/Write)
Press RETURN to get started!
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 2
Router(config-router)#network 10.0.0.0 255.255.255.0 area 1
Router(config-router)#network 192.168
00:10:17: %OSPF-5-ADJCHG: Process 2, Nbr 10.10.10.1 on Serial3/0 from LOADING to FULLnen
Router(config-router)#network 192.168.0.0 255.255.255.0 area 1
Router(config-router)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Copy
Paste
Top
10.0.0.2
Router2
192.168.0.1
PC4
192.168.0.2
PC5
192.168.0.3
192.168.0.0
OSPF MULTI- AREA
Logical
Physical
Root
Realtime
Simulation

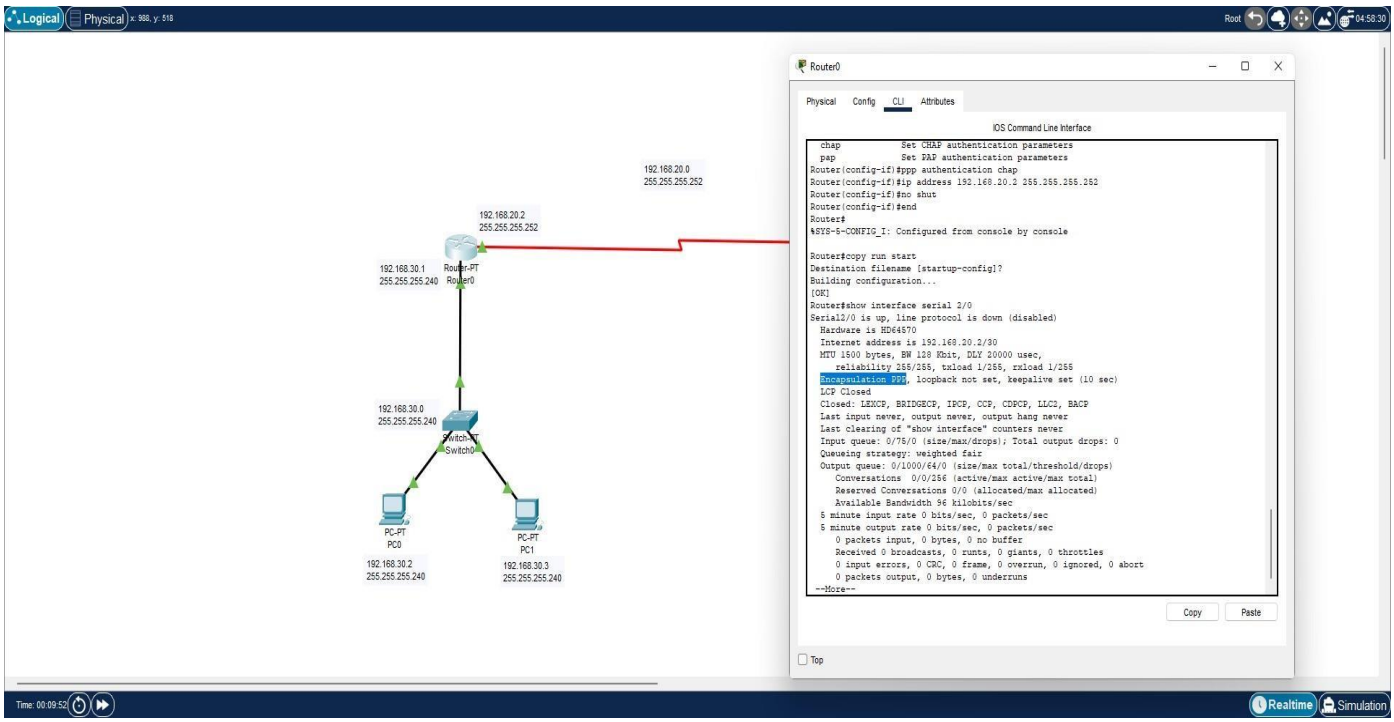

Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip protocols
Routing Protocol is "ospf 2"
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Router ID 192.168.0.1
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Maximum path: 4
Routing for Networks:
10.0.0.0 0.0.0.255 area 1
192.168.0.0 0.0.0.255 area 1
Routing Information Sources:
Gateway Distance Last Update
10.10.10.1 110 00:10:35
192.168.0.1 110 00:08:34
Distance: (default is 110)
Router#
Copy
Paste
Top
10.0.0.1
Router1
10.10.10.1
PC3
10.10.10.3
10.10.10.0
10.0.0.2
Router2
192.168.0.1
PC4
192.168.0.2
PC5
192.168.0.3
192.168.0.0
OSPF MULTI- AREA
Logical
Physical
Root
Realtime
Simulation

