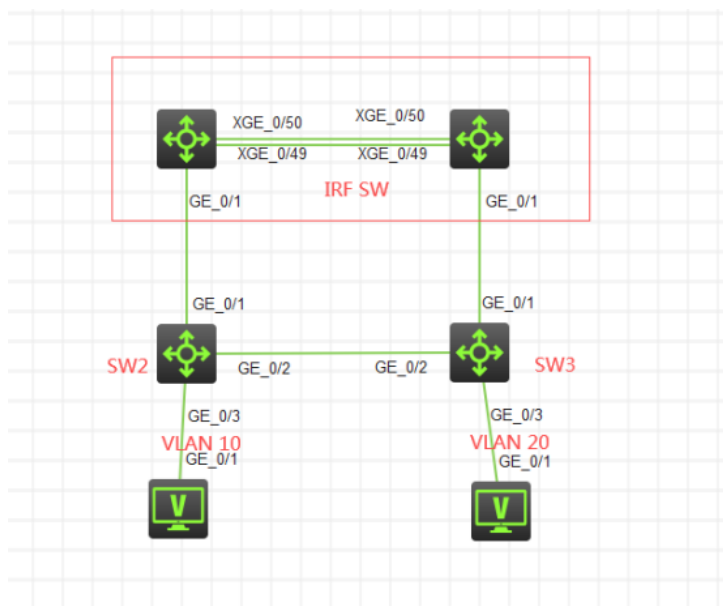# S5820 RSTP配置案例2（IRF组网模式下的接入设备采用STP priority）及切换演练

STP 韦家宁 2020-10-25 发表

本案例采用H3C HCL模拟器来模拟RSTP的部署，在网络拓扑图中已经明确标识了具体的设备和VLAN划分，其中SW部署IRF模式，SW2和SW3为接入交换机，为了实现链路冗余，将SW2和SW3连接起来，接着使用STP priority来指定端口的优先级来实现链路的"主备"，在该网络拓扑中，SW2和SW3互联的端口都配置STP priority为32，这样不仅能避免物理环路，还能实现链路冗余。

配置步骤

1、部署SW的IRF：

1号设备IRF部署：

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]irf member 1 renumber 1
Renumbering the member ID may result in configuration change or loss. Continue?[Y/N]:y
[H3C]int range ten 1/0/49 to ten 1/0/50
[H3C-if-range]shutdown
[H3C-if-range]quit
[H3C]irf-port 1/1
[H3C-irf-port1/1]port group interface Ten-GigabitEthernet 1/0/49
[H3C-irf-port1/1]port group interface Ten-GigabitEthernet 1/0/50
[H3C-irf-port1/1]quit
[H3C]int range ten 1/0/49 to ten 1/0/50
[H3C-if-range]undo shutdown
[H3C-if-range]quit
[H3C]irf-port-configuration active
[H3C]%Oct 24 10:07:34:375 2020 H3C STM/6/STM_LINK_UP: IRF port 1 came up.

[H3C]save
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[flash:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
Validating file. Please wait...
Saved the current configuration to mainboard device successfully.
```

2号设备IRF部署：

```
[H3C]irf member 1 renumber 2
Renumbering the member ID may result in configuration change or loss. Continue?[Y/N]:y
[H3C]int range ten 1/0/49 to ten 1/0/50
```

[H3C-if-range]shutdown

[H3C-if-range]quit

[H3C]irf-port 1/2

[H3C-irf-port1/2]port group interface Ten-GigabitEthernet 1/0/49

[H3C-irf-port1/2]port group interface Ten-GigabitEthernet 1/0/50

[H3C-irf-port1/2]quit

[H3C]int range ten 1/0/49 to ten 1/0/50

[H3C-if-range]undo shutdown

[H3C-if-range]quit

[H3C]save

The current configuration will be written to the device. Are you sure? [Y/N]:y

Please input the file name(*.cfg)[flash:/startup.cfg]

(To leave the existing filename unchanged, press the enter key):

Validating file. Please wait...

Saved the current configuration to mainboard device successfully.

[H3C]irf-port-configuration active

[H3C]%Oct 24 10:10:59:609 2020 H3C STM/6/STM_LINK_UP: IRF port 2 came up.

[H3C]save

The current configuration will be written to the device. Are you sure? [Y/N]:y

Please input the file name(*.cfg)[flash:/startup.cfg]

(To leave the existing filename unchanged, press the enter key):

flash:/startup.cfg exists, overwrite? [Y/N]:y

Validating file. Please wait...

Saved the current configuration to mainboard device successfully.

重启部署了IRF的两台设备。

IRF部署已完成：

