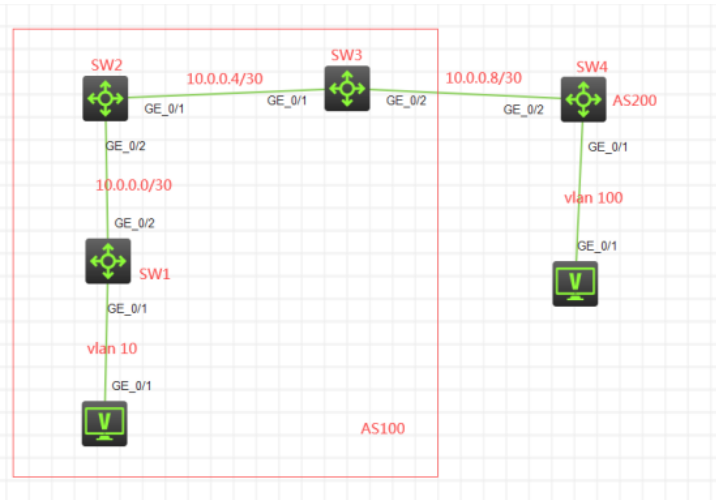


知 S5820 BGP RR二级路由反射器典型组网配置

[BGP](#)[OSPF](#)[H3C模拟器](#)[韦家宁](#)

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组网及说明



组网说明：

本案例采用H3C HCL模拟器的S5820交换机来模拟BGP RR二级路由反射器的典型组网配置。其中SW1、SW2、SW3属于AS100，SW4属于AS200，由于SW1、SW2与SW4没有互联，同时又想实现PC之间的互通，因此需要使用BGP RR二级路由反射器来实现。SW2是SW1的一级RR反射，SW3是SW2的二级反射。SW1与SW2，SW2与SW3建立IBGP邻居关系，为了SW1与SW2，SW2与SW3建立IBGP邻居关系及RR路由反射，因此SW1、SW2、SW3之间建立OSPF邻居关系来进行承载。最后SW3与SW4建立EBGP邻居关系。

IP地址规划：

设备名称	VLAN/接口	IP地址	子网掩码	备注
SW1	VLAN 10	192.168.10.1	24	
	GI 1/0/2	10.0.0.1	30	
	Loopback 0	1.1.1.1	32	Router-id
SW2	GI 1/0/2	10.0.0.2	30	
	GI 1/0/1	10.0.0.5	30	
	Loopback 0	2.2.2.2	32	Router-id
SW3	GI 1/0/1	10.0.0.6	30	
	GI 1/0/2	10.0.0.9	30	
	Loopback 0	3.3.3.3	32	Router-id
SW4	VLAN 100	172.16.10.1	24	
	GI 1/0/2	10.0.0.10	30	
	Loopback 0	4.4.4.4	32	Router-id

配置步骤

SW1：

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname SW1
[SW1]int loopback 0
[SW1-LoopBack0]ip address 1.1.1.1 32
[SW1-LoopBack0]quit
[SW1]router id 1.1.1.1
[SW1]vlan 10
[SW1-vlan10]quit
[SW1]int vlan 10
[SW1-Vlan-interface10]ip address 192.168.10.1 24
[SW1-Vlan-interface10]quit
[SW1]int gi 1/0/1
[SW1-GigabitEthernet1/0/1]port link-type access
[SW1-GigabitEthernet1/0/1]port access vlan 10
[SW1-GigabitEthernet1/0/1]quit
[SW1]int gi 1/0/2
[SW1-GigabitEthernet1/0/2]port link-mode route
[SW1-GigabitEthernet1/0/2]des <connect to SW2>
```