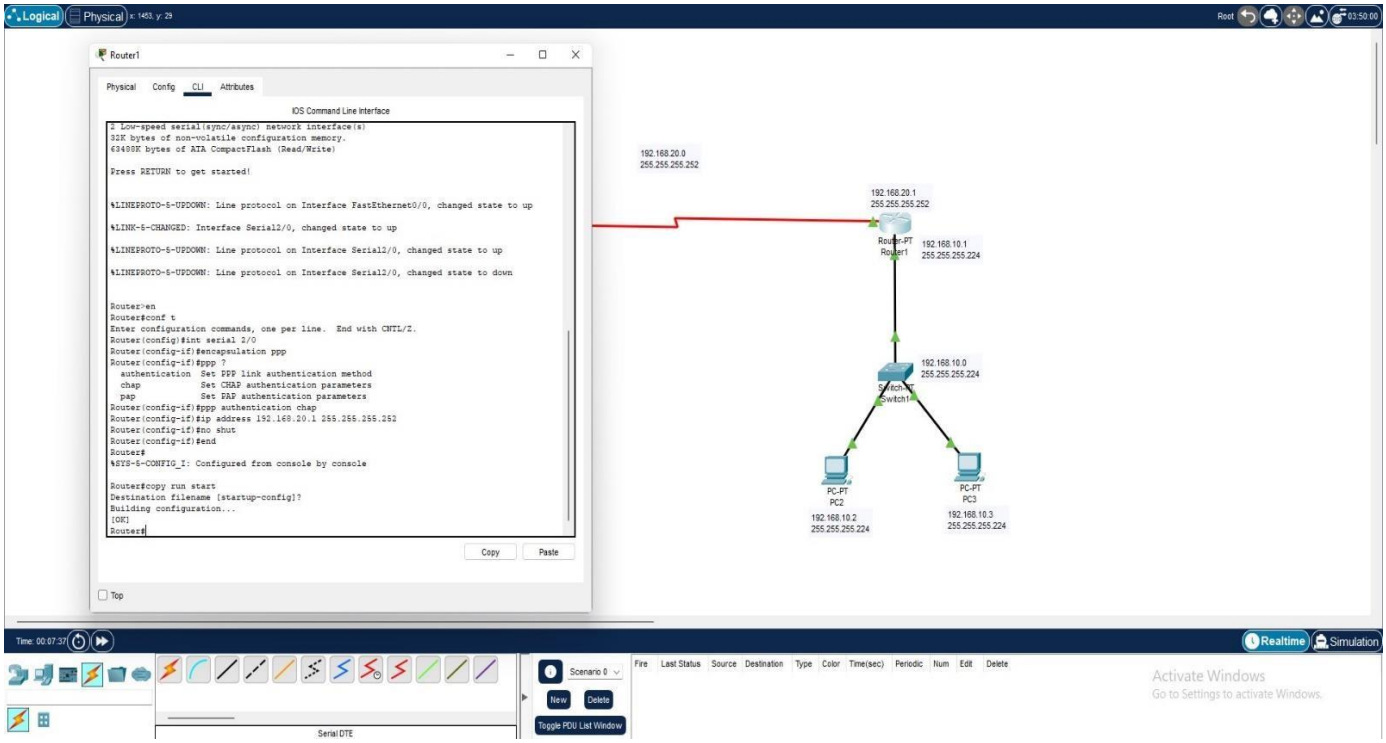
Lab 11: PPP Configuration

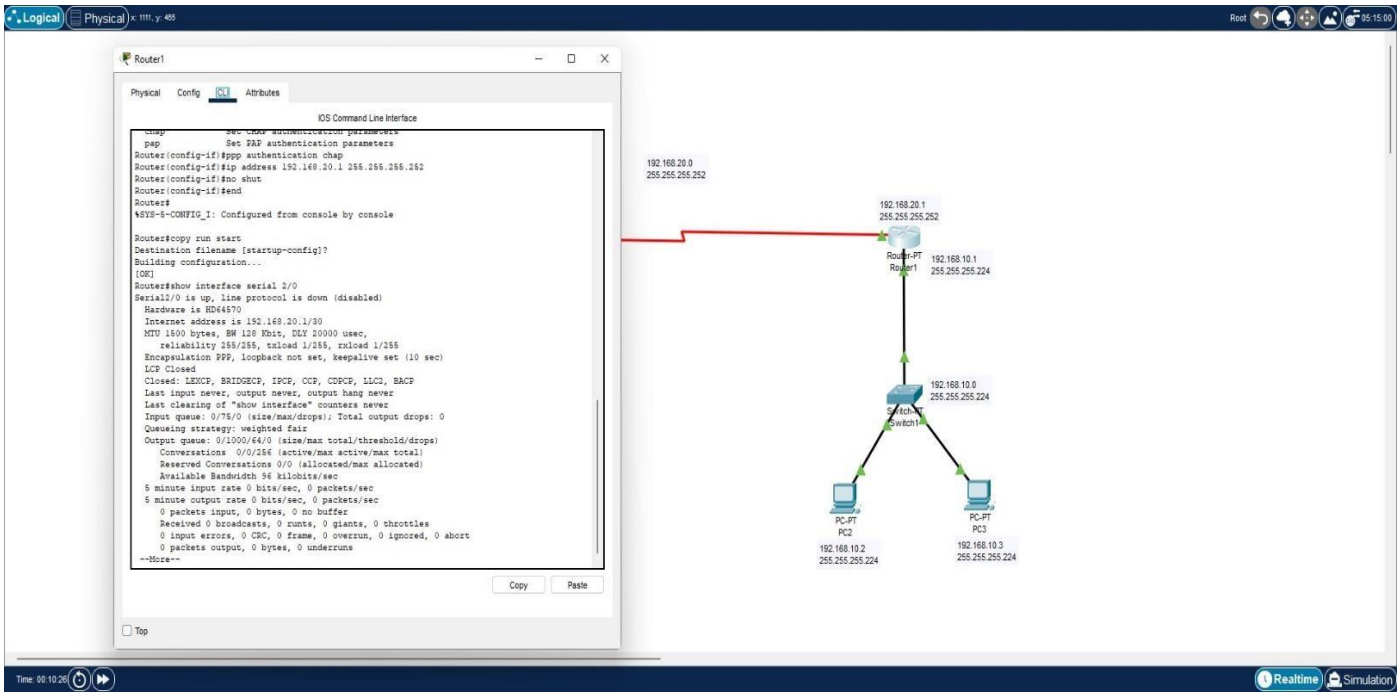
- **Procedure:**
    1. Open Packet Tracer:
    ■ Launch Cisco Packet Tracer on your computer.
    2. Create a Network:
    ■ Drag two routers onto the workspace and connect them using a serial connection.
    ■ Connect a computer to each router using Ethernet cables.
    3. Configure IP Addresses:
    ■ Assign IP addresses to each interface on the routers and computers.
    4. Configure PPP:
    ■ Access the CLI of each router.
    ■ Enter interface configuration mode for the serial interface: interface serial 0/0/0.
    ■ Enable PPP encapsulation: encapsulation ppp.
    5. Test Connectivity:
    ■ Use the ping command to test connectivity between the computers.




Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int serial 2/0
Router(config-if)#clock rate 128000
This command applies only to DCE interfaces
Router(config-if)#encapsulation ppp
Router(config-if)#ppp ?
authentication Set PPP link authentication method
chap Set CHAP authentication parameters
pap Set PAP authentication parameters
Router(config-if)#ppp authentication chap
Router(config-if)#ip address 192.168.20.2 255.255.255.252
Router(config-if)#no shut
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.2
255.255.255.252
192.168.30.1
255.255.255.240
Router-PT
Router0
192.168.30.0
255.255.255.240
Switch-PT
Switch0
PC-PT
PC0
PC-PT
PC1
192.168.30.2
255.255.255.240
192.168.30.3
255.255.255.240
Time: 00:04:34
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Serial DTE
Activate Windows
Go to Settings to activate Windows.

