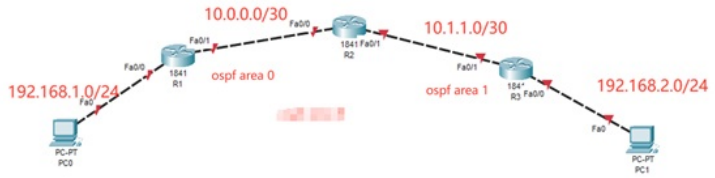
【MVS】思科路由器OSPF NSSA典型组网配置案例

网络相关 韦家宁 2024-07-03 发表

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 NSSA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NSSA，实现对路由的优化。

知识穿插：
自治系统外的ASE路由不可以进入到NSSA区域中，但是NSSA区域内的路由器引入的ASE路由可以在NSSA中传播并发送到区域之外。即：取消了STUB关于ASE的双向传播的限制（区域外的进不来，区域里的也出不去），改为单向限制（区域外的进不来，区域里的能出去）。

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NSSA区域，在R3配置为最终的NSSA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 nssa
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 nssa 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)#
```

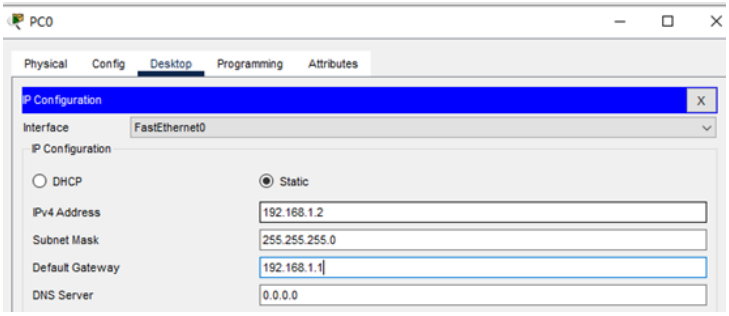
分别查看R1、R2、R3的路由表，均已经学习到对端传递过来的路由。

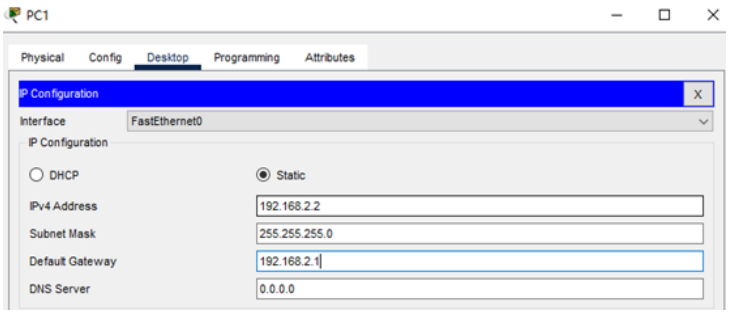
```
R1#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       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#
```

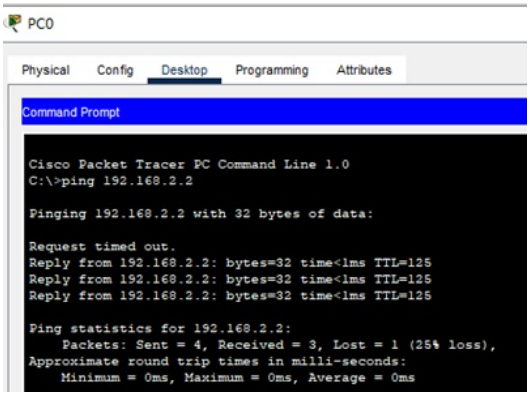
```
R2(config-router)#do sh ip ro
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 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)#
```

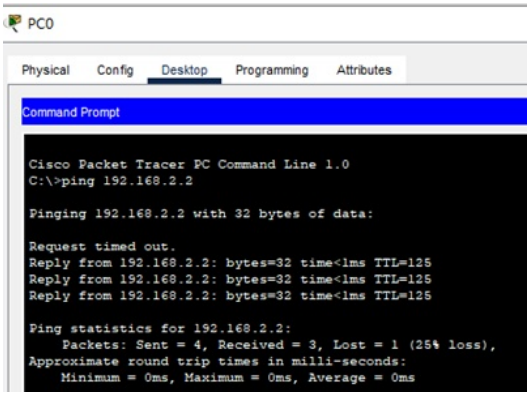
```
R3(config-router)#do sh ip ro
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 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 not set

     10.0.0.0/30 is subnetted, 2 subnets
O IA    10.0.0.0 [110/2] via 10.1.1.1, 00:00:24, 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, 00:00:24, FastEthernet0/1
C    192.168.2.0/24 is directly connected, FastEthernet0/0

R3(config-router)#
```

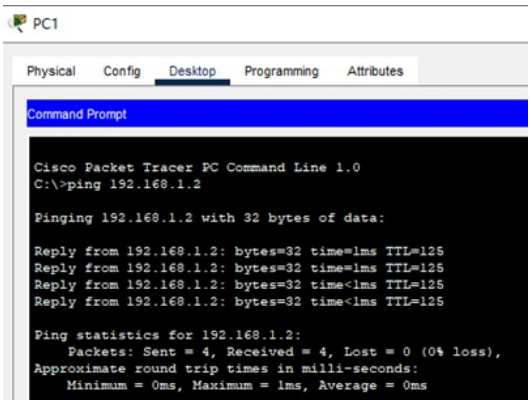
PC分别填写IP地址，且能相互PING通。











至此，思科路由器OSPF NSSA典型组网配置案例已完成！