```
[SW1-GigabitEthernet1/0/2]ip address 10.0.0.1 30
[SW1-GigabitEthernet1/0/2]quit
[SW1]ospf 1 router-id 1.1.1.1
[SW1-ospf-1]area 0.0.0.0
[SW1-ospf-1-area-0.0.0.0]network 10.0.0.1 0.0.0.0
[SW1-ospf-1-area-0.0.0.0]network 1.1.1.1 0.0.0.0
[SW1-ospf-1-area-0.0.0.0]quit
[SW1-ospf-1]quit
[SW1]bgp 100
[SW1-bgp-default]router-id 1.1.1.1
[SW1-bgp-default]peer 2.2.2.2 as-number 100
[SW1-bgp-default]peer 2.2.2.2 connect-interface LoopBack 0
[SW1-bgp-default]address-family ipv4 unicast
[SW1-bgp-default-ipv4]peer 2.2.2.2 enable
[SW1-bgp-default-ipv4]network 192.168.10.0 255.255.255.0
[SW1-bgp-default-ipv4]quit
[SW1-bgp-default]quit
```

SW2:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname SW2
[SW2]int loopback 0
[SW2-LoopBack0]ip address 2.2.2.2 32
[SW2-LoopBack0]quit
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]port link-mode route
[SW2-GigabitEthernet1/0/2]des <connect to SW1>
[SW2-GigabitEthernet1/0/2]ip address 10.0.0.2 30
[SW2-GigabitEthernet1/0/2]quit
[SW2]int gi 1/0/1
[SW2-GigabitEthernet1/0/1]port link-mode route
[SW2-GigabitEthernet1/0/1]des <connect to SW3>
[SW2-GigabitEthernet1/0/1]ip address 10.0.0.5 30
[SW2-GigabitEthernet1/0/1]quit
[SW2]ospf 1 router-id 2.2.2.2
[SW2-ospf-1]area 0.0.0.0
[SW2-ospf-1-area-0.0.0.0]network 10.0.0.2 0.0.0.0
[SW2-ospf-1-area-0.0.0.0]network 10.0.0.5 0.0.0.0
[SW2-ospf-1-area-0.0.0.0]network 2.2.2.2 0.0.0.0
[SW2-ospf-1-area-0.0.0.0]quit
[SW2-ospf-1]quit
[SW2]bgp 100
[SW2-bgp-default]router-id 2.2.2.2
[SW2-bgp-default]peer 3.3.3.3 as-number 100
[SW2-bgp-default]peer 3.3.3.3 connect-interface LoopBack 0
[SW2-bgp-default]peer 1.1.1.1 as-number 100
[SW2-bgp-default]peer 1.1.1.1 connect-interface LoopBack 0
[SW2-bgp-default]address-family ipv4 unicast
[SW2-bgp-default-ipv4]peer 3.3.3.3 enable
[SW2-bgp-default-ipv4]peer 1.1.1.1 enable
[SW2-bgp-default-ipv4]peer 1.1.1.1 reflect-client //指定1.1.1.1为反射器的客户端
[SW2-bgp-default-ipv4]quit
[SW2-bgp-default]quit
```

SW3:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname SW3
[SW3]int loopback 0
[SW3-LoopBack0]ip address 3.3.3.3 32
[SW3-LoopBack0]quit
[SW3]router id 3.3.3.3
[SW3]int gi 1/0/1
```

```

[SW3-GigabitEthernet1/0/1]port link-mode route
[SW3-GigabitEthernet1/0/1]des <connect to SW2>
[SW3-GigabitEthernet1/0/1]ip address 10.0.0.6 30
[SW3-GigabitEthernet1/0/1]quit
[SW3]int gi 1/0/2
[SW3-GigabitEthernet1/0/2]port link-mode route
[SW3-GigabitEthernet1/0/2]des <connect to SW4>
[SW3-GigabitEthernet1/0/2]ip address 10.0.0.9 30
[SW3-GigabitEthernet1/0/2]quit
[SW3]ospf 1 router-id 3.3.3.3
[SW3-ospf-1]area 0.0.0.0
[SW3-ospf-1-area-0.0.0.0]network 10.0.0.6 0.0.0.0
[SW3-ospf-1-area-0.0.0.0]network 10.0.0.9 0.0.0.0
[SW3-ospf-1-area-0.0.0.0]network 3.3.3.3 0.0.0.0
[SW3-ospf-1-area-0.0.0.0]quit
[SW3-ospf-1]quit
[SW3]bgp 100
[SW3-bgp-default]router-id 3.3.3.3
[SW3-bgp-default]peer 2.2.2.2 as-number 100
[SW3-bgp-default]peer 2.2.2.2 connect-interface LoopBack 0
[SW3-bgp-default]peer 10.0.0.10 as-number 200
[SW3-bgp-default]address-family ipv4 unicast
[SW3-bgp-default-ipv4]peer 10.0.0.10 enable
[SW3-bgp-default-ipv4]peer 2.2.2.2 enable
[SW3-bgp-default-ipv4]peer 2.2.2.2 reflect-client //指定2.2.2.2为RR反射器的客户端
[SW3-bgp-default-ipv4]quit
[SW3-bgp-default]quit

```

SW4:

```

<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname SW4
[SW4]int loopback 0
[SW4-LoopBack0]ip address 4.4.4.4 32
[SW4-LoopBack0]quit
[SW4]router id 4.4.4.4
[SW4]vlan 100
[SW4-vlan100]quit
[SW4]int vlan 100
[SW4-Vlan-interface100]ip address 172.16.10.1 24
[SW4-Vlan-interface100]quit
[SW4]int gi 1/0/1
[SW4-GigabitEthernet1/0/1]port link-type access
[SW4-GigabitEthernet1/0/1]port access vlan 100
[SW4-GigabitEthernet1/0/1]quit
[SW4]int gi 1/0/2
[SW4-GigabitEthernet1/0/2]port link-mode route
[SW4-GigabitEthernet1/0/2]des <connect to SW3>
[SW4-GigabitEthernet1/0/2]ip address 10.0.0.10 30
[SW4-GigabitEthernet1/0/2]quit
[SW4]bgp 200
[SW4-bgp-default]router-id 4.4.4.4
[SW4-bgp-default]peer 10.0.0.9 as-number 100
[SW4-bgp-default]address-family ipv4 unicast
[SW4-bgp-default-ipv4]peer 10.0.0.9 enable
[SW4-bgp-default-ipv4]network 172.16.10.0 255.255.255.0
[SW4-bgp-default-ipv4]quit
[SW4-bgp-default]quit

```

测试:

所有PC都填写IP地址:

配置PC_5

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	192.168.10.2/24	

刷新

接口管理

☐ 禁用
 ☒ 启用

IPv4配置:

☐ DHCP
 ☒ 静态

IPv4地址:

掩码地址:

IPv4网关:

启用

配置PC_6

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	172.16.10.2/24	

刷新

接口管理

☐ 禁用
 ☒ 启用

IPv4配置:

☐ DHCP
 ☒ 静态

IPv4地址:

掩码地址:

IPv4网关:

启用

PC之间可以相互PING通:

```

hcl_uby0r1
S5820V2-54Q5-GE_4 S5820V2-54Q5-GE_3 S5820V2-54Q5-GE_2 S5820V2-54Q5-GE_1 PC_5 PC_6
<H3C>#Apr 7 13:40:10:334 2020 H3C SHELL/5/SHELL_LOGIN: Console logged in from con0.

<H3C>#ping 172.16.10.2
Ping 172.16.10.2 (172.16.10.2): 56 data bytes, press CTRL_C to break
56 bytes from 172.16.10.2: icmp_seq=0 ttl=251 time=17.000 ms
56 bytes from 172.16.10.2: icmp_seq=1 ttl=251 time=4.000 ms
56 bytes from 172.16.10.2: icmp_seq=2 ttl=251 time=8.000 ms
56 bytes from 172.16.10.2: icmp_seq=3 ttl=251 time=2.000 ms
56 bytes from 172.16.10.2: icmp_seq=4 ttl=251 time=3.000 ms

--- Ping statistics for 172.16.10.2 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 2.000/6.800/17.000/5.492 ms
<H3C>#Apr 7 13:40:22:744 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 172.16.10.2:
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-trip min/avg/max/
std-dev = 2.000/6.800/17.000/5.492 ms.
  
```

```

hcl_uby0r1
S5820V2-54Q5-GE_4 S5820V2-54Q5-GE_3 S5820V2-54Q5-GE_2 S5820V2-54Q5-GE_1 PC_5 PC_6
<H3C>#Apr 7 13:40:47:514 2020 H3C SHELL/5/SHELL_LOGIN: Console logged in from con0.

<H3C>#ping 192.168.10.1
Ping 192.168.10.1 (192.168.10.1): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.10.1: icmp_seq=0 ttl=252 time=4.000 ms
56 bytes from 192.168.10.1: icmp_seq=1 ttl=252 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=2 ttl=252 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=3 ttl=252 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=4 ttl=252 time=3.000 ms

--- Ping statistics for 192.168.10.1 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 2.000/2.600/4.000/0.800 ms
<H3C>#Apr 7 13:41:11:767 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 192.168.10.1:
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-trip min/avg/max/
std-dev = 2.000/2.600/4.000/0.800 ms.