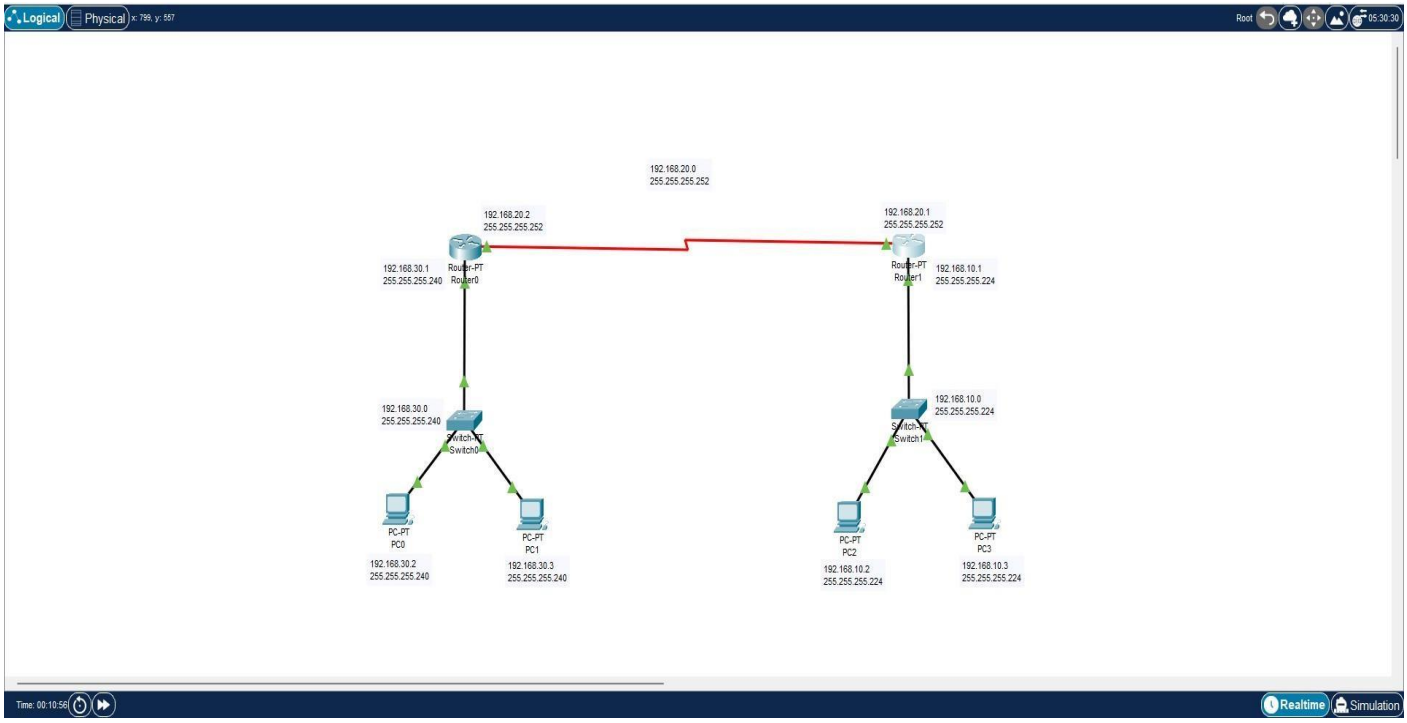

Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
chap Set CHAP authentication parameters
pap Set PAP authentication parameters
Router(config-if)#ppp authentication chap
Router(config-if)#ip address 192.168.20.2 255.255.255.252
Router(config-if)#no shut
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show interface serial 2/0
Serial2/0 is up, line protocol is down (disabled)
Hardware is HD64570
Internet address is 192.168.20.2/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set, keepalive set (10 sec)
LCP Closed
Closed: LEXCP, BRIDGECP, IPCP, CCP, CDPCP, LLC2, BACP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
--More--
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.2
255.255.255.252
192.168.30.1
255.255.255.240
Router-PT
Router0
192.168.30.0
255.255.255.240
Switch-PT
Switch0
PC-PT
PC0
PC-PT
PC1
192.168.30.2
255.255.255.240
192.168.30.3
255.255.255.240
Time: 00:09:53
Realtime
Simulation

