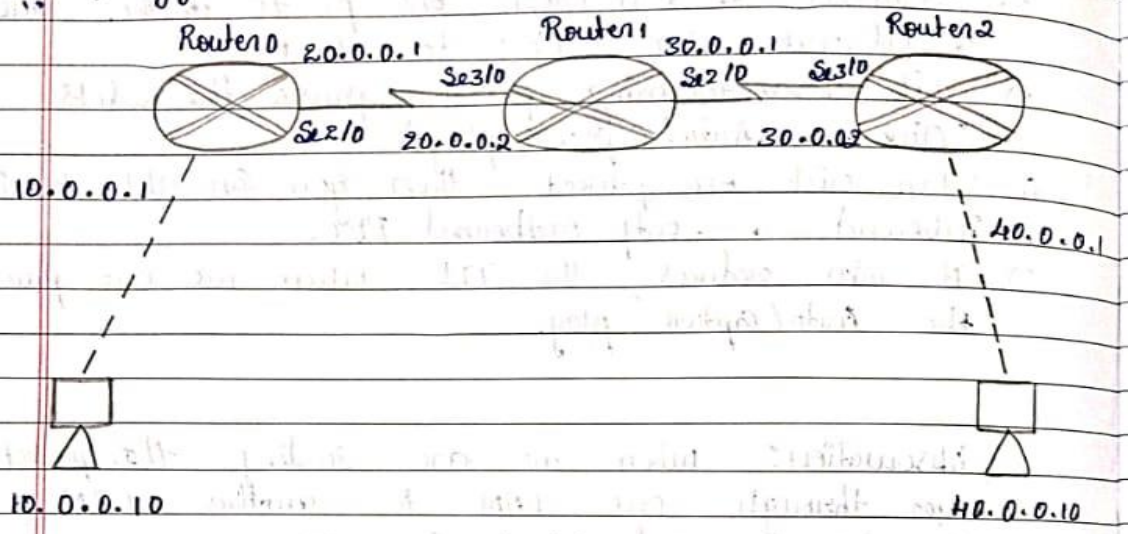
LAB – 7

Configure OSPF routing protocol.

LAB-07

AIM: How to configure OSPF Routing Protocol & Connect Areas.

Topology:



Step1: Create a topology like above I have given

Step2: Configure ip address to all interfaces.

In Router R1

interface fastethernet 2/0
ip address 10.0.0.1 255.0.0.0
no shutdown
interface Serial 1/0
ip address 20.0.0.1 255.0.0.0
encapsulation ppp
clock rate 64000
no shutdown

In Router R2

interface Serial 1/0
ip address 20.0.0.2 255.0.0.0

encapsulation ppp
no Shutdown
interface Serial 1/1
ip address 30.0.0.1 255.0.0.0
encapsulation ppp
clock rate 64000
no Shutdown

In Router R3
Interface Serial 1/0
ip address 30.0.0.2 255.0.0.0
encapsulation ppp
no Shutdown
interface fastethernet 2/0
ip address 40.0.0.1 255.0.0.0
no Shutdown

Step3 : Now, Enable ip routing by Conflicting Configuring ospf routing protocol in all routers

In Router 1
router ospf 1
router id 1.1.1.1
network 10.0.0.0 0.255.255.255 area 3
network 20.0.0.0 0.255.255.255 area 1

In Router 2
router ospf 1
router-id 2.2.2.2
network 20.0.0.0 0.255.255.255 area 1
network 30.0.0.0 0.255.255.255 area 0

In Router R3
router ospf 1
router-id 3.3.3.3
network 30.0.0.0 0.255.255.255 area 0
network 40.0.0.0 0.255.255.255 area 2

Step 4: Now check routing table of R1
In Router1
→ show ip route

Step 5: Now check Routing table of R3.
→ show ip route.

Step 6: Create virtual link between R1, R2 by this we create a virtual link to connect area 3 to area 0.
In Router 1
router ospf 1
area 1 virtual-link 2.2.2.2

