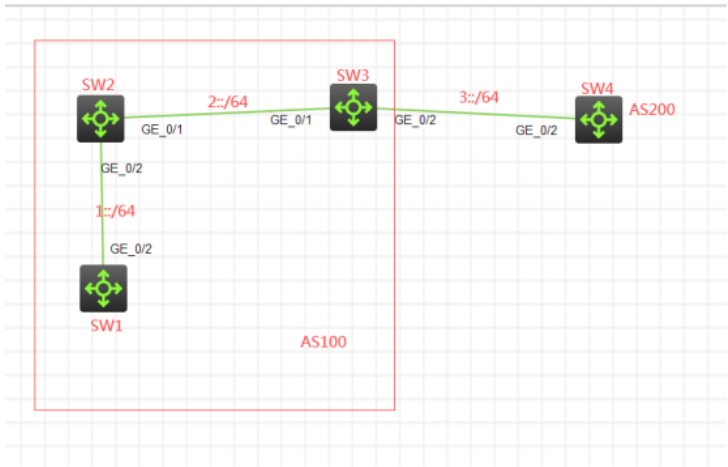


知 S5820 IPV6 BGP4+ RR二级路由反射器典型组网配置案例

IPv6 BGP OSPF H3C模拟器 韦家宁 2020-04-11 发表

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ipv6 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，同时又想实现业务地址之间的互通，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OSPFv3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/地址前缀	备注
SW1	Loopback 10	8::1	64	模拟业务
	Gi 1/0/2	1::1	64	
	Loopback 0	1.1.1.1	64	Router-id
	Loopback 1	4::1	64	Ipv6 Router-id
SW2	Gi 1/0/2	1::2	64	
	Gi 1/0/1	2::1	64	
	Loopback 0	2.2.2.2	64	Router-id
	Loopback 1	5::1	64	Ipv6 Router-id
SW3	Gi 1/0/1	2::2	64	
	Gi 1/0/2	3::1	64	
	Loopback 0	3.3.3.3	64	Router-id
	Loopback 1	6::1	64	Ipv6 Router-id
SW4	Loopback 100	9::1	64	模拟业务
	Gi 1/0/2	3::2	64	
	Loopback 0	4.4.4.4	64	Router-id
	Loopback 1	7::1	64	Ipv6 Router-id

配置步骤

SW1：

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]int loopback 1

[SW1-LoopBack1]ipv6 address 4::1 64

[SW1-LoopBack1]quit

[SW1]int loopback 10

[SW1-LoopBack10]ipv6 address 8::1 64

[SW1-LoopBack10]quit

[SW1]int gi 1/0/2

[SW1-GigabitEthernet1/0/2]port link-mode route

[SW1-GigabitEthernet1/0/2]des

```
[SW1-GigabitEthernet1/0/2]ipv6 address 1::1 64
[SW1-GigabitEthernet1/0/2]quit
[SW1]ospfv3 1
[SW1-ospfv3-1]router-id 1.1.1.1
[SW1-ospfv3-1]quit
[SW1]int gi 1/0/2
[SW1-GigabitEthernet1/0/2]ospfv3 1 area 0
[SW1-GigabitEthernet1/0/2]quit
[SW1]int loopback 1
[SW1-LoopBack1]ospfv3 1 area 0
[SW1-LoopBack1]quit
[SW1]bgp 100
[SW1-bgp-default]router-id 1.1.1.1
[SW1-bgp-default]peer 5::1 as-number 100
[SW1-bgp-default]peer 5::1 connect-interface LoopBack 1
[SW1-bgp-default]address-family ipv6 unicast
[SW1-bgp-default-ipv6]peer 5::1 enable
[SW1-bgp-default-ipv6]network 8:: 64
[SW1-bgp-default-ipv6]quit
[SW1-bgp-default]quit
```

SW2:

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 loopback 1
[SW2-LoopBack1]ipv6 address 5::1 64
[SW2-LoopBack1]quit
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]port link-mode route
[SW2-GigabitEthernet1/0/2]des
[SW2-GigabitEthernet1/0/2]ipv6 address 1::2 64
[SW2-GigabitEthernet1/0/2]quit
[SW2]int gi 1/0/1
[SW2-GigabitEthernet1/0/1]port link-mode route
[SW2-GigabitEthernet1/0/1]des
[SW2-GigabitEthernet1/0/1]ipv6 address 2::1 64
[SW2-GigabitEthernet1/0/1]quit
[SW2]ospfv3 1
[SW2-ospfv3-1]router-id 2.2.2.2
[SW2-ospfv3-1]quit
[SW2]int loopback 1
[SW2-LoopBack1]ospfv3 1 area 0
[SW2-LoopBack1]quit
[SW2]int gi 1/0/1
[SW2-GigabitEthernet1/0/1]ospfv3 1 area 0
[SW2-GigabitEthernet1/0/1]quit
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]ospfv3 1 area 0
[SW2-GigabitEthernet1/0/2]quit
[SW2]bgp 100
[SW2-bgp-default]router-id 2.2.2.2
[SW2-bgp-default]peer 6::1 as-number 100
[SW2-bgp-default]peer 4::1 as-number 100
[SW2-bgp-default]peer 6::1 connect-interface LoopBack 1
[SW2-bgp-default]peer 4::1 connect-interface LoopBack 1
[SW2-bgp-default]address-family ipv6 unicast
[SW2-bgp-default-ipv6]peer 6::1 enable
[SW2-bgp-default-ipv6]peer 4::1 enable
[SW2-bgp-default-ipv6]peer 4::1 reflect-client //指向4::1为RR反射器的客户端
[SW2-bgp-default-ipv6]quit
```

```
[SW2-bgp-default]quit
```

SW3:

```
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]int loopback 1
```

```
[SW3-LoopBack1]ipv6 address 6::1 64
```

```
[SW3-LoopBack1]quit
```

```
[SW3]int gi 1/0/1
```

```
[SW3-GigabitEthernet1/0/1]port link-mode route
```

```
[SW3-GigabitEthernet1/0/1]des
```

```
[SW3-GigabitEthernet1/0/1]ipv6 address 2::2 64
```

```
[SW3-GigabitEthernet1/0/1]quit
```

```
[SW3]int gi 1/0/2
```

```
[SW3-GigabitEthernet1/0/2]port link-mode route
```

```
[SW3-GigabitEthernet1/0/2]des
```

```
[SW3-GigabitEthernet1/0/2]ipv6 address 3::1 64
```

```
[SW3-GigabitEthernet1/0/2]quit
```

```
[SW3]ospfv3 1
```

```
[SW3-ospfv3-1]router-id 3.3.3.3
```

```
[SW3-ospfv3-1]quit
```

```
[SW3]int loopback 1
```

```
[SW3-LoopBack1]ospfv3 1 area 0
```

```
[SW3-LoopBack1]quit
```

```
[SW3]int gi 1/0/2
```

```
[SW3-GigabitEthernet1/0/2]ospfv3 1 area 0
```

```
[SW3-GigabitEthernet1/0/2]quit
```

```
[SW3]int gi 1/0/1
```

```
[SW3-GigabitEthernet1/0/1]ospfv3 1 area 0
```

```
[SW3-GigabitEthernet1/0/1]quit
```

```
[SW3]bgp 100
```

```
[SW3-bgp-default]router-id 3.3.3.3
```

```
[SW3-bgp-default]peer 5::1 as-number 100
```

```
[SW3-bgp-default]peer 5::1 connect-interface LoopBack 1
```

```
[SW3-bgp-default]peer 3::2 as-number 200
```

```
[SW3-bgp-default]address-family ipv6 unicast
```

```
[SW3-bgp-default-ipv6]peer 3::2 enable
```

```
[SW3-bgp-default-ipv6]peer 5::1 enable
```

```
[SW3-bgp-default-ipv6]peer 5::1 reflect-client //指向5::1为RR路由反射器的客户端
```

```
[SW3-bgp-default-ipv6]quit
```

```
[SW3-bgp-default]quit
```

SW4:

```
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]int loopback 1
```

```
[SW4-LoopBack1]ipv6 address 7::1 64
```

```
[SW4-LoopBack1]quit
```

```
[SW4]int loopback 100
```

```
[SW4-LoopBack100]ipv6 address 9::1 64
```

```
[SW4-LoopBack100]quit
```

```
[SW4]int gi 1/0/2
```

```
[SW4-GigabitEthernet1/0/2]port link-mode route
```

```
[SW4-GigabitEthernet1/0/2]des
```

```
[SW4-GigabitEthernet1/0/2]ipv6 address 3::2 64
```

```
[SW4-GigabitEthernet1/0/2]quit
[SW4]bgp 200
[SW4-bgp-default]router-id 4.4.4.4
[SW4-bgp-default]peer 3::1 as-number 100
[SW4-bgp-default]address-family ipv6 unicast
[SW4-bgp-default-ipv6]peer 3::1 enable
[SW4-bgp-default-ipv6]network 9:: 64
[SW4-bgp-default-ipv6]quit
[SW4-bgp-default]quit
```

测试:

SW1的loopback 10能与SW4的loopback 100互通:

```
[SW1]ping ipv6 -a 8::1 9::1
Ping6(56 data bytes) 8::1 --> 9::1, press CTRL_C to break
56 bytes from 9::1, icmp_seq=0 hlim=62 time=3.000 ms
56 bytes from 9::1, icmp_seq=1 hlim=62 time=1.000 ms
56 bytes from 9::1, icmp_seq=2 hlim=62 time=1.000 ms
56 bytes from 9::1, icmp_seq=3 hlim=62 time=1.000 ms
56 bytes from 9::1, icmp_seq=4 hlim=62 time=1.000 ms

--- Ping6 statistics for 9::1 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.000/1.400/3.000/0.800 ms
[SW1]Apr  7 14:35:07:555 2020 SW1 PING/6/PING_STATISTICS: Ping6 st
cket(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-
v = 1.000/1.400/3.000/0.800 ms.
```

```
[SW4]ping ipv6 -a 9::1 8::1
Ping6(56 data bytes) 9::1 --> 8::1, press CTRL_C to break
56 bytes from 8::1, icmp_seq=0 hlim=62 time=2.000 ms
56 bytes from 8::1, icmp_seq=1 hlim=62 time=2.000 ms
56 bytes from 8::1, icmp_seq=2 hlim=62 time=2.000 ms
56 bytes from 8::1, icmp_seq=3 hlim=62 time=2.000 ms
56 bytes from 8::1, icmp_seq=4 hlim=62 time=2.000 ms

--- Ping6 statistics for 8::1 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 2.000/2.000/2.000/0.000 ms
[SW4]Apr  7 14:37:13:464 2020 SW4 PING/6/PING_STATISTICS: Ping6 s
cket(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-
v = 2.000/2.000/2.000/0.000 ms.
```

分别查看SW1、SW2、SW3的OSPFV3邻居信息:

```
[SW1]dis ospfv3 peer

          OSPFv3 Process 1 with Router ID 1.1.1.1

Area: 0.0.0.0
-----
Router ID    Pri State          Dead-Time InstID Interface
2.2.2.2      1  Full/BDR          00:00:33  0    GE1/0/2
[SW1]
```

```
[SW2]dis ospfv3 peer

          OSPFv3 Process 1 with Router ID 2.2.2.2

Area: 0.0.0.0
-----
Router ID    Pri State          Dead-Time InstID Interface
3.3.3.3      1  Full/BDR          00:00:37  0    GE1/0/1
1.1.1.1      1  Full/DR           00:00:37  0    GE1/0/2
[SW2]
```

```
[SW3]dis ospfv3 peer

          OSPFv3 Process 1 with Router ID 3.3.3.3

Area: 0.0.0.0
-----
Router ID    Pri State          Dead-Time InstID Interface
2.2.2.2      1  Full/DR           00:00:30  0    GE1/0/1
[SW3]
```

分别查看SW1、SW2、SW3、SW4的BGP4+邻居信息:

```
[SW1]dis bgp peer ipv6

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
5::1      100    12       11     0    1 00:07:06 Established
[SW1]
```

```
[SW2]dis bgp peer ipv6

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
4::1      100    11       12     0    1 00:07:24 Established
6::1      100    13       15     0    1 00:07:25 Established
[SW2]
```

```
[SW3]dis bgp peer ipv6

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
3::2      200     9        9     0    1 00:05:19 Established
5::1      100    13       13     0    1 00:07:33 Established
[SW3]
```