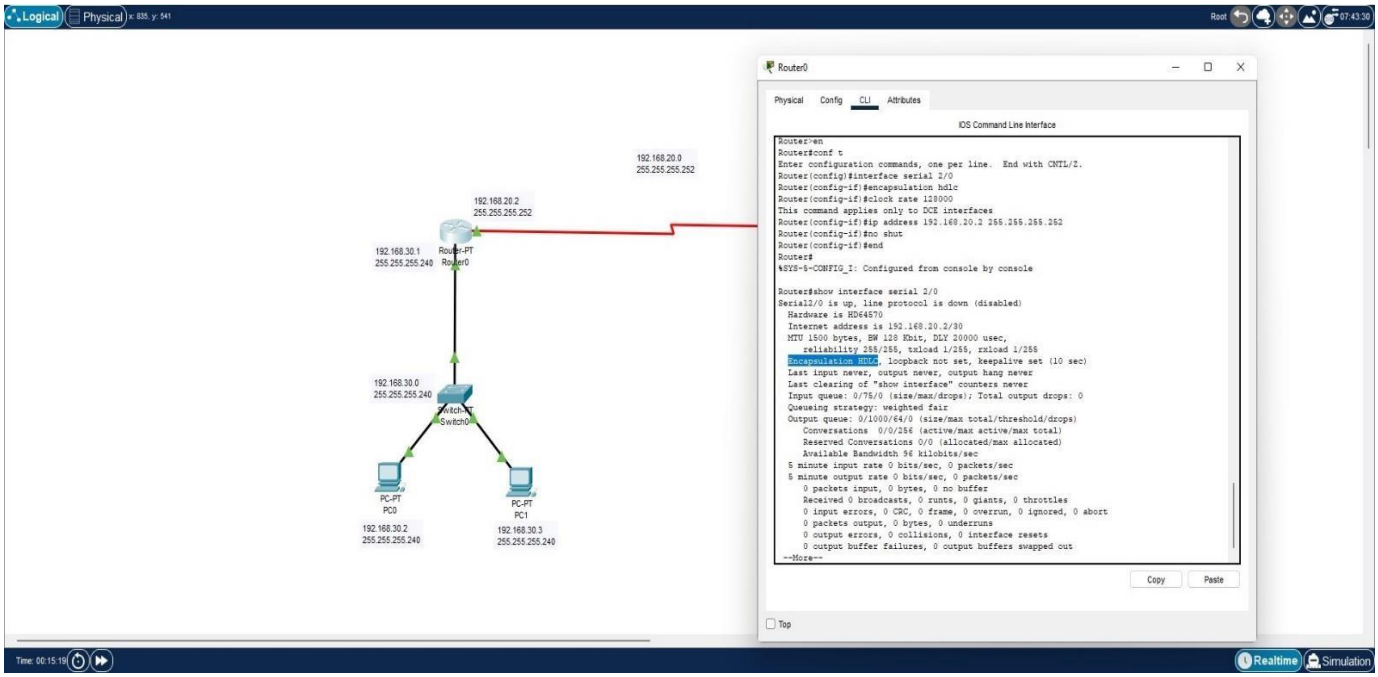

Logical
Physical
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)
Press RETURN to get started!
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to down
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int serial 2/0
Router(config-if)#encapsulation ppp
Router(config-if)#ppp ?
authentication Set PPP link authentication method
chap Set CHAP authentication parameters
pap Set PAP authentication parameters
Router(config-if)#ppp authentication chap
Router(config-if)#ip address 192.168.20.1 255.255.255.252
Router(config-if)#no shut
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.1
255.255.255.252
Router-PT
Router1
192.168.10.1
255.255.255.224
192.168.10.0
255.255.255.224
Switch-PT
Switch1
PC-PT
PC2
192.168.10.2
255.255.255.224
PC-PT
PC3
192.168.10.3
255.255.255.224
Time: 00:07:37
Realtime
Simulation
Serial DTE
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Activate Windows
Go to Settings to activate Windows.