In Router 2
router ospf 1
area 1 virtual-link 1.1.1.1

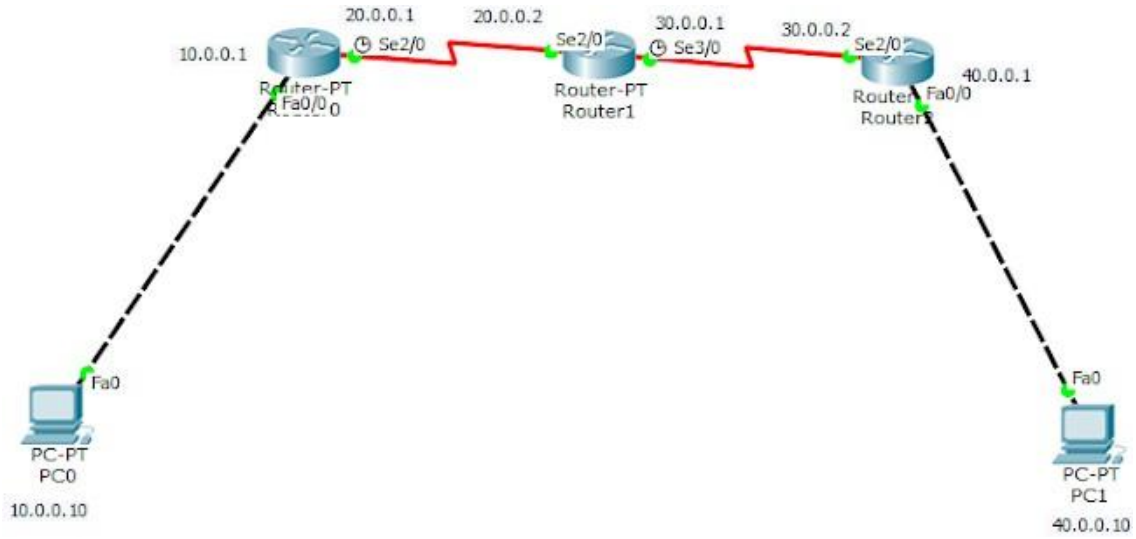
Step 7: R2 & R3 get updates about Area 3 Now, check routing table of R3.
In Router R3
→ show ip route.

Step 8: Check Connectivity between host 10.0.0.10 to 40.0.0.10

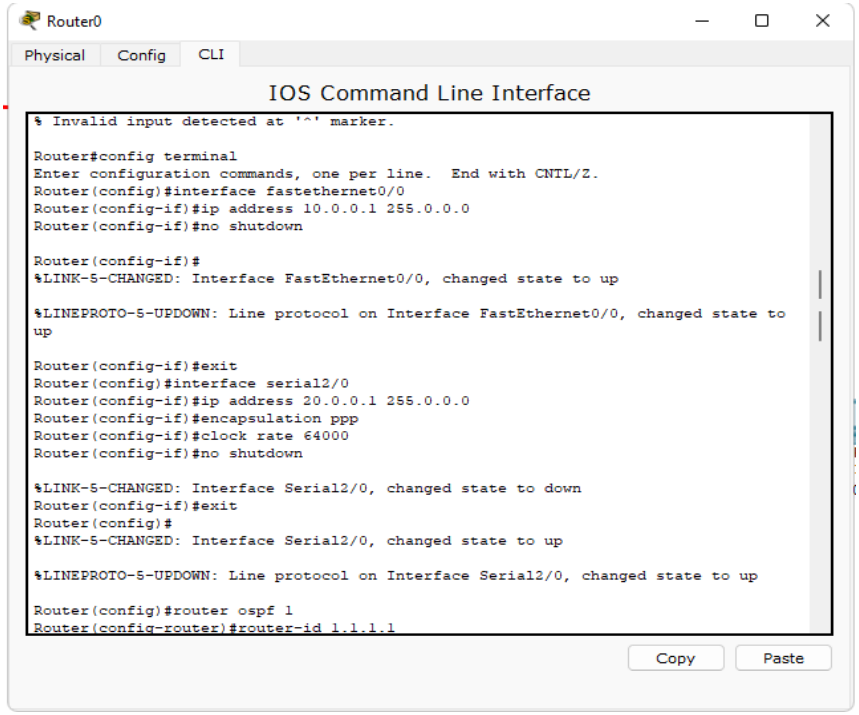
Observation: observation about Configuring the OSPF routing protocol & connecting areas typically focus on its hierarchical structure, performance & scalability.

07/12/24

TOPOLOGY:



OUTPUT:



Router0

Physical | Config | CLI

IOS Command Line Interface

```
%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
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.2/32 is directly connected, Serial2/0
O IA 30.0.0.0/8 [110/128] via 20.0.0.2, 00:16:57, Serial2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:15:31, Serial2/0
C    172.16.0.0/16 is directly connected, Loopback0
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#area 1 virtual-link 2.2.2.2
Router(config-router)#
Router(config-router)#
00:42:03: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on OSPF_VL0 from LOADING to FULL,
Loading Done

Router(config-router)#
```

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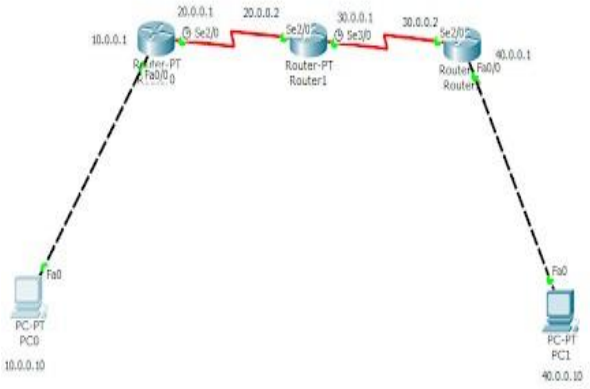

PC0

Physical | Config | Desktop | Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Request timed out.
Reply from 40.0.0.10: bytes=32 time=4ms TTL=126
Reply from 40.0.0.10: bytes=32 time=7ms TTL=126
Reply from 40.0.0.10: bytes=32 time=9ms TTL=126

Ping statistics for 40.0.0.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 9ms, Average = 7ms

PC>
```