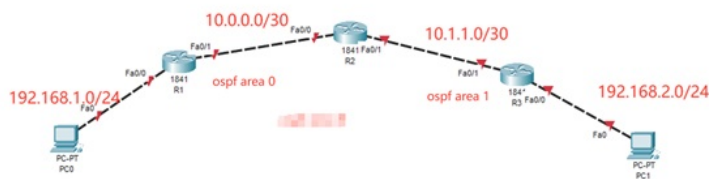


组网及说明



组网说明:

本案例采用思科模拟器的路由器来实现OSPF STUB的典型组网需求,在该网络中, R1、R2属于区域0、R3与R2属于区域1,通过配置OSPF实现PC之间的业务互通。同时将区域1配置为STUB,实现对路由的优化。

知识穿插:

当配置OSPF Stub区域后,Stub区域中的路由器会增加一条至ABR的默认路由条目,当在ABR上配置了完全末梢区域后,末梢区域的其他路由器的路由条目除了直连的路由条目外,只有一条到达ABR的路由条目默认路由,不会学习其他区域的路由条目,到其他区域的数据包通过ABR转发。这样减少了末梢区域其他路由器的路由条目和路由传递的数量,提高路由器的性能。

配置步骤

- 1、按照网络拓扑图配置IP地址。
- 2、分别配置R1、R2、R3的OSPF,同时将区域1配置为STUB区域,在R3配置为最终的STUB区域。
- 3、PC之间进行相互PING测试。

配置关键点

R1:

```
Router>ena
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hos R1
R1(config)#int f 0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#int f 0/1
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.0.0.0 0.0.0.3 area 0
R1(config-router)#network 192.168.1.0 0.0.0.255 area 0
R1(config-router)#exit
R1(config)#do wr
Building configuration...
[OK]
R1(config)#
```

R2:

```
Router>ena
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hos R2
R2(config)#int f 0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
```

```

R2(config)#int f 0/1
R2(config-if)#ip address 10.1.1.1 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#router ospf 1
R2(config-router)#network 10.0.0.0 0.0.0.3 area 0
R2(config-router)#network 10.1.1.0 0.0.0.3 area 1
R2(config-router)#area 1 stub
R2(config-router)#exit
R2(config)#do wr
Building configuration...
[OK]

```

```

R3:
Router>ena
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hos R3
R3(config)#int f 0/0
R3(config-if)#ip address 192.168.2.1 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#int f 0/1
R3(config-if)#ip address 10.1.1.2 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#router ospf 1
R3(config-router)#network 10.1.1.0 0.0.0.3 area 1
R3(config-router)#network 192.168.2.0 0.0.0.255 area 1
R3(config-router)#area 1 stub no-summary
R3(config-router)#exit
R3(config)#do wr
Building configuration...
[OK]

```

分别查看R1、R2、R3的OSPF邻居建立情况，均已经完成建立。

```

R1(config)#do sh ip ospf nei

```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.1.1.1	1	FULL/BDR	00:00:38	10.0.0.2	FastEthernet0/1

```

R1(config)#

```

```

R2(config)#do sh ip ospf nei

```

Neighbor ID	Pri	State	Dead Time	Address	Interface
192.168.1.1	1	FULL/DR	00:00:38	10.0.0.1	FastEthernet0/0
192.168.2.1	1	FULL/DR	00:00:37	10.1.1.2	FastEthernet0/1

```

R2(config)#

```

```

R3(config)#do sh ip ospf nei

```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.1.1.1	1	FULL/BDR	00:00:31	10.1.1.1	FastEthernet0/1

```

R3(config)#

```

分别查看R1、R2、R3的路由表，均已经学习到对端传递过来的路由。

```

R1#sh 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

    10.0.0.0/30 is subnetted, 2 subnets
    C    10.0.0.0 is directly connected, FastEthernet0/1
    O IA 10.1.1.0 [110/2] via 10.0.0.2, 00:13:19, FastEthernet0/1
    C    192.168.1.0/24 is directly connected, FastEthernet0/0
    O IA 192.168.2.0/24 [110/3] via 10.0.0.2, 00:00:25, FastEthernet0/1
R1#

```

```

R2(config-router)#do sh ip ro
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

    10.0.0.0/30 is subnetted, 2 subnets
    C    10.0.0.0 is directly connected, FastEthernet0/0
    C    10.1.1.0 is directly connected, FastEthernet0/1
    O    192.168.1.0/24 [110/2] via 10.0.0.1, 00:33:05, FastEthernet0/0
    O    192.168.2.0/24 [110/2] via 10.1.1.2, 00:01:07, FastEthernet0/1
R2(config-router)#

```

```

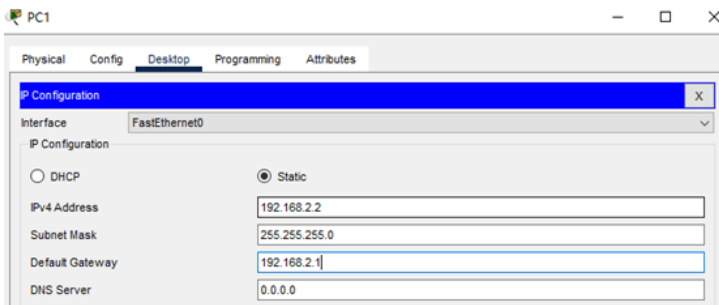
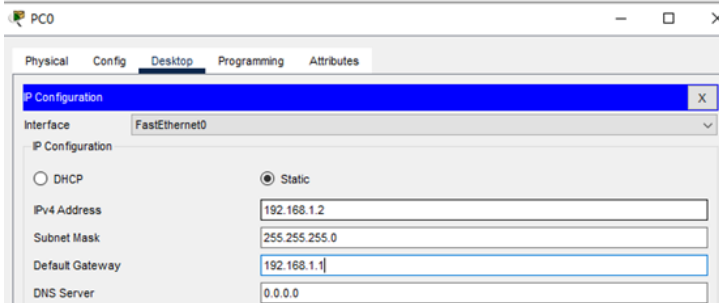
R3(config-router)#do sh ip ro
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 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 10.1.1.1 to network 0.0.0.0

    10.0.0.0/30 is subnetted, 2 subnets
    O IA 10.0.0.0 [110/2] via 10.1.1.1, 00:01:24, FastEthernet0/1
    C    10.1.1.0 is directly connected, FastEthernet0/1
    O IA 192.168.1.0/24 [110/3] via 10.1.1.1, 00:01:24, FastEthernet0/1
    C    192.168.2.0/24 is directly connected, FastEthernet0/0
    O*IA 0.0.0.0/0 [110/2] via 10.1.1.1, 00:01:24, FastEthernet0/1
R3(config-router)#

```

PC分别填写IP地址，且能相互PING通。



PC0

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time<1ms TTL=125
Reply from 192.168.2.2: bytes=32 time<1ms TTL=125
Reply from 192.168.2.2: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=125
Reply from 192.168.1.2: bytes=32 time<1ms TTL=125
Reply from 192.168.1.2: bytes=32 time<1ms TTL=125
Reply from 192.168.1.2: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

至此，思科路由器OSPF STUB典型组网配置案例已完成！