```
<H3C>dis irf
MemberID    Role    Priority  CPU-Mac         Description
 *+1        Master  1         8852-017f-0104  ---
  2         Standby 1         8852-0895-0204  ---
--------------------------------------------------
 * indicates the device is the master.
 + indicates the device through which the user logs in.

 The bridge MAC of the IRF is: 8852-017f-0100
 Auto upgrade              : yes
 Mac persistent            : 6 min
 Domain ID                 : 0
<H3C>%Oct 24 10:13:06:226 2020 H3C SHELL/5/SHELL_LOGIN: Console logged in f
```

```
<H3C>dis irf
MemberID    Role    Priority  CPU-Mac         Description
 *1         Master  1         8852-017f-0104  ---
 +2         Standby 1         8852-0895-0204  ---
--------------------------------------------------
 * indicates the device is the master.
 + indicates the device through which the user logs in.

 The bridge MAC of the IRF is: 8852-017f-0100
 Auto upgrade              : yes
 Mac persistent            : 6 min
 Domain ID                 : 0
<H3C>
```

1、配置SW的VLAN及RSTP

<H3C>sys

System View: return to User View with Ctrl+Z.

[H3C]sysname SW

[SW]vlan 10

[SW-vlan10]quit

[SW]vlan 20

[SW-vlan20]quit

[SW]int range gi 1/0/1 gi 2/0/1

[SW-if-range]port link-type trunk

[SW-if-range]undo port trunk permit vlan 1

[SW-if-range]port trunk permit vlan 10 20

[SW-if-range]quit

[SW-if-range]quit

[SW]int vlan 10

[SW-Vlan-interface10]ip address 192.168.10.1 24

[SW-Vlan-interface10]quit

[SW]int vlan 20

[SW-Vlan-interface20]ip address 192.168.20.1 24

[SW-Vlan-interface20]quit

[SW]stp global enable

[SW]stp mode rstp

[SW]stp priority 0

SW2配置：

<H3C>sys

System View: return to User View with Ctrl+Z.

[H3C]sysname SW2

[SW2]vlan 10

[SW2-vlan10]quit

[SW2]vlan 20

[SW2-vlan20]quit

[SW2]int range gi 1/0/1 to gi 1/0/2

[SW2-if-range]port link-type trunk

[SW2-if-range]undo port trunk permit vlan 1

[SW2-if-range]port trunk permit vlan 10 20

