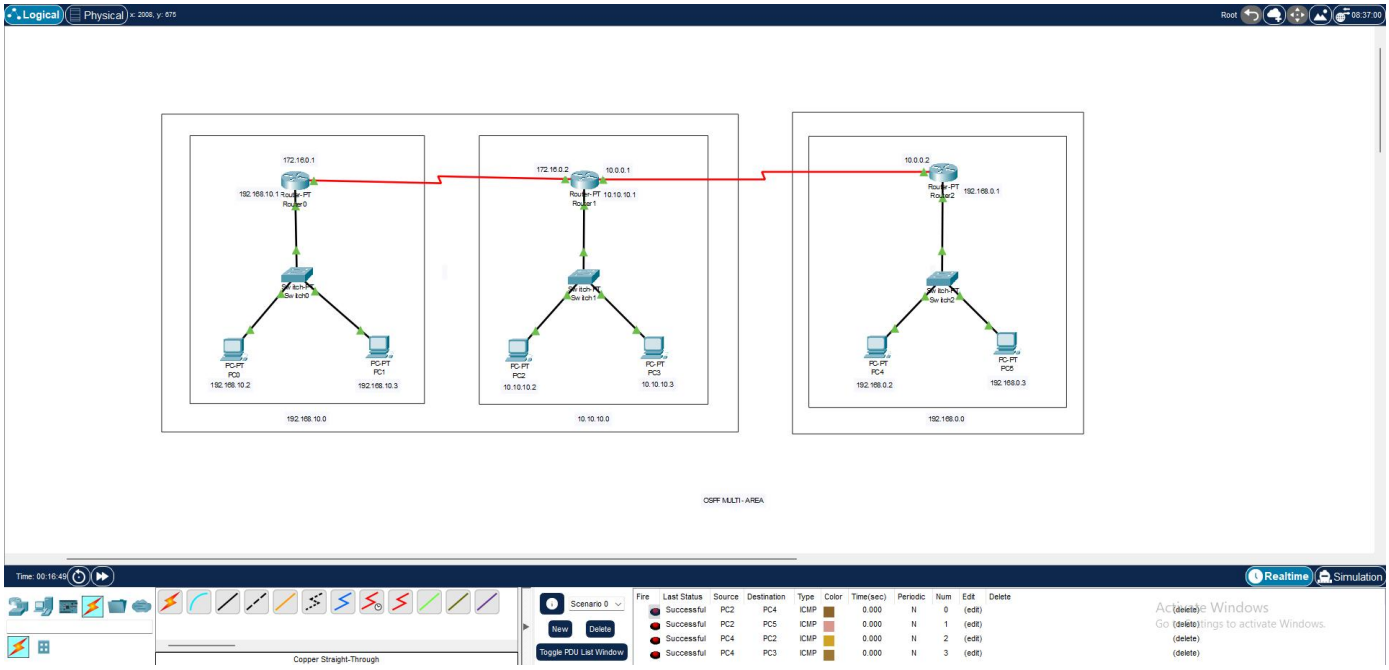
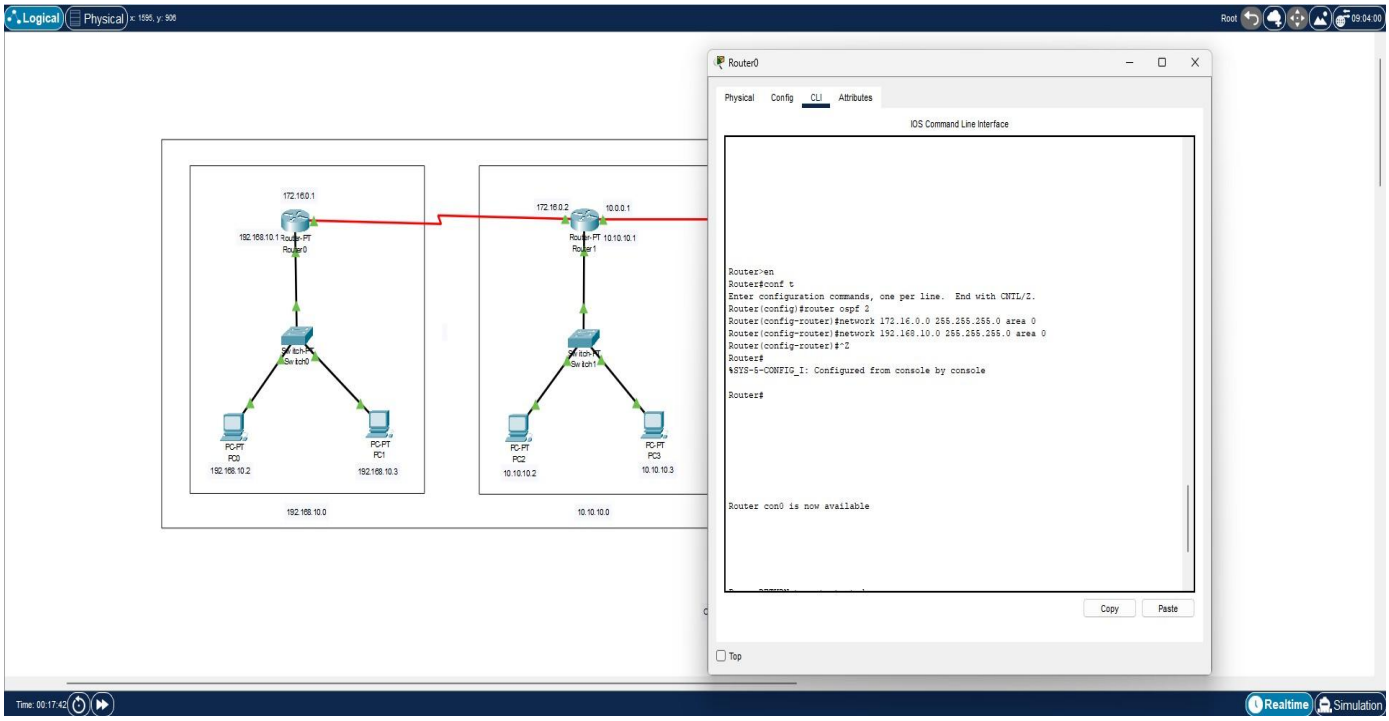
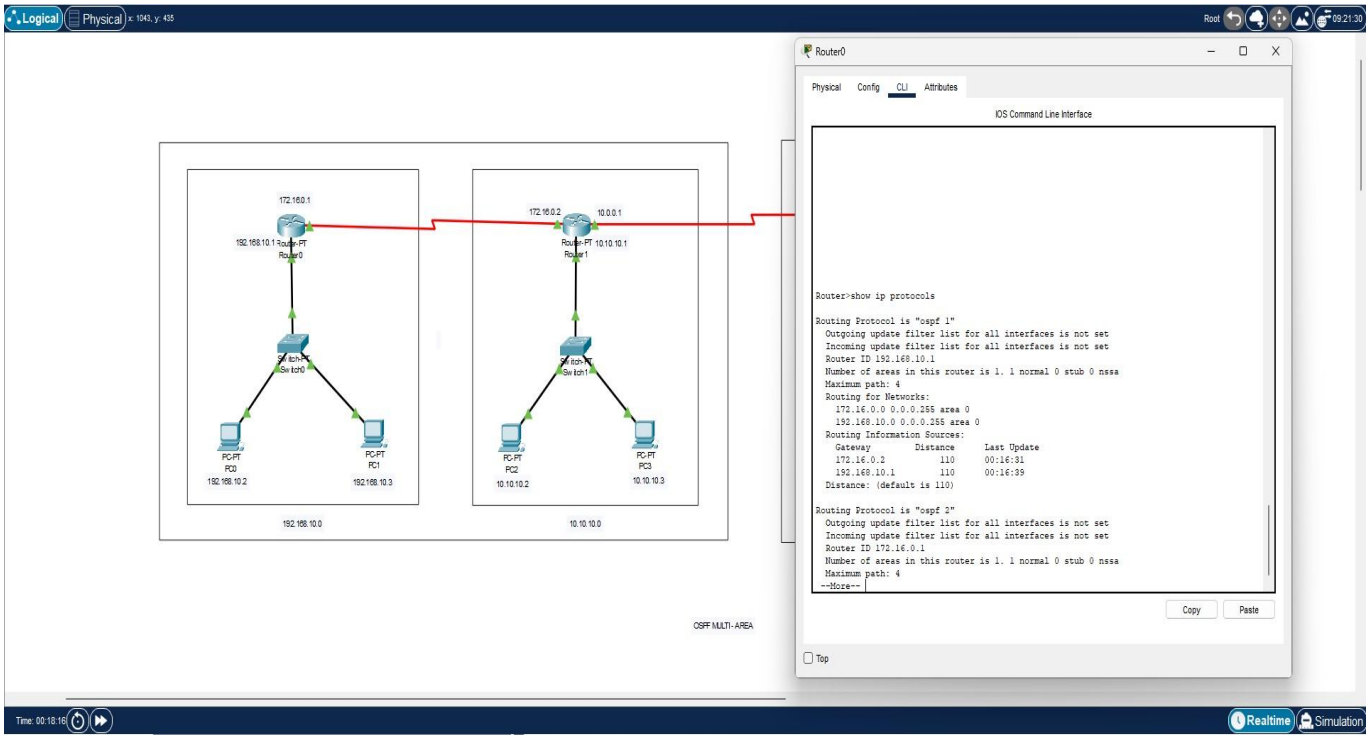