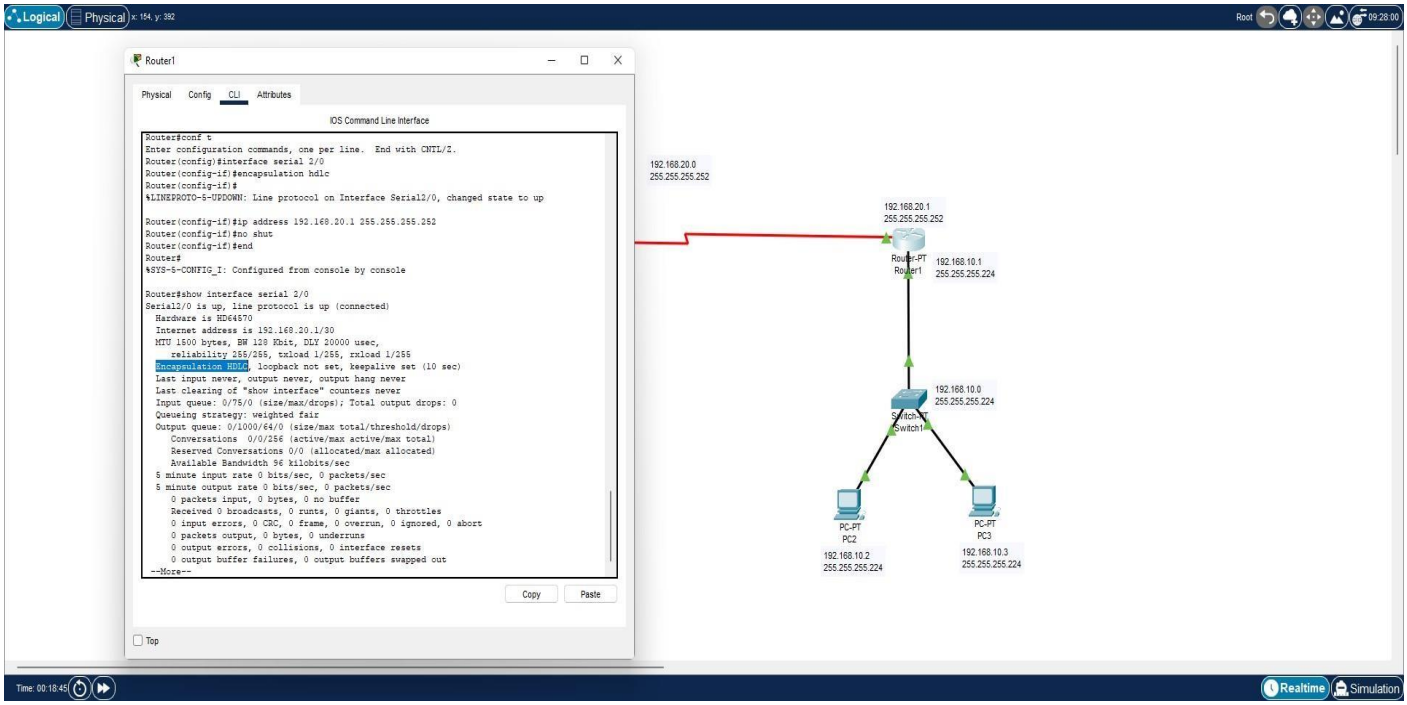

Logical
Physical
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
pap Set PAP authentication parameters
Router(config-if)#ppp authentication chap
Router(config-if)#ip address 192.168.20.1 255.255.255.252
Router(config-if)#no shut
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Router#show interface serial 2/0
Serial2/0 is up, line protocol is down (disabled)
Hardware is HD64570
Internet address is 192.168.20.1/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set, keepalive set (10 sec)
LCP Closed
Closed: LEXCP, BRIDGECP, IPCP, CCP, CDPCP, LLC2, BACP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
--More--
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.1
255.255.255.252
Router-PT
Router1
192.168.10.1
255.255.255.224
192.168.10.0
255.255.255.224
Switch-PT
Switch1
PC-PT
PC2
192.168.10.2
255.255.255.224
PC-PT
PC3
192.168.10.3
255.255.255.224
Time: 00:10:26
Realtime
Simulation

Lab 12: HDLC Configuration

- **Procedure:**
    1. Open Packet Tracer:
    ■ Launch Cisco Packet Tracer on your computer.
    2. Create a Network:
    ■ Drag two routers onto the workspace and connect them using a serial connection.
    ■ Connect a computer to each router using Ethernet cables.
    3. Configure IP Addresses:
    ■ Assign IP addresses to each interface on the routers and computers.
    4. Configure HDLC:
    ■ Access the CLI of each router.
    ■ Enter interface configuration mode for the serial interface: interface serial 0/0/0.
    ■ Enable HDLC encapsulation: encapsulation hdlc.
    5. Test Connectivity:
    ■ Use the ping command to test connectivity between the computers.

