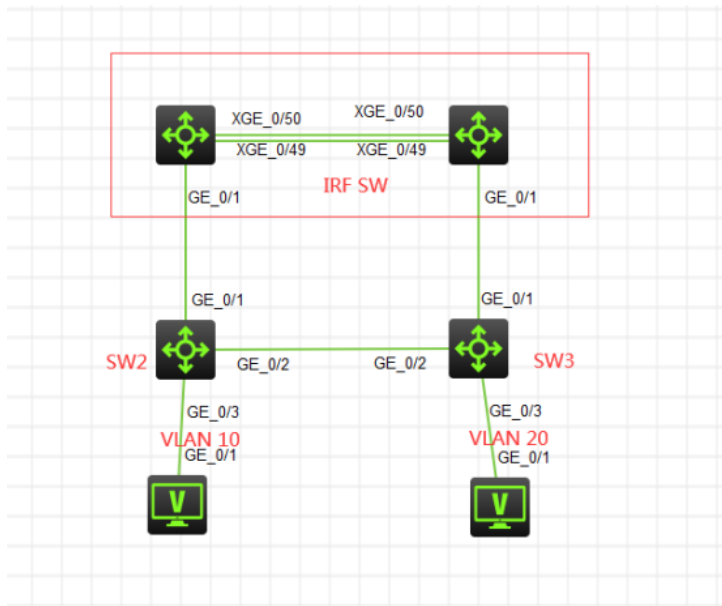


知 S5820 MSTP配置案例2（IRF组网模式下的接入设备采用STP priority）及切换演练

STP 韦家宁 2020-10-24 发表

组网及说明

网络拓扑图:



本案例采用H3C HCL模拟器来模拟MSTP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youxianji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，这样不仅能避免环路，还能实现链路冗余。

配置步骤

配置过程:

1、部署SW的IRF:

1号设备IRF部署:

```
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MSTP

```
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 mstp
[SW]stp region-configuration
[SW-mst-region]instance 1 vlan 10 20
[SW-mst-region]region-name weijianing
[SW-mst-region]active region-configuration
[SW-mst-region]quit
[SW]stp instance 1 priority 0
```

SW2配置:

```
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 mstp
[SW2]stp region-configuration
[SW2-mst-region]instance 1 vlan 10 20
[SW2-mst-region]region-name weijianing
[SW2-mst-region]active region-configuration
[SW2-mst-region]quit
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]stp instance 1 port priority 32
[SW2-GigabitEthernet1/0/2]quit
```

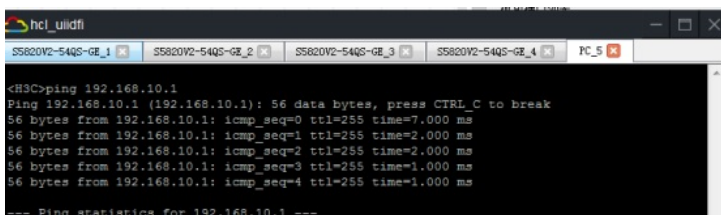
SW3配置:

```
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
```

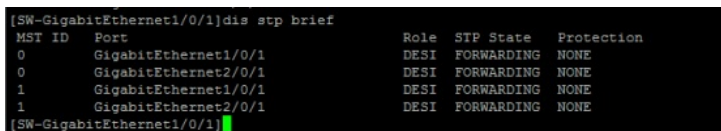
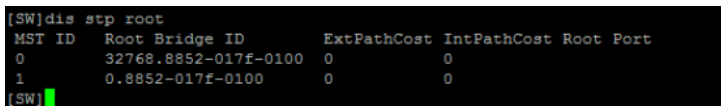
```
[SW3]stp global enable
[SW3]stp mode mstp
[SW3]stp region-configuration
[SW3-mst-region]instance 1 vlan 10 20
[SW3-mst-region]region-name weijianing
[SW3-mst-region]active region-configuration
[SW3-mst-region]quit
[SW3]int gi 1/0/2
[SW3-GigabitEthernet1/0/2]stp instance 1 port priority 32
[SW3-GigabitEthernet1/0/2]quit
```

填写PC的IP，并测试PING网关：



在网络正常时的STP根桥和STP端口的状态如下：

SW:



SW2:

```
[SW2]dis stp root
MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
0         32768.8852-017f-0100  20           0           GE1/0/1
1         32768.8852-0f8f-0300  0            0
```

```
[SW2]dis stp root
MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
0         32768.8852-017f-0100  20           0           GE1/0/1
1         32768.8852-0f8f-0300  0            0
[SW2]dis stp brief
MST ID   Port                    Role   STP State  Protection
0        GigabitEthernet1/0/1    ROOT  FORWARDING NONE
0        GigabitEthernet1/0/2    ALTE  DISCARDING NONE
0        GigabitEthernet1/0/3    DESI  FORWARDING NONE
1        GigabitEthernet1/0/1    MAST  FORWARDING NONE
1        GigabitEthernet1/0/2    ALTE  DISCARDING NONE
1        GigabitEthernet1/0/3    DESI  FORWARDING NONE
[SW2]
```

根据SW2反馈的STP端口状态，G1/0/1为根端口，G1/0/2被阻塞掉了。

SW3:

```
[SW3]dis stp root
MST ID   Root Bridge ID       ExtPathCost IntPathCost Root Port
0         32768.8852-017f-0100  0            20          GE1/0/1
1         0.8852-017f-0100     0            20          GE1/0/1
[SW3]
```

```
[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
1        GigabitEthernet1/0/1    ROOT  FORWARDING NONE
1        GigabitEthernet1/0/2    DESI  FORWARDING NONE
[SW3]
```

在网络正常时，根桥稳定，各端口都在正常的状态内，仅SW2的G1/0/2端口被阻塞，因此没有成环。

配置关键点

切换演练开始:

断开SW的gi 1/0/1端口，并查看STP的状态和STP端口状态:

```
[SW]int gi 1/0/1
[SW-GigabitEthernet1/0/1]shu
[SW-GigabitEthernet1/0/1]shutdown
[SW-GigabitEthernet1/0/1]Oct 24 10:33:48:260 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface GigabitEthernet1/0/1 changed to down.
%Oct 24 10:33:48:261 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface GigabitEthernet1/0/1 changed to down.
%Oct 24 10:33:48:263 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface Vlan-interface10 changed to down.
%Oct 24 10:33:48:263 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface Vlan-interface20 changed to down.
%Oct 24 10:33:48:264 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Vlan-interface10 changed to down.
%Oct 24 10:33:48:264 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Vlan-interface20 changed to down.
%Oct 24 10:33:48:493 2020 SW STP/6/STP_NOTIFIED_IC: -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         32768.8852-017f-0100  0            0
1         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
1        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         32768.8852-017f-0100  100          0           GE1/0/2
1         32768.8852-0f8f-0300  0            0
[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
1        GigabitEthernet1/0/2    MAST  FORWARDING NONE
1        GigabitEthernet1/0/3    DESI  FORWARDING NONE
[SW2]
```

根据SW2反馈的情况来看，GI 1/0/2已经切换为根端口和主端口

SW3:

```
[SW3]dis stp root
MST ID   Root Bridge ID      ExtPathCost  IntPathCost  Root Port
0        32768.8852-017f-0100  0            20           GE1/0/1
1        0.8852-017f-0100    0            20           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
1        GigabitEthernet1/0/1  ROOT  FORWARDING NONE
1        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 无丢包：

```
hcl_uidfi
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=5 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=6 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=7 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=8 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=9 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=10 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=11 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=12 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=13 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=14 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=15 ttl=255 time=4.000 ms
56 bytes from 192.168.10.1: icmp_seq=16 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=17 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=18 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=19 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=20 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=21 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=22 ttl=255 time=4.000 ms
56 bytes from 192.168.10.1: icmp_seq=23 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=24 ttl=255 time=4.000 ms
56 bytes from 192.168.10.1: icmp_seq=25 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=26 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=27 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=28 ttl=255 time=2.000 ms
```

```
--- Ping statistics for 192.168.10.1 ---
134 packet(s) transmitted, 134 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.000/2.209/9.000/1.228 ms
<H3C>Oct 24 10:57:29:095 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 192.168.10.1: 134 packet(s) transmitted, 134 packet(s) received, 0.0% packet loss, round-trip min/avg/max/std-dev = 1.000/2.209/9.000/1.228 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 24 10:36:15:938 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface GigabitEthernet2/0/1 changed to down.
Oct 24 10:36:15:938 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface GigabitEthernet2/0/1 changed to down.
Oct 24 10:36:15:942 2020 SW STP/6/STP_NOTIFIED_IC: 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        32768.8852-017f-0100  0            0
1        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
1        GigabitEthernet1/0/1  DESI  FORWARDING NONE
SW-GigabitEthernet2/0/1]
```

