

HCIA 实验 4 OSPF

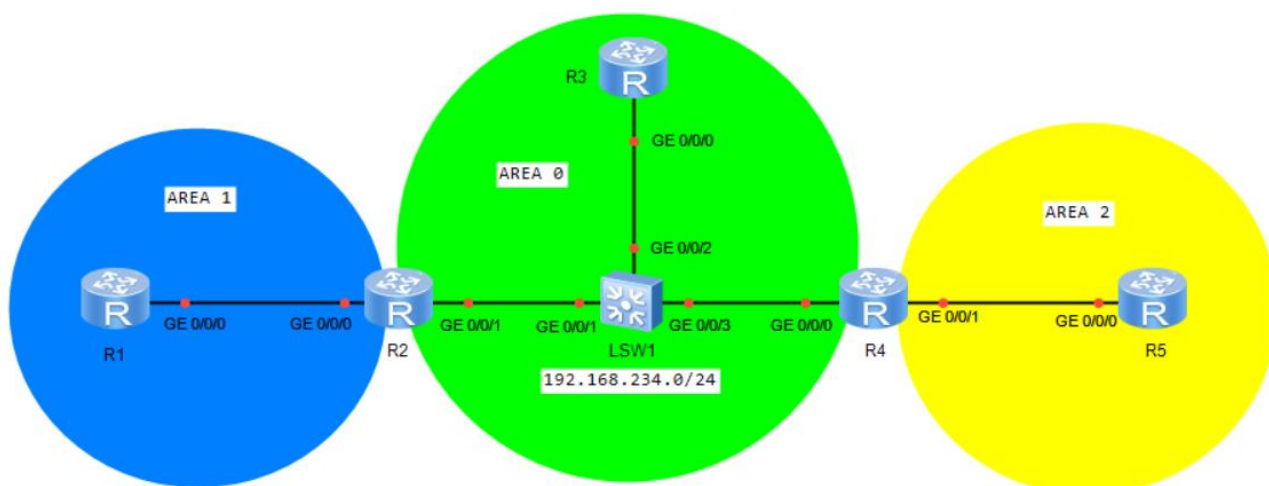
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修订记录				
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1 实验拓扑



2 实验需求

1. 如图所示，配置设备名称和IP地址

a) 设备Ra与设备Rb之间的互联地址按照192.168.ab.a/24和192.168.ab.b/24的方式规划 (a < B)

如R3与R4互联地址为192.168.34.3/24和192.168.34.4/24,以此类推。

b) 每台设备都有环回口Loopback0，设备Ra的地址为a.a.a.a/32

如R1就有Lo0 : 1.1.1.1/32

2. 在所有路由器上运行OSPF，满足以下需求：

- a) OSPF进程号为1，RID手动设置为Lo0地址。
- b) 如图所示划分OSPF区域，network命令使用接口配置掩码的反掩码。
- c) ABR的环回口宣告到区域0中。
- d) 在R2 R3 R4的邻居关系中，设置R3为DR，并且R2与R4保持2way状态。

3 配置思路及验证结果

3.1 配置设备名称和 IP 地址

R1

```
[Huawei] sysname R1
[R1] interface g0/0/0
[R1-GigabitEthernet0/0/0] ip address 192.168.12.1 24
[R1-GigabitEthernet0/0/0] interface LoopBack0
[R1-LoopBack0] ip address 1.1.1.1 32
```

R2

```
[Huawei] sysname R2
[R2] interface g0/0/0
[R2-GigabitEthernet0/0/0] ip address 192.168.12.2 24
[R2-GigabitEthernet0/0/0] interface g0/0/1
[R2-GigabitEthernet0/0/1] ip address 192.168.234.2 24
[R2-GigabitEthernet0/0/1] interface LoopBack0
[R2-LoopBack0] ip address 2.2.2.2 32
```

R3

```
[Huawei] sysname R3
[R3] interface g0/0/0
[R3-GigabitEthernet0/0/0] ip address 192.168.234.3 24
[R3-GigabitEthernet0/0/0] interface LoopBack0
[R3- interface LoopBack0] ip address 3.3.3.3 32
```

R4

```
[Huawei] sysname R4
[R4] interface g0/0/0
[R4-GigabitEthernet0/0/0] ip address 192.168.234.4 24
[R4-GigabitEthernet0/0/0] interface LoopBack0
[R4-LoopBack0] ip address 4.4.4.4 32
```