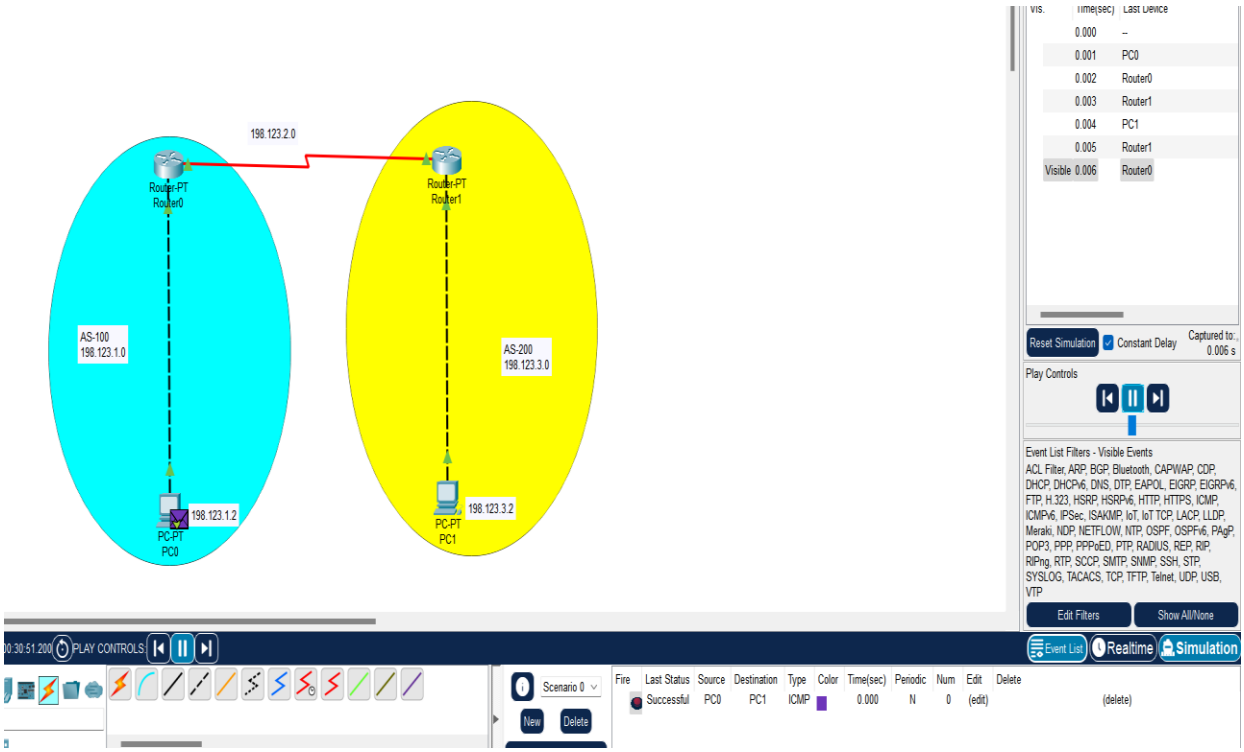



Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#encapsulation hdlc
Router(config-if)#clock rate 128000
This command applies only to DCE interfaces
Router(config-if)#ip address 192.168.20.2 255.255.255.252
Router(config-if)#no shut
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show interface serial 2/0
Serial2/0 is up, line protocol is down (disabled)
Hardware is HD64570
Internet address is 192.168.20.2/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffer failures, 0 output buffers swapped out
--More--
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.2
255.255.255.252
192.168.30.1
255.255.255.240
Router-PT
Router0
192.168.30.0
255.255.255.240
Switch-PT
Switch0
PC-PT
PC0
PC-PT
PC1
192.168.30.2
255.255.255.240
192.168.30.3
255.255.255.240
Time: 00:15:19
Realtime
Simulation


Logical
Physical
Root
Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial 2/0
Router(config-if)#encapsulation hdlc
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#ip address 192.168.20.1 255.255.255.252
Router(config-if)#no shut
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show interface serial 2/0
Serial2/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 192.168.20.1/30
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 output buffer failures, 0 output buffers swapped out
--More--
Copy
Paste
Top
192.168.20.0
255.255.255.252
192.168.20.1
255.255.255.252
Router-PT
Router1
192.168.10.1
255.255.255.224
192.168.10.0
255.255.255.224
Switch-PT
Switch1
PC-PT
PC2
PC-PT
PC3
192.168.10.2
255.255.255.224
192.168.10.3
255.255.255.224
Time: 00:18:45
Realtime
Simulation

Lab 13: Implementation of BGP

- **Procedure:**
  1. Open Packet Tracer:
  ■ Launch Cisco Packet Tracer on your computer.
  2. Create a Network:
  ■ Drag two routers onto the workspace and connect them to form separate autonomous systems (AS).
  ■ Connect a computer to each router using Ethernet cables.
  3. Configure IP Addresses:
  ■ Assign IP addresses to each interface on the routers and computers.
  4. Enable BGP:
  ■ Access the CLI of each router.
  ■ Enable BGP on each router: router bgp <AS number>.
  ■ Establish BGP peering: neighbor <IP address> remote-as <AS number>.
  ■ Advertise connected networks: network <network address>.
  5. Test Connectivity:
  ■ Use the ping command to test connectivity between the computers.