SW2:

```
[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
1        GigabitEthernet1/0/1  MAST  FORWARDING NONE
1        GigabitEthernet1/0/2  DESI  FORWARDING NONE
1        GigabitEthernet1/0/3  DESI  FORWARDING NONE
[SW2]dis stp ro
[SW2]dis stp root
MST ID   Root Bridge ID      ExtPathCost  IntPathCost  Root Port
0        32768.8852-017f-0100  20           0            GE1/0/1
1        32768.8852-0f8f-0300  0            0
```

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]dis stp root
MST ID   Root Bridge ID       ExtPathCost  IntPathCost  Root Port
0        32768.8852-017f-0100  120         0            GE1/0/2
1        32768.8852-1397-0400  0           0
[SW3]dis stp brief
MST ID   Port                    Role  STP State  Protection
0        GigabitEthernet1/0/2    ROOT FORWARDING NONE
1        GigabitEthernet1/0/2    MAST FORWARDING NONE
[SW3]
```

根据SW3反馈的情况来看，GI 1/0/2端口已切换到根端口和主端口。

```
[SW3]dis stp root
MST ID   Root Bridge ID       ExtPathCost  IntPathCost  Root Port
0        32768.8852-017f-0100  120         0            GE1/0/2
1        32768.8852-1397-0400  0           0
[SW3]dis stp brief
MST ID   Port                    Role  STP State  Protection
0        GigabitEthernet1/0/2    ROOT FORWARDING NONE
1        GigabitEthernet1/0/2    MAST FORWARDING NONE
[SW3]
```

恢复网络，重新开启SW的GI 2/0/1端口：

```
[SW]int gi 2/0/1
[SW-GigabitEthernet2/0/1]undo shu
[SW-GigabitEthernet2/0/1]undo shutdown
[SW-GigabitEthernet2/0/1]#Oct 24 10:38:36:2020 SW IFNET/3/PHY_UPDOWN: Physical state of
n the interface GigabitEthernet2/0/1 changed to up.
#Oct 24 10:38:36:329 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Gig
abitEthernet2/0/1 changed to up.
#Oct 24 10:38:36:485 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.
[SW]
```

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        32768.8852-017f-0100  0           0
1        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
1        GigabitEthernet1/0/1    DESI FORWARDING NONE
1        GigabitEthernet2/0/1    DESI FORWARDING NONE
[SW-GigabitEthernet2/0/1]
```

```
[SW2]dis stp root
MST ID   Root Bridge ID       ExtPathCost  IntPathCost  Root Port
0        32768.8852-017f-0100  20         0            GE1/0/1
1        32768.8852-0f8f-0300  0           0
[SW2]dis stp brief
MST ID   Port                    Role  STP State  Protection
0        GigabitEthernet1/0/1    ROOT FORWARDING NONE
0        GigabitEthernet1/0/2    ALTE DISCARDING NONE
0        GigabitEthernet1/0/3    DESI FORWARDING NONE
1        GigabitEthernet1/0/1    MAST FORWARDING NONE
1        GigabitEthernet1/0/2    ALTE DISCARDING NONE
1        GigabitEthernet1/0/3    DESI FORWARDING NONE
[SW2]
```

```
[SW3]dis stp root
MST ID   Root Bridge ID