CN Lab 10: Implementation of Multi Area OSPF

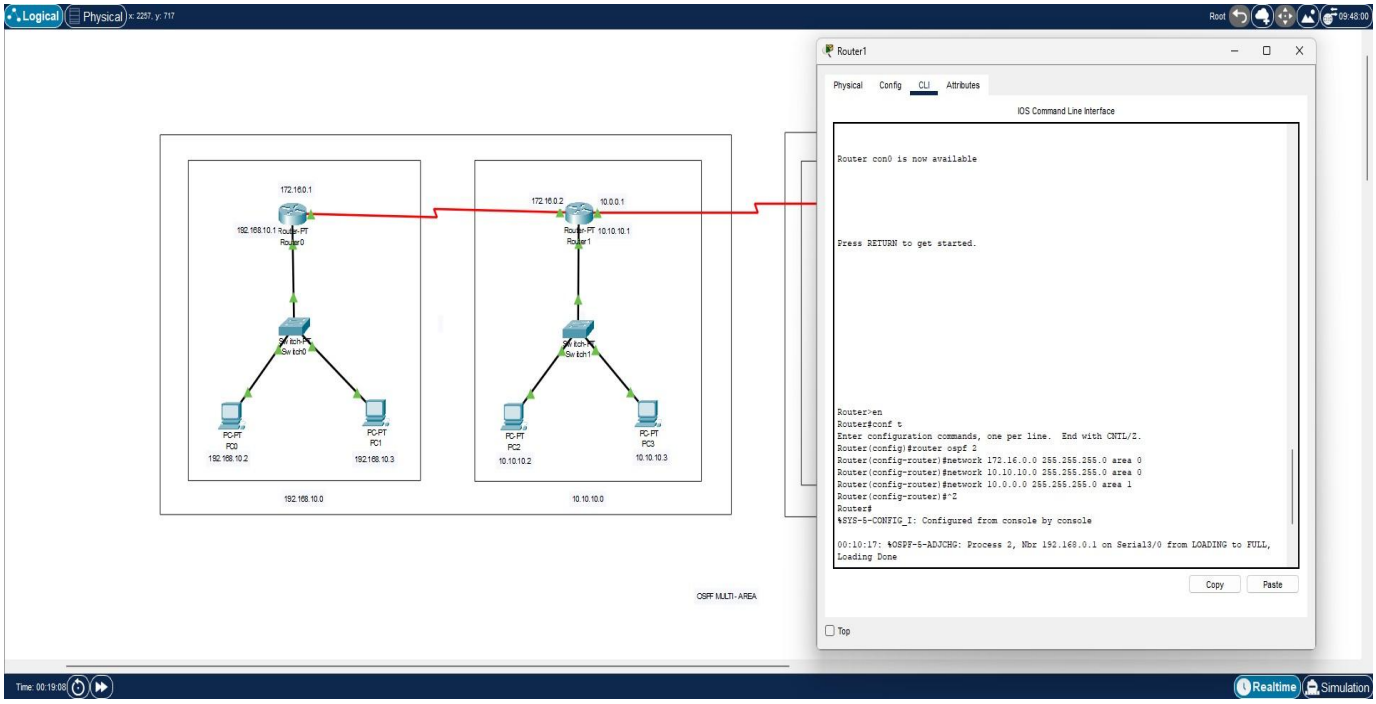
- **Procedure:**
    1. **Open Packet Tracer:**
        - Launch Cisco Packet Tracer on your computer.
