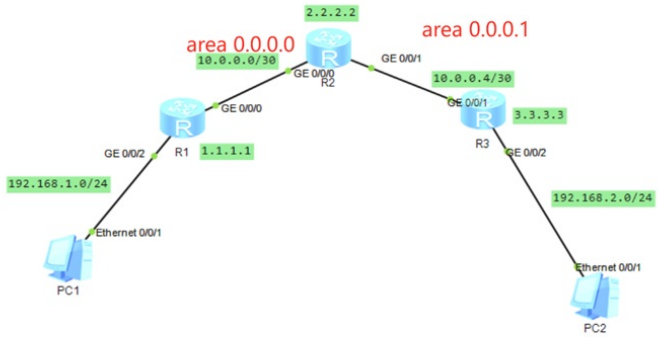
【MVS】华为路由器OSPF NSSA区域典型组网配置案例

网络相关 韦家宁 2024-01-16 发表

组网及说明



本案例采用ENSP模拟器来实现多区域OSPF的配置案例，IP地址规划在网络拓扑图中已经有了明确的标识，为了实现PC之间互通，使用多区域OSPF来实现，为了实现LSA的优化，本案例采用OSPF NSSA的方案来部署。

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路由器的多区域OSPF。

3、R2的区域1配置为NSSA区域。

4、R3的区域1配置为NSSA最终区域。

配置关键点

R1：

```
<Huawei>u t m
Info: Current terminal monitor is off.
<Huawei>u t d
Info: Current terminal debugging is off.
<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R1
[R1]int loopback 0
[R1-LoopBack0]ip address 1.1.1.1 32
[R1-LoopBack0]quit
[R1]int gi 0/0/2
[R1-GigabitEthernet0/0/2]ip address 192.168.1.1 24
[R1-GigabitEthernet0/0/2]quit
[R1]int gi 0/0/0
[R1-GigabitEthernet0/0/0]ip address 10.0.0.1 30
[R1-GigabitEthernet0/0/0]quit
[R1]ospf 1 router-id 1.1.1.1
[R1-ospf-1]area 0.0.0.0
[R1-ospf-1-area-0.0.0.0]network 10.0.0.0 0.0.0.3
[R1-ospf-1-area-0.0.0.0]network 192.168.1.0 0.0.0.255
[R1-ospf-1-area-0.0.0.0]network 1.1.1.1 0.0.0.0
[R1-ospf-1-area-0.0.0.0]quit
[R1-ospf-1]quit
```

R2：

```
<Huawei>u t m
Info: Current terminal monitor is off.
<Huawei>u t d
Info: Current terminal debugging is off.
<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R2
[R2]int loopback 0
[R2-LoopBack0]ip address 2.2.2.2 32
[R2-LoopBack0]quit
```

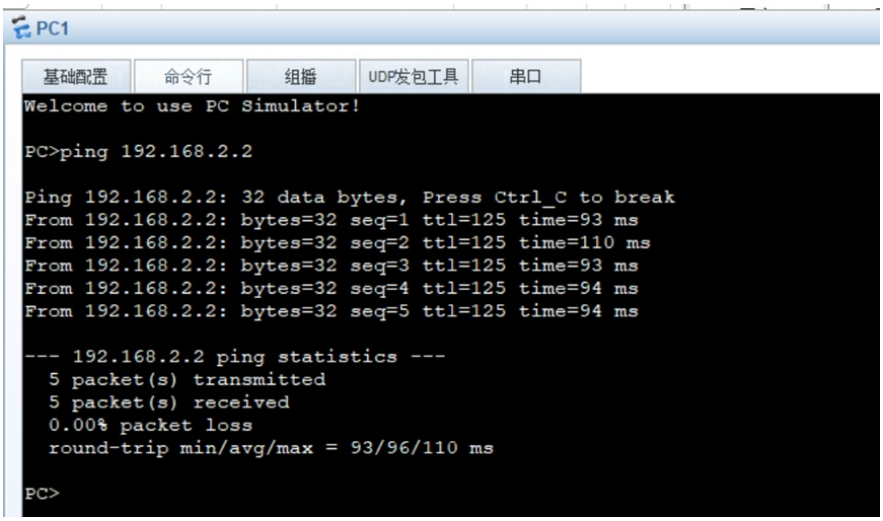
```
[R2]int gi 0/0/0
[R2-GigabitEthernet0/0/0]ip address 10.0.0.2 30
[R2-GigabitEthernet0/0/0]quit
[R2]int gi 0/0/1
[R2-GigabitEthernet0/0/1]ip address 10.0.0.5 30
[R2-GigabitEthernet0/0/1]quit
[R2]ospf 1 router-id 2.2.2.2
[R2-ospf-1]area 0.0.0.0
[R2-ospf-1-area-0.0.0.0]network 10.0.0.0 0.0.0.3
[R2-ospf-1-area-0.0.0.0]network 2.2.2.2 0.0.0.0
[R2-ospf-1-area-0.0.0.0]quit
[R2-ospf-1]area 0.0.0.1
[R2-ospf-1-area-0.0.0.1]network 10.0.0.4 0.0.0.3
[R2-ospf-1-area-0.0.0.1]nssa
[R2-ospf-1-area-0.0.0.1]quit
[R2-ospf-1]quit
```