```
[SW4]dis bgp peer ipv6

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
3::1      100     9       10     0    1 00:05:42 Established
[SW4]
```

分别查看SW1、SW2、SW3、SW4的IPv6路由表:

[SW1]dis ipv6 routing-table

Destinations : 14 Routes : 14

Destination: ::1/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 1::/64 Protocol : Direct
NextHop : :: Preference: 0
Interface : GE1/0/2 Cost : 0

Destination: 1::1/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 2::/64 Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:307 Preference: 10
Interface : GE1/0/2 Cost : 2

Destination: 3::/64 Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:307 Preference: 10
Interface : GE1/0/2 Cost : 3

Destination: 4::/64 Protocol : Direct
NextHop : :: Preference: 0
Interface : Loop1 Cost : 0

Destination: 4::1/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 5::1/128 Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:307 Preference: 10
Interface : GE1/0/2 Cost : 1

Destination: 6::1/128 Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:307 Preference: 10
Interface : GE1/0/2 Cost : 2

Destination: 8::/64 Protocol : Direct
NextHop : :: Preference: 0
Interface : Loop10 Cost : 0

Destination: 8::1/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 9::/64 Protocol : BGP4+
NextHop : 3::2 Preference: 255
Interface : GE1/0/2 Cost : 0

Destination: FE80::/10 Protocol : Direct
NextHop : :: Preference: 0
Interface : InLoop0 Cost : 0

Destination: FF00::/8 Protocol : Direct
NextHop : :: Preference: 0
Interface : NULL0 Cost : 0
[SW1]

[SW2]dis ipv6 routing-table

Destinations : 14 Routes : 14

Destination: ::1/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 1::/64 Protocol : Direct
NextHop : :: Preference: 0
Interface : GE1/0/2 Cost : 0

Destination: 1::2/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 2::/64 Protocol : Direct
NextHop : :: Preference: 0
Interface : GE1/0/1 Cost : 0

Destination: 2::1/128 Protocol : Direct
NextHop : ::1 Preference: 0
Interface : InLoop0 Cost : 0

Destination: 3::/64 Protocol : O_INTRA
NextHop : FE80::2ADE:87FF:FE8D:206 Preference: 10
Interface : GE1/0/1 Cost : 2

Destination: 4::1/128 Protocol : O_INTRA
NextHop : FE80::2ADE:92FF:FED6:407 Preference: 10
Interface : GE1/0/2 Cost : 1

Destination: 5::/64 Protocol : Direct
NextHop : :: Preference: 0

Interface : Loop1	Cost : 0
Destination: 5::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 6::1/128	Protocol : O_INTRA
NextHop : FE80::2ADE:87FF:FE8D:206	Preference: 10
Interface : GE1/0/1	Cost : 1
Destination: 8::/64	Protocol : BGP4+
NextHop : 4::1	Preference: 255
Interface : GE1/0/2	Cost : 0
Destination: 9::/64	Protocol : BGP4+
NextHop : 3::2	Preference: 255
Interface : GE1/0/1	Cost : 0
Destination: FE80::/10	Protocol : Direct
NextHop : ::	Preference: 0
Interface : InLoop0	Cost : 0
Destination: FF00::/8	Protocol : Direct
NextHop : ::	Preference: 0
Interface : NULL0	Cost : 0

[SW2]

[SW3]dis ipv6 routing-table

Destinations : 14 Routes : 14

Destination: ::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 1::/64	Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:306	Preference: 10
Interface : GE1/0/1	Cost : 2
Destination: 2::/64	Protocol : Direct
NextHop : ::	Preference: 0
Interface : GE1/0/1	Cost : 0
Destination: 2::2/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 3::/64	Protocol : Direct
NextHop : ::	Preference: 0
Interface : GE1/0/2	Cost : 0
Destination: 3::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 4::1/128	Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:306	Preference: 10
Interface : GE1/0/1	Cost : 2
Destination: 5::1/128	Protocol : O_INTRA
NextHop : FE80::2ADE:8EFF:FE3C:306	Preference: 10
Interface : GE1/0/1	Cost : 1
Destination: 6::/64	Protocol : Direct

NextHop : ::	Preference: 0
Interface : Loop1	Cost : 0
Destination: 6::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 8::/64	Protocol : BGP4+
NextHop : 4::1	Preference: 255
Interface : GE1/0/1	Cost : 0
Destination: 9::/64	Protocol : BGP4+
NextHop : 3::2	Preference: 255
Interface : GE1/0/2	Cost : 0
Destination: FE80::/10	Protocol : Direct
NextHop : ::	Preference: 0
Interface : InLoop0	Cost : 0
Destination: FF00::/8	Protocol : Direct
NextHop : ::	Preference: 0
Interface : NULL0	Cost : 0

[SW3]

[SW4]dis ipv6 routing-table

Destinations : 10 Routes : 10

Destination: ::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 3::/64	Protocol : Direct
NextHop : ::	Preference: 0
Interface : GE1/0/2	Cost : 0
Destination: 3::2/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 7::/64	Protocol : Direct
NextHop : ::	Preference: 0
Interface : Loop1	Cost : 0
Destination: 7::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: 8::/64	Protocol : BGP4+
NextHop : 3::1	Preference: 255
Interface : GE1/0/2	Cost : 0
Destination: 9::/64	Protocol : Direct
NextHop : ::	Preference: 0
Interface : Loop100	Cost : 0
Destination: 9::1/128	Protocol : Direct
NextHop : ::1	Preference: 0
Interface : InLoop0	Cost : 0
Destination: FE80::/10	Protocol : Direct
NextHop : ::	Preference: 0
Interface : InLoop0	Cost : 0

Destination: FF00::/8	Protocol : Direct
NextHop : ::	Preference: 0
Interface : NULL0	Cost : 0
[SW4]	

至此，S5820 IPV6 BGP4+ RR二级路由反射器典型组网配置案例已完成！

配置关键点