    2. **Create a Network:**
        - Drag four routers onto the workspace and connect them to form two separate OSPF areas with an Area 0 backbone.
        - Connect a computer to each router using 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.

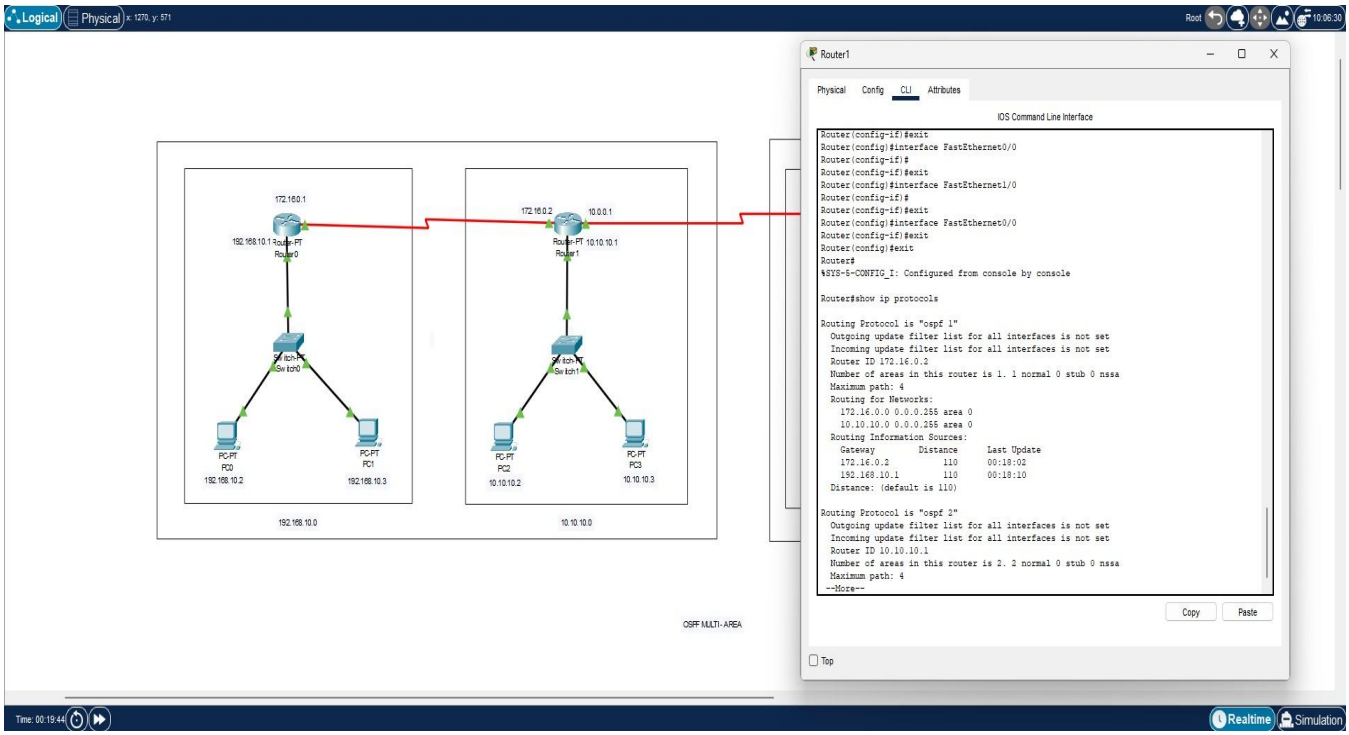
Output:

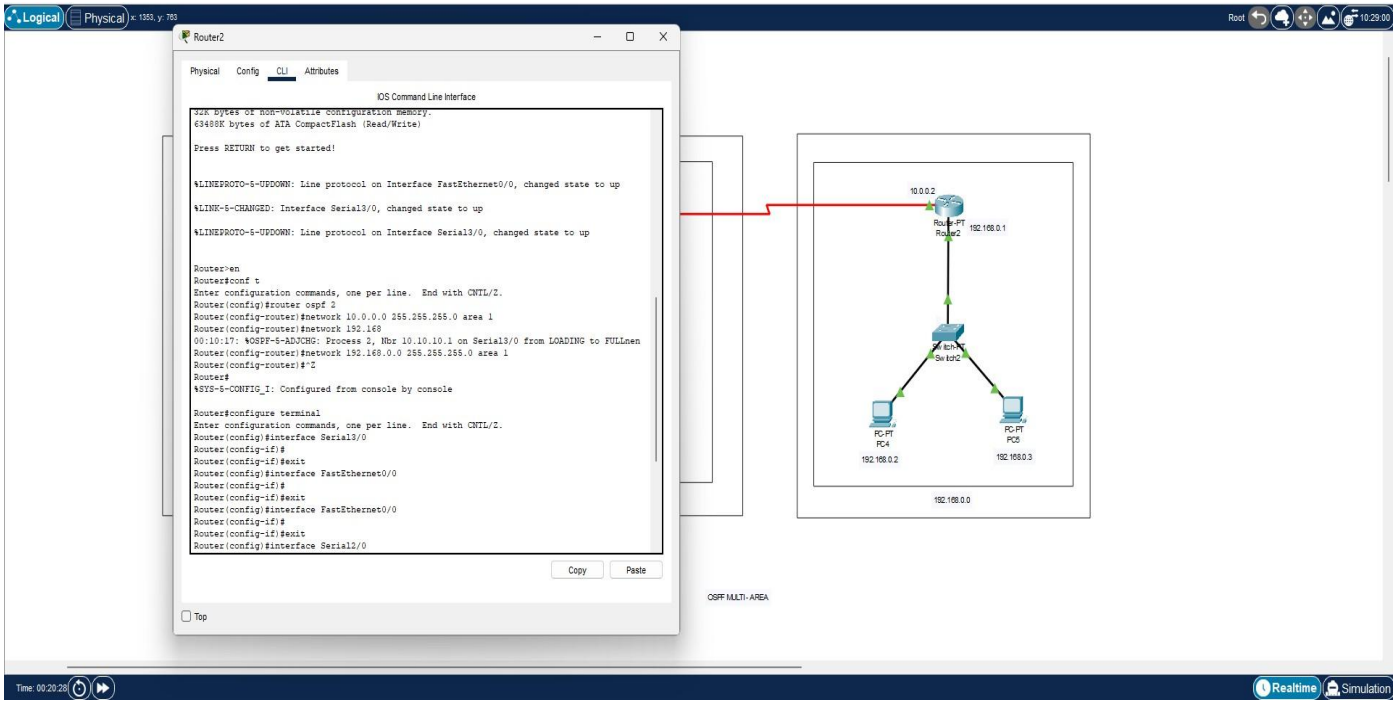


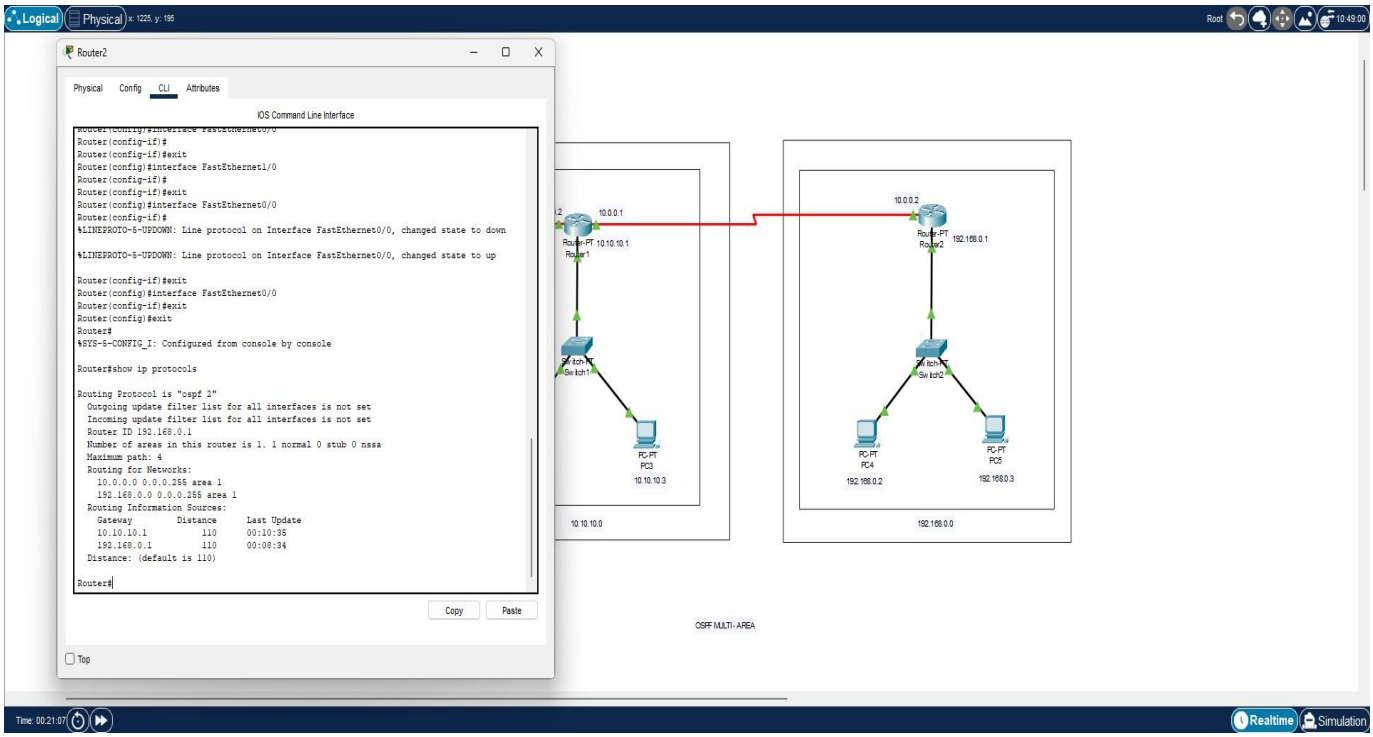

Logical
Physical
Root
Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 2
Router(config-router)#network 172.16.0.0 255.255.255.0 area 0
Router(config-router)#network 192.168.10.0 255.255.255.0 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
Router0
172.16.0.2
10.0.0.1
Router1
10.10.10.1
PC0
192.168.10.2
PC1
192.168.10.3
PC2
10.10.10.2
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
Root
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
Time: 00:19:08
Realtime
Simulation


Logical
Physical
Root
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
Time: 00:19:44
Realtime
Simulation


Logical
Physical
Root
Router2
Physical
Config
CLI
Attributes
IOS Command Line Interface
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 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
Time: 00:20:28
Realtime
Simulation


Logical
Physical
Root
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
Time: 00:21:07
Realtime
Simulation