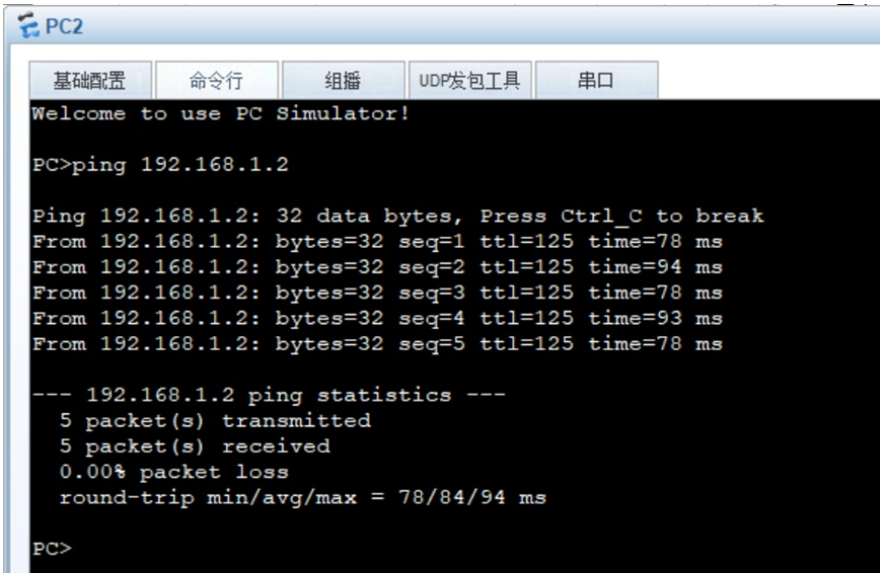
R3：

```
<Huawei>u t m
Info: Current terminal monitor is off.
<Huawei>u t d
Info: Current terminal debugging is off.
<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R3
[R3]int loopback 0
[R3-LoopBack0]ip address 3.3.3.3 32
[R3-LoopBack0]quit
[R3]int gi 0/0/2
[R3-GigabitEthernet0/0/2]ip address 192.168.2.1 24
[R3-GigabitEthernet0/0/2]quit
[R3]int gi 0/0/1
[R3-GigabitEthernet0/0/1]ip address 10.0.0.6 30
[R3-GigabitEthernet0/0/1]quit
[R3]ospf 1 router-id 3.3.3.3
[R3-ospf-1]area 0.0.0.1
[R3-ospf-1-area-0.0.0.1]network 10.0.0.4 0.0.0.3
[R3-ospf-1-area-0.0.0.1]network 3.3.3.3 0.0.0.0
[R3-ospf-1-area-0.0.0.1]network 192.168.2.0 0.0.0.255
[R3-ospf-1-area-0.0.0.1]nssa no-summary
[R3-ospf-1-area-0.0.0.1]quit
[R3-ospf-1]quit
```