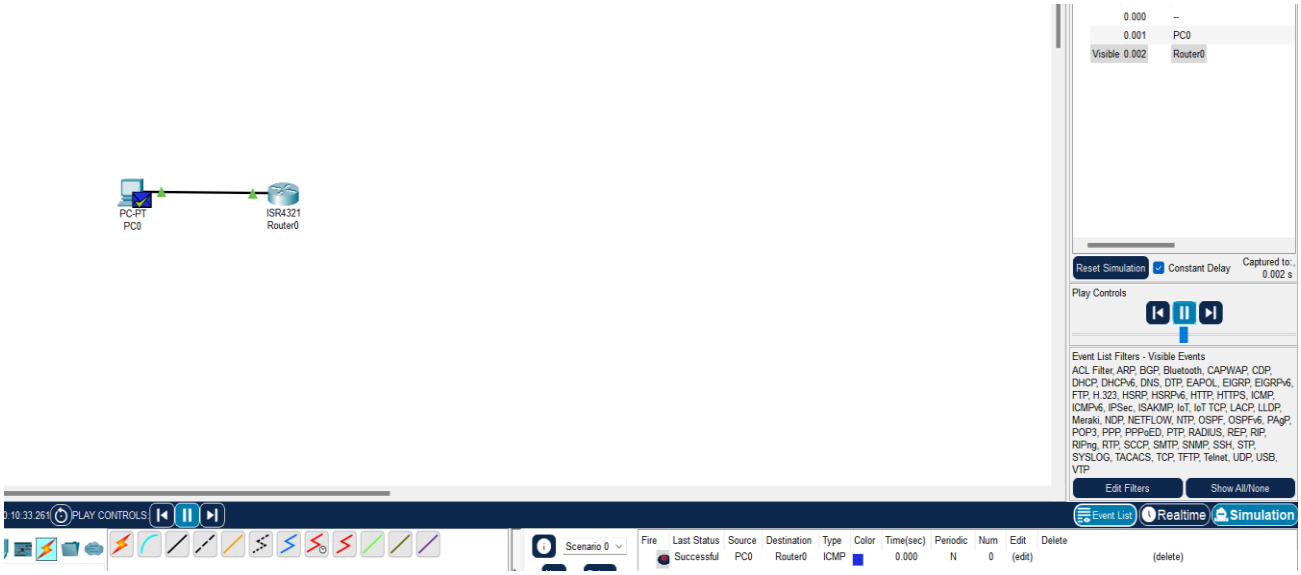


Lab 14: Implementation of EIGRP

- **Procedure:**
    1. Open Packet Tracer:
    - Launch Cisco Packet Tracer on your computer.
    2. Create a Network:
    - Drag three routers onto the workspace and connect them in a triangular topology.
    - Connect a computer to each router using Ethernet cables.
    3. Configure IP Addresses:
    - Assign IP addresses to each interface on the routers and computers.
    4. Enable EIGRP:
    - Access the CLI of each router.
    - Enable EIGRP: router eigrp 1.
    - Advertise connected networks: network <network address>.
    5. Test Connectivity:
    - Use the ping command to test connectivity between the computers.

Lab 15: Telnet Configuration

- **Procedure:**
    1. Open Packet Tracer:
    - Launch Cisco Packet Tracer on your computer.
    2. Create a Network:
    - Drag a router and a computer onto the workspace.
    - Connect the computer to the router using an Ethernet cable.
    3. Configure IP Addresses:
    - Assign IP addresses to the router and computer.
    4. Enable Telnet:
    - Access the CLI of the router.
    - Enter global configuration mode: enable, configure terminal.
    - Enable Telnet: line vty 0 4, password cisco, login.
    5. Test Telnet Connectivity:
    - Use the Command Prompt on the computer to connect to the router using Telnet: telnet <router IP address>.


PC-PT
PC0
ISR4321
Router0
0.000 --
0.001 PC0
Visible 0.002 Router0
Reset Simulation
Constant Delay
Captured to:
0.002 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
PLAY CONTROLS:
Event List
Realtime
Simulation
Scenario 0
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC0 Router0 ICMP 0.000 N 0 (edit) (delete)