R5

```
[Huawei] sysname R5
[R5] interface g0/0/0
[R5-GigabitEthernet0/0/0] ip address 192.168.45.5 24
[R5-GigabitEthernet0/0/0] interface LoopBack0
[R5-LoopBack0] ip address 5.5.5.5 32
```

3.2 配置 OSPF Router-id , 并按照区域进行宣告

R1

```
[R1] ospf 1 router-id 1.1.1.1
[R1-ospf-1] area 1
[R1-ospf-1-area-0.0.0.1] network 192.168.12.0 0.0.0.255
[R1-ospf-1-area-0.0.0.1] network 1.1.1.1 0.0.0.0
```

R2

```
[R2] ospf 1 router-id 2.2.2.2
[R2-ospf-1] area 1
[R2-ospf-1-area-0.0.0.1] network 192.168.12.0 0.0.0.255
[R2-ospf-1] area 0
[R2-ospf-1-area-0.0.0.0] network 192.168.234.0 0.0.0.255
[R2-ospf-1-area-0.0.0.0] network 2.2.2.2 0.0.0.0
```

R3

```
[R3] ospf 1 router-id 3.3.3.3
[R3-ospf-1] area 0
[R3-ospf-1-area-0.0.0.0] network 192.168.234.0 0.0.0.255
[R3-ospf-1-area-0.0.0.0] network 3.3.3.3 0.0.0.0
```

R4

```
[R4] ospf 1 router-id 4.4.4.4
[R4-ospf-1] area 2
[R4-ospf-1-area-0.0.0.1] network 192.168.45.0 0.0.0.255
[R4-ospf-1] area 0
[R4-ospf-1-area-0.0.0.0] network 192.168.234.0 0.0.0.255
[R4-ospf-1-area-0.0.0.0] network 4.4.4.4 0.0.0.0
```

R5

```
[R5] ospf 1 router-id 5.5.5.5
[R5-ospf-1] area 2
```

```
[R5-ospf-1-area-0.0.0.2] network 192.168.45.0 0.0.0.255
```

```
[R5-ospf-1-area-0.0.0.2] network 3.3.3.3 0.0.0.0
```

3.3 配置 DR 优先级

R2

```
[R2] interface g0/0/1
```

```
[R2-GigabitEthernet0/0/1] ospf dr-priority 0
```

R4

```
[R4] interface g0/0/0
```

```
[R4-GigabitEthernet0/0/0] ospf dr-priority 0
```

3.4 实验结果验证

a) R1 上通过 ospf 可以学习到所有设备的环回口路由

```
<R1>display ip routing-table protocol ospf
Route Flags: R - relay, D - download to fib
-----
Public routing table : OSPF
      Destinations : 6          Routes : 6

OSPF routing table status : <Active>
      Destinations : 6          Routes : 6

Destination/Mask    Proto   Pre  Cost   Flags NextHop         Interface
-----
0/0/0               2.2.2.2/32 OSPF   10    1       D    192.168.12.2       GigabitEthernet
0/0/0               3.3.3.3/32 OSPF   10    2       D    192.168.12.2       GigabitEthernet
0/0/0               4.4.4.4/32 OSPF   10    2       D    192.168.12.2       GigabitEthernet
0/0/0               5.5.5.5/32 OSPF   10    3       D    192.168.12.2       GigabitEthernet
0/0/0               192.168.45.0/24 OSPF   10    3       D    192.168.12.2       GigabitEthernet
0/0/0               192.168.234.0/24 OSPF   10    2       D    192.168.12.2       GigabitEthernet
0/0/0

OSPF routing table status : <Inactive>
      Destinations : 0          Routes : 0
```

b) R2 与 R3 之间是 2-way 的邻居关系

```
<R2>dis ospf peer brief
```

```
OSPF Process 1 with Router ID 2.2.2.2  
Peer Statistic Information
```

Area Id	Interface	Neighbor id	State	
0.0.0.0	GigabitEthernet0/0/1	3.3.3.3	Full	DR
0.0.0.0	GigabitEthernet0/0/1	4.4.4.4	2-Way	BDR
0.0.0.1	GigabitEthernet0/0/0	1.1.1.1	Full	