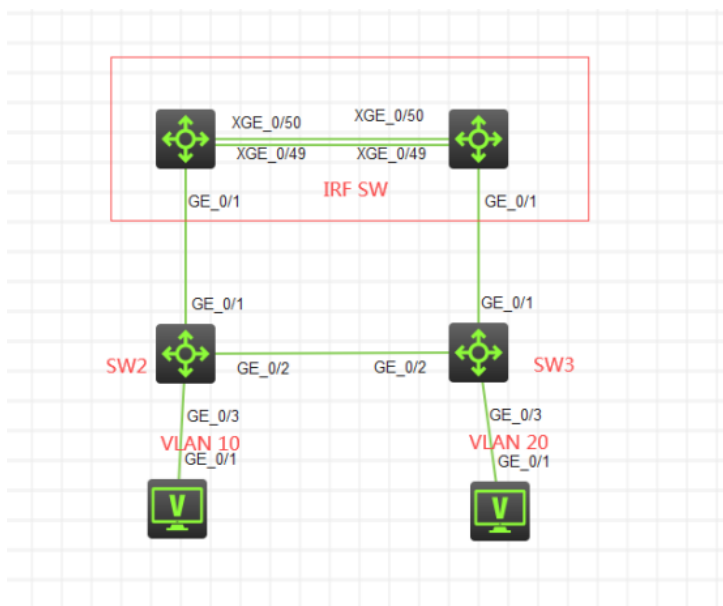


知 S5820 RSTP配置案例1 (IRF组网模式下的接入设备采用STP COST) 及切换演练

STP 韦家宁 2020-10-25 发表

组网及说明



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 COST来指定端口的开销来实现链路的“主备”，在该网络拓扑中，SW2和SW3互联的端口都配置STP COST为100，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]jrf-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]jrf-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 cost 100
[SW2-GigabitEthernet1/0/2]quit
```

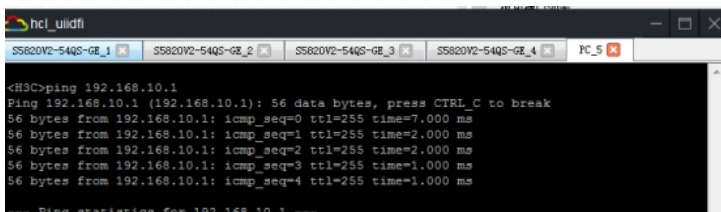
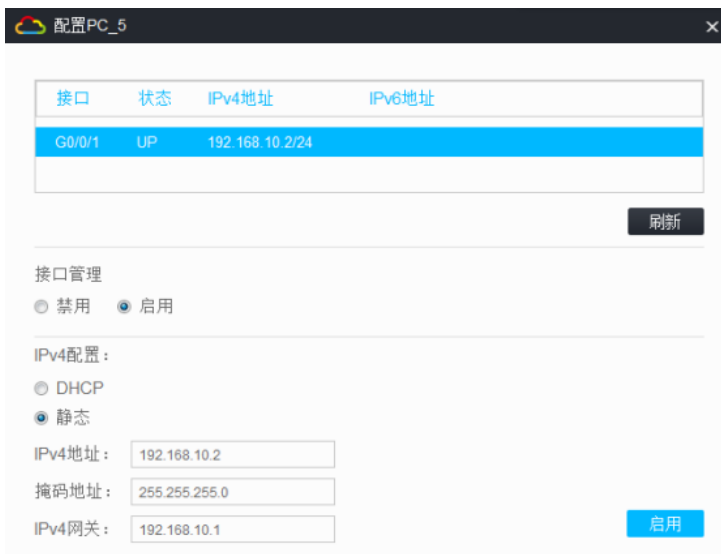
SW3配置:

```
<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 cost 100
[SW3-GigabitEthernet1/0/2]quit
```

填写PC的IP, 并测试PING网关:

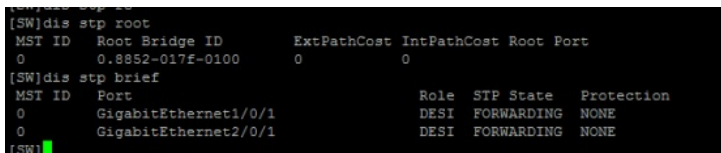


配置关键点

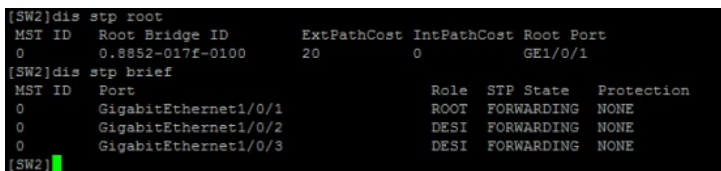
切换演练开始:

在网络正常时的STP根桥和STP端口的状态如下:

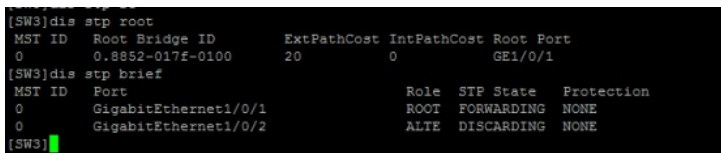
SW:



SW2:



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]shu
[SW-GigabitEthernet1/0/1]shutdown
[SW-GigabitEthernet1/0/1]%Oct 25 12:50:31:972 2020 SW IFNET/3/PHY_UPDOWN: Physical state on 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 GigabitEthernet1/0/1 changed to down.
%Oct 25 12:50:32:537 2020 SW STP/6/STP_NOTIFIED_TC: -Slot=2: Instance 0's port GigabitEthernet2/0/1 was notified a topology change.

```

SW:

```

[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>dis stp root
MST ID Root Bridge ID ExtPathCost IntPathCost Root Port
0 0.8852-017f-0100 120 0 GE1/0/2
<SW2>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>

```

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:

```

h3c1_uidf1
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=98 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=99 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=100 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=101 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=102 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=103 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=104 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=105 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=106 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=107 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=108 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=109 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=110 ttl=255 time=4.000 ms
56 bytes from 192.168.10.1: icmp_seq=111 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=112 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=113 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=114 ttl=255 time=2.000 ms

--- Ping statistics for 192.168.10.1 ---
115 packet(s) transmitted, 115 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.000/2.035/21.000/1.911 ms
<H3C>%Oct 25 15:16:17:692 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 192.168.10.1: 115 packet(s) transmitted, 115 packet(s) received, 0.0% packet loss, round-trip min/avg/max/std-dev = 1.000/2.035/21.000/1.911 ms.

```

恢复SW的GI 1/0/1端口，并关闭GI 2/0/1端口:

```

[SW]int gi 2/0/1
[SW-GigabitEthernet2/0/1]shu
[SW-GigabitEthernet2/0/1]shutdown
[SW-GigabitEthernet2/0/1]%Oct 25 13:10:30:309 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface GigabitEthernet2/0/1 changed to down.
%Oct 25 13:10:30:309 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface GigabitEthernet2/0/1 changed to down.
%Oct 25 13:10:30:312 2020 SW STP/6/STP_NOTIFIED_TC: Instance 0's port GigabitEthernet1/0/1 was notified a topology change.

```

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:

```
<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 on 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 GigabitEthernet2/0/1 changed to up.
Oct 25 13:16:01:981 2020 SW STP/6/STP_DETECTED_IC: -Slot=2; Instance 0's port GigabitEthernet2/0/1 detected a topology change.
Oct 25 13:16:02:019 2020 SW LLDP/6/LLDP_CREATE_NEIGHBOR: -Slot=2; Nearest bridge agent neighbor created on port GigabitEthernet2/0/1 (IfIndex 130), neighbor's chassis ID is 8852-1397-0400, 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1及切换演练已完成！