<H3C>#
  
```

分别查看SW1、SW2、SW3的OSPF邻居信息:

```
<SW1>dis ospf peer

      OSPF Process 1 with Router ID 1.1.1.1
        Neighbor Brief Information

Area: 0.0.0.0
Router ID      Address          Pri Dead-Time  State          Interface
2.2.2.2        10.0.0.2          1   40            Full/BDR       GE1/0/2
<SW1>
```

```
<SW2>dis ospf peer

      OSPF Process 1 with Router ID 2.2.2.2
        Neighbor Brief Information

Area: 0.0.0.0
Router ID      Address          Pri Dead-Time  State          Interface
3.3.3.3        10.0.0.6          1   38            Full/BDR       GE1/0/1
1.1.1.1        10.0.0.1          1   33            Full/DR        GE1/0/2
<SW2>
```

```
[SW3]dis ospf peer

      OSPF Process 1 with Router ID 3.3.3.3
        Neighbor Brief Information

Area: 0.0.0.0
Router ID      Address          Pri Dead-Time  State          Interface
2.2.2.2        10.0.0.5          1   31            Full/DR        GE1/0/1
[SW3]
```

分别查看SW1、SW2、SW3、SW4的BGP邻居信息：

```
<SW1>dis bgp peer ipv4

BGP local router ID: 1.1.1.1
Local AS number: 100
Total number of peers: 1          Peers in established state: 1

* - Dynamically created peer
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
2.2.2.2    100    33       26       0      1 00:20:23 Established
<SW1>
```

```
<SW2>dis bgp peer ipv4

BGP local router ID: 2.2.2.2
Local AS number: 100
Total number of peers: 2          Peers in established state: 2

* - Dynamically created peer
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1    100    26       33       0      1 00:20:30 Established
3.3.3.3    100    22       21       0      1 00:14:20 Established
<SW2>
```

```
[SW3]dis bgp peer ipv4

BGP local router ID: 3.3.3.3
Local AS number: 100
Total number of peers: 2          Peers in established state: 2

* - Dynamically created peer
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
2.2.2.2    100    22       23       0      1 00:14:37 Established
10.0.0.10  200    14       20       0      1 00:10:29 Established
[SW3]
```

```
[SW4]dis bgp peer ipv4

BGP local router ID: 4.4.4.4
Local AS number: 200
Total number of peers: 1          Peers in established state: 1

* - Dynamically created peer
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
10.0.0.9   100    20       15       0      1 00:10:17 Established
[SW4]
```

分别查看SW1、SW2、SW3、SW4的路由表：

```
<SW1>dis ip routing-table
Destinations : 22      Routes : 22

Destination/Mask    Proto    Pre Cost       NextHop          Interface
0.0.0.0/32          Direct   0 0           127.0.0.1        InLoop0
1.1.1.1/32          Direct   0 0           127.0.0.1        InLoop0
2.2.2.2/32          O_INTRA 10 1           10.0.0.2         GE1/0/2
3.3.3.3/32          O_INTRA 10 2           10.0.0.2         GE1/0/2
10.0.0.0/30         Direct   0 0           10.0.0.1         GE1/0/2
10.0.0.0/32         Direct   0 0           10.0.0.1         GE1/0/2
10.0.0.1/32         Direct   0 0           127.0.0.1        InLoop0
10.0.0.3/32         Direct   0 0           10.0.0.1         GE1/0/2
10.0.0.4/30         O_INTRA 10 2           10.0.0.2         GE1/0/2
10.0.0.8/30         O_INTRA 10 3           10.0.0.2         GE1/0/2
127.0.0.0/8         Direct   0 0           127.0.0.1        InLoop0
127.0.0.0/32        Direct   0 0           127.0.0.1        InLoop0
127.0.0.1/32        Direct   0 0           127.0.0.1        InLoop0
127.255.255.255/32 Direct   0 0           127.0.0.1        InLoop0
172.16.10.0/24      BGP      255 0         10.0.0.10        GE1/0/2
192.168.10.0/24     Direct   0 0           192.168.10.1     Vlan10
192.168.10.0/32     Direct   0 0           192.168.10.1     Vlan10
192.168.10.1/32     Direct   0 0           127.0.0.1        InLoop0
192.168.10.255/32   Direct   0 0           192.168.10.1     Vlan10
224.0.0.0/4         Direct   0 0           0.0.0.0          NULL0
224.0.0.0/24        Direct   0 0           0.0.0.0          NULL0
255.255.255.255/32 Direct   0 0           127.0.0.1        InLoop0
<SW1>
```