配置PC的IP地址：

PC之间能相互PING通：





分别检查R1、R2、R3路由器都已经建立了OSPF邻居关系：

```
<R1>dis ospf peer

      OSPF Process 1 with Router ID 1.1.1.1
            Neighbors

 Area 0.0.0.0 interface 10.0.0.1(GigabitEthernet0/0/0)'s neighbors
 Router ID: 2.2.2.2          Address: 10.0.0.2
   State: Full  Mode:Nbr is  Master  Priority: 1
   DR: 10.0.0.1  BDR: 10.0.0.2  MTU: 0
   Dead timer due in 32  sec
   Retrans timer interval: 5
   Neighbor is up for 00:02:04
   Authentication Sequence: [ 0 ]
```

```
<R2>dis ospf peer

      OSPF Process 1 with Router ID 2.2.2.2
            Neighbors

 Area 0.0.0.0 interface 10.0.0.2(GigabitEthernet0/0/0)'s neighbors
 Router ID: 1.1.1.1          Address: 10.0.0.1
   State: Full  Mode:Nbr is  Slave  Priority: 1
   DR: 10.0.0.1  BDR: 10.0.0.2  MTU: 0
   Dead timer due in 32  sec
   Retrans timer interval: 5
   Neighbor is up for 00:02:30
   Authentication Sequence: [ 0 ]

            Neighbors

 Area 0.0.0.1 interface 10.0.0.5(GigabitEthernet0/0/1)'s neighbors
 Router ID: 3.3.3.3          Address: 10.0.0.6
   State: Full  Mode:Nbr is  Master  Priority: 1
   DR: 10.0.0.6  BDR: 10.0.0.5  MTU: 0
   Dead timer due in 29  sec
   Retrans timer interval: 5
   Neighbor is up for 00:02:25
   Authentication Sequence: [ 0 ]
```

```
<R3>dis ospf peer

      OSPF Process 1 with Router ID 3.3.3.3
            Neighbors

 Area 0.0.0.1 interface 10.0.0.6(GigabitEthernet0/0/1)'s neighbors
 Router ID: 2.2.2.2          Address: 10.0.0.5
   State: Full  Mode:Nbr is  Slave  Priority: 1
   DR: 10.0.0.6  BDR: 10.0.0.5  MTU: 0
   Dead timer due in 31  sec
   Retrans timer interval: 5
   Neighbor is up for 00:02:44
   Authentication Sequence: [ 0 ]
```

检查R1、R2、R3路由器的路由表，均已正常通过OSPF学习到对端的路由：

```
<R1>dis ospf routing

      OSPF Process 1 with Router ID 1.1.1.1
            Routing Tables

 Routing for Network
 Destination        Cost  Type       NextHop         AdvRouter       Area
 1.1.1.1/32         0     Stub       1.1.1.1         1.1.1.1         0.0.0.0
 10.0.0.0/30        1     Transit    10.0.0.1        1.1.1.1         0.0.0.0
 192.168.1.0/24     1     Stub       192.168.1.1     1.1.1.1         0.0.0.0
 2.2.2.2/32         1     Stub       10.0.0.2        2.2.2.2         0.0.0.0
 3.3.3.3/32         2     Inter-area 10.0.0.2        2.2.2.2         0.0.0.0
 10.0.0.4/30        2     Inter-area 10.0.0.2        2.2.2.2         0.0.0.0
 192.168.2.0/24     3     Inter-area 10.0.0.2        2.2.2.2         0.0.0.0

 Total Nets: 7
 Intra Area: 4  Inter Area: 3  ASE: 0  NSSA: 0
```

```
<R2>dis ospf routing

      OSPF Process 1 with Router ID 2.2.2.2
            Routing Tables

 Routing for Network
 Destination        Cost  Type       NextHop         AdvRouter       Area
 2.2.2.2/32         0     Stub       2.2.2.2         2.2.2.2         0.0.0.0
 10.0.0.0/30        1     Transit    10.0.0.2        2.2.2.2         0.0.0.0
 10.0.0.4/30        1     Transit    10.0.0.5        2.2.2.2         0.0.0.1
 1.1.1.1/32         1     Stub       10.0.0.1        1.1.1.1         0.0.0.0
 3.3.3.3/32         1     Stub       10.0.0.6        3.3.3.3         0.0.0.1
 192.168.1.0/24     2     Stub       10.0.0.1        1.1.1.1         0.0.0.0
 192.168.2.0/24     2     Stub       10.0.0.6        3.3.3.3         0.0.0.1

 Total Nets: 7
 Intra Area: 7  Inter Area: 0  ASE: 0  NSSA: 0
```

```
<R3>dis ospf routing

      OSPF Process 1 with Router ID 3.3.3.3
            Routing Tables

Routing for Network
Destination        Cost  Type       NextHop         AdvRouter       Area
3.3.3.3/32         0     Stub       3.3.3.3         3.3.3.3         0.0.0.1
10.0.0.4/30        1     Transit    10.0.0.6        3.3.3.3         0.0.0.1
192.168.2.0/24     1     Stub       192.168.2.1     3.3.3.3         0.0.0.1
1.1.1.1/32         2     Inter-area 10.0.0.5        2.2.2.2         0.0.0.1
2.2.2.2/32         1     Inter-area 10.0.0.5        2.2.2.2         0.0.0.1
10.0.0.0/30        2     Inter-area 10.0.0.5        2.2.2.2         0.0.0.1
192.168.1.0/24     3     Inter-area 10.0.0.5        2.2.2.2         0.0.0.1

Routing for NSSAs
Destination        Cost      Type       Tag         NextHop         AdvRouter
0.0.0.0/0          1         Type2      1           10.0.0.5        2.2.2.2

Total Nets: 8
Intra Area: 3  Inter Area: 4  ASE: 0  NSSA: 1
```

至此， OSPF NSSA区域典型组网配置案例已完成！