[SW2-if-range]quit

[SW2]int gi 1/0/3

[SW2-GigabitEthernet1/0/3]port link-type access

[SW2-GigabitEthernet1/0/3]port access vlan 10

[SW2-GigabitEthernet1/0/3]stp edged-port

Edge port should only be connected to terminal. It will cause temporary loops if port

GigabitEthernet1/0/3 is connected to bridges. Please use it carefully.

[SW2-GigabitEthernet1/0/3]quit

[SW2]stp global enable

[SW2]stp mode rstp

[SW2]int gi 1/0/2

[SW2-GigabitEthernet1/0/2]stp port priority 32

[SW2-GigabitEthernet1/0/2]quit
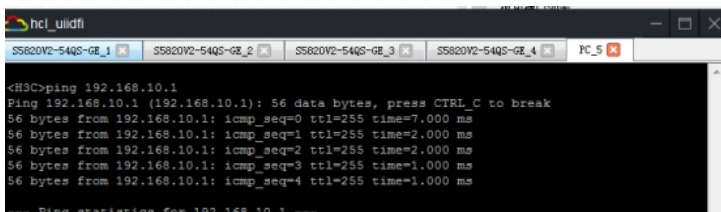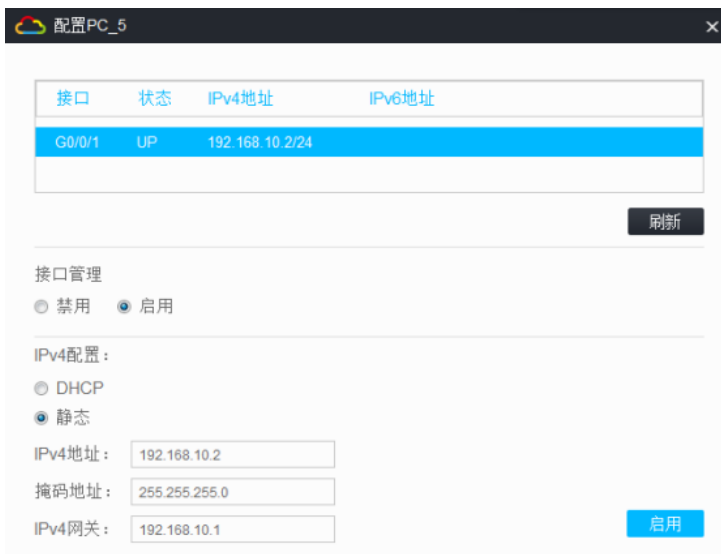

SW3配置：

<H3C>sys

System View: return to User View with Ctrl+Z.

[H3C]sysname SW3

[SW3]vlan 10

[SW3-vlan10]quit

[SW3]vlan 20

[SW3-vlan20]quit

[SW3]int range gi 1/0/1 to gi 1/0/2

[SW3-if-range]port link-type trunk

[SW3-if-range]undo port trunk permit vlan 1

[SW3-if-range]port trunk permit vlan 10 20

[SW3-if-range]quit

[SW3]int gi 1/0/3

[SW3-GigabitEthernet1/0/3]port link-type access

[SW3-GigabitEthernet1/0/3]port access vlan 20

[SW3-GigabitEthernet1/0/3]stp edged-port

Edge port should only be connected to terminal. It will cause temporary loops if port

GigabitEthernet1/0/3 is connected to bridges. Please use it carefully.

[SW3-GigabitEthernet1/0/3]quit

[SW3]stp global enable

[SW3]stp mode rstp

[SW3]int gi 1/0/2
[SW3-GigabitEthernet1/0/2]stp port priority 32
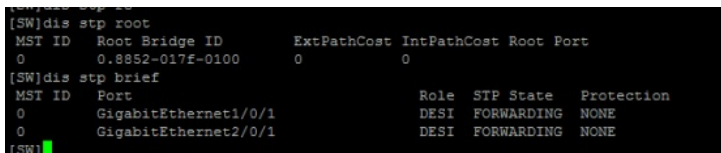[SW3-GigabitEthernet1/0/2]quit

填写PC的IP，并测试PING网关：

配置关键点

切换演练开始：
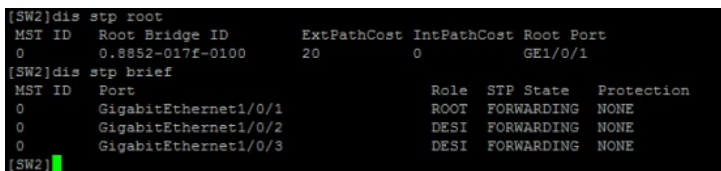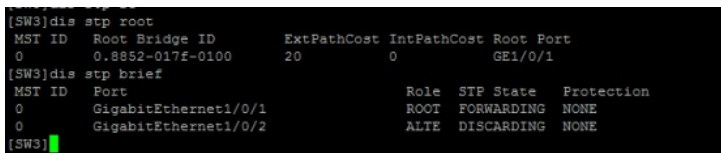在网络正常时的STP根桥和STP端口的状态如下：
SW：

```
[SW]dis stp root
MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
0        0.8852-017f-0100      0           0
[SW]dis stp brief
MST ID   Port                            Role  STP State   Protection
0        GigabitEthernet1/0/1            DESI  FORWARDING  NONE
0        GigabitEthernet2/0/1            DESI  FORWARDING  NONE
[SW]
```

SW2：