```
<SW2>dis ip routing-table
Destinations : 22      Routes : 22

Destination/Mask    Proto    Pre Cost       NextHop          Interface
0.0.0.0/32          Direct   0 0           127.0.0.1        InLoop0
1.1.1.1/32          O_INTRA 10 1           10.0.0.1         GE1/0/2
2.2.2.2/32          Direct   0 0           127.0.0.1        InLoop0
3.3.3.3/32          O_INTRA 10 1           10.0.0.6         GE1/0/1
10.0.0.0/30         Direct   0 0           10.0.0.2         GE1/0/2
10.0.0.0/32         Direct   0 0           10.0.0.2         GE1/0/2
10.0.0.2/32         Direct   0 0           127.0.0.1        InLoop0
10.0.0.3/32         Direct   0 0           10.0.0.2         GE1/0/2
10.0.0.4/30         Direct   0 0           10.0.0.5         GE1/0/1
10.0.0.4/32         Direct   0 0           10.0.0.5         GE1/0/1
10.0.0.5/32         Direct   0 0           127.0.0.1        InLoop0
10.0.0.7/32         Direct   0 0           10.0.0.5         GE1/0/1
10.0.0.8/30         O_INTRA 10 2           10.0.0.6         GE1/0/1
127.0.0.0/8         Direct   0 0           127.0.0.1        InLoop0
127.0.0.0/32        Direct   0 0           127.0.0.1        InLoop0
127.0.0.1/32        Direct   0 0           127.0.0.1        InLoop0
127.255.255.255/32 Direct   0 0           127.0.0.1        InLoop0
172.16.10.0/24      BGP      255 0         10.0.0.10        GE1/0/1
192.168.10.0/24     BGP      255 0         1.1.1.1          GE1/0/2
224.0.0.0/4         Direct   0 0           0.0.0.0          NULL0
224.0.0.0/24        Direct   0 0           0.0.0.0          NULL0
255.255.255.255/32 Direct   0 0           127.0.0.1        InLoop0
<SW2>
```

```
[SW3]dis ip routing-table
Destinations : 22      Routes : 22

Destination/Mask    Proto    Pre Cost       NextHop          Interface
0.0.0.0/32          Direct   0 0           127.0.0.1        InLoop0
1.1.1.1/32          O_INTRA 10 2           10.0.0.5         GE1/0/1
2.2.2.2/32          O_INTRA 10 1           10.0.0.5         GE1/0/1
3.3.3.3/32          Direct   0 0           127.0.0.1        InLoop0
10.0.0.0/30         O_INTRA 10 2           10.0.0.5         GE1/0/1
10.0.0.4/30         Direct   0 0           10.0.0.6         GE1/0/1
10.0.0.4/32         Direct   0 0           10.0.0.6         GE1/0/1
10.0.0.6/32         Direct   0 0           127.0.0.1        InLoop0
10.0.0.7/32         Direct   0 0           10.0.0.6         GE1/0/1
10.0.0.8/30         Direct   0 0           10.0.0.9         GE1/0/2
10.0.0.8/32         Direct   0 0           10.0.0.9         GE1/0/2
10.0.0.9/32         Direct   0 0           127.0.0.1        InLoop0
10.0.0.11/32        Direct   0 0           10.0.0.9         GE1/0/2
127.0.0.0/8         Direct   0 0           127.0.0.1        InLoop0
127.0.0.0/32        Direct   0 0           127.0.0.1        InLoop0
127.0.0.1/32        Direct   0 0           127.0.0.1        InLoop0
127.255.255.255/32 Direct   0 0           127.0.0.1        InLoop0
172.16.10.0/24      BGP      255 0         10.0.0.10        GE1/0/2
192.168.10.0/24     BGP      255 0         1.1.1.1          GE1/0/1
224.0.0.0/4         Direct   0 0           0.0.0.0          NULL0
224.0.0.0/24        Direct   0 0           0.0.0.0          NULL0
255.255.255.255/32 Direct   0 0           127.0.0.1        InLoop0
[SW3]
```

```
[SW4]dis ip routing-table
```

Destinations : 18		Routes : 18			
Destination/Mask	Proto	Pre	Cost	NextHop	Interface
0.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
4.4.4.4/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.8/30	Direct	0	0	10.0.0.10	GE1/0/2
10.0.0.8/32	Direct	0	0	10.0.0.10	GE1/0/2
10.0.0.10/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.11/32	Direct	0	0	10.0.0.10	GE1/0/2
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
127.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0
172.16.10.0/24	Direct	0	0	172.16.10.1	Vlan100
172.16.10.0/32	Direct	0	0	172.16.10.1	Vlan100
172.16.10.1/32	Direct	0	0	127.0.0.1	InLoop0
172.16.10.255/32	Direct	0	0	172.16.10.1	Vlan100
192.168.10.0/24	BGP	255	0	10.0.0.9	GE1/0/2
224.0.0.0/4	Direct	0	0	0.0.0.0	NULL0
224.0.0.0/24	Direct	0	0	0.0.0.0	NULL0
255.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0

```
[SW4]
```

至此，S5820 BGP RR二级路由反射器典型组网配置已完成！

配置关键点