```
[SW2]dis stp root
MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
0        0.8852-017f-0100      20          0           GE1/0/1
[SW2]dis stp brief
MST ID   Port                            Role  STP State   Protection
0        GigabitEthernet1/0/1            ROOT  FORWARDING  NONE
0        GigabitEthernet1/0/2            DESI  FORWARDING  NONE
0        GigabitEthernet1/0/3            DESI  FORWARDING  NONE
[SW2]
```

SW3：

```
[SW3]dis stp root
MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
0        0.8852-017f-0100      20          0           GE1/0/1
[SW3]dis stp brief
MST ID   Port                            Role  STP State   Protection
0        GigabitEthernet1/0/1            ROOT  FORWARDING  NONE
0        GigabitEthernet1/0/2            ALTE  DISCARDING  NONE
[SW3]
```

根据SW3反馈的STP端口状态，G1/0/1为根端口，G1/0/2被阻塞掉了。
在网络正常时，根桥稳定，各端口都在正常的状态内，仅SW3的G1/0/2端口被阻塞，因此没有成环。

切换演练：
断开SW的gi 1/0/1端口，并查看STP的状态和STP端口状态：

```
[SW-GigabitEthernet1/0/1]
[SW-GigabitEthernet1/0/1]shu
[SW-GigabitEthernet1/0/1]shutdown
[SW-GigabitEthernet1/0/1]%Oct 25 12:50:31:972 2020 SW IFNET/3/PHY_UPDOWN: Physical state o
n the interface GigabitEthernet1/0/1 changed to down.
%Oct 25 12:50:31:973 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Gig
abitEthernet1/0/1 changed to down.
%Oct 25 12:50:32:537 2020 SW STP/6/STP_NOTIFIED_TC: -Slot=2; Instance 0's port GigabitEthe
rnet2/0/1 was notified a topology change.
```

SW：

```
[SW-GigabitEthernet1/0/1]dis stp ro
[SW-GigabitEthernet1/0/1]dis stp root
 MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100     0           0
[SW-GigabitEthernet1/0/1]dis stp brief
 MST ID   Port                           Role  STP State   Protection
 0        GigabitEthernet2/0/1           DESI  FORWARDING  NONE
[SW-GigabitEthernet1/0/1]
```

SW2：

```
[SW2-GigabitEthernet1/0/2]dis stp ro
[SW2-GigabitEthernet1/0/2]dis stp root
 MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100     40          0           GE1/0/2
[SW2-GigabitEthernet1/0/2]dis stp brief
 MST ID   Port                           Role  STP State   Protection
 0        GigabitEthernet1/0/2           ROOT  FORWARDING  NONE
 0        GigabitEthernet1/0/3           DESI  FORWARDING  NONE
[SW2-GigabitEthernet1/0/2]
```

根据SW2反馈的情况来看，GI 1/0/2已经切换为根端口

SW3：

```
<SW3>dis stp root
 MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100     20          0           GE1/0/1
<SW3>dis stp brief
 MST ID   Port                           Role  STP State   Protection
 0        GigabitEthernet1/0/1           ROOT  FORWARDING  NONE
 0        GigabitEthernet1/0/2           DESI  FORWARDING  NONE
<SW3>
```

SW3的根端口没有变动，因为SW3有直连链路到SW上。

PC PING 不丢包：

```
hcl_ulidfi
 S5820V2-54QS-GE_1    S5820V2-54QS-GE_2    S5820V2-54QS-GE_3    S5820V2-54QS-GE_4    PC_5
56 bytes from 192.168.10.1: icmp_seq=50 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=51 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=52 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=53 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=54 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=55 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=56 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=57 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=58 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=59 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=60 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=61 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=62 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=63 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=64 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=65 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=66 ttl=255 time=1.000 ms

--- Ping statistics for 192.168.10.1 ---
67 packet(s) transmitted, 67 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.000/1.821/7.000/0.913 ms
<H3C>%Oct 25 16:06:14:925 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 192
1: 67 packet(s) transmitted, 67 packet(s) received, 0.0% packet loss, round-trip m
ax/std-dev = 1.000/1.821/7.000/0.913 ms.
```

恢复SW的GI 1/0/1端口，并关闭GI 2/0/1端口：

```
[SW-GigabitEthernet2/0/1]shutdown
[SW-GigabitEthernet2/0/1]%Oct 25 13:41:03:521 2020 SW STP/6/STP_NOTIFIED_TC: Instance 0's
port GigabitEthernet1/0/1 was notified a topology change.
%Oct 25 13:41:03:525 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface GigabitEt
hernet2/0/1 changed to down.
%Oct 25 13:41:03:525 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Gig
abitEthernet2/0/1 changed to down.
```

查看SW：

```
[SW-GigabitEthernet2/0/1]dis stp root
 MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100     0           0
[SW-GigabitEthernet2/0/1]dis stp brief
 MST ID   Port                           Role  STP State   Protection
 0        GigabitEthernet1/0/1           DESI  FORWARDING  NONE
[SW-GigabitEthernet2/0/1]
```

SW2:

```
<SW2>dis stp root
 MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100      20          0           GE1/0/1
<SW2>dis stp brief
 MST ID   Port                            Role   STP State   Protection
 0        GigabitEthernet1/0/1            ROOT   FORWARDING  NONE
 0        GigabitEthernet1/0/2            DESI   FORWARDING  NONE
 0        GigabitEthernet1/0/3            DESI   FORWARDING  NONE
<SW2>
```

根据SW2反馈的情况来看，GI 1/0/2端口已从阻塞状态切换到指定端口

SW3:

```
[SW3-GigabitEthernet1/0/2]dis stp root
 MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100      40          0           GE1/0/2
[SW3-GigabitEthernet1/0/2]dis stp brief
 MST ID   Port                            Role   STP State   Protection
 0        GigabitEthernet1/0/2            ROOT   FORWARDING  NONE
[SW3-GigabitEthernet1/0/2]
```

根据SW3反馈的情况来看，GI 1/0/2端口已切换到根端口。

恢复网络，重新开启SW的GI 2/0/1端口：

```
[SW-GigabitEthernet2/0/1]undo shutdown
[SW-GigabitEthernet2/0/1]%Oct 25 13:16:01:223 2020 SW IFNET/3/PHY_UPDOWN: Physical state o
n the interface GigabitEthernet2/0/1 changed to up.
%Oct 25 13:16:01:224 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Gig
abitEthernet2/0/1 changed to up.
%Oct 25 13:16:01:981 2020 SW STP/6/STP_DETECTED_TC: -Slot=2; Instance 0's port GigabitEthe
rnet2/0/1 detected a topology change.
%Oct 25 13:16:02:019 2020 SW LLDP/6/LLDP_CREATE_NEIGHBOR: -Slot=2; Nearest bridge agent ne
ighbor created on port GigabitEthernet2/0/1 (IfIndex 130), neighbor's chassis ID is 8852-1
397-0400, port ID is GigabitEthernet1/0/1.
```

再次分别查看SW、SW2、SW3的状态，已正常切换回来：

```
[SW-GigabitEthernet2/0/1]dis stp root
 MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100      0           0
[SW-GigabitEthernet2/0/1]dis stp brief
 MST ID   Port                            Role   STP State   Protection
 0        GigabitEthernet1/0/1            DESI   FORWARDING  NONE
 0        GigabitEthernet2/0/1            DESI   FORWARDING  NONE
[SW-GigabitEthernet2/0/1]
```

```
<SW2>dis stp root
 MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100      20          0           GE1/0/1
<SW2>dis stp brief
 MST ID   Port                            Role   STP State   Protection
 0        GigabitEthernet1/0/1            ROOT   FORWARDING  NONE
 0        GigabitEthernet1/0/2            DESI   FORWARDING  NONE
 0        GigabitEthernet1/0/3            DESI   FORWARDING  NONE
<SW2>
```

```
<SW3>dis stp root
 MST ID   Root Bridge ID        ExtPathCost IntPathCost Root Port
 0        0.8852-017f-0100      20          0           GE1/0/1
<SW3>dis stp brief
 MST ID   Port                            Role   STP State   Protection
 0        GigabitEthernet1/0/1            ROOT   FORWARDING  NONE
 0        GigabitEthernet1/0/2            ALTE   DISCARDING  NONE
<SW3>
```

至此，S5820 RSTP典型组网配置案例2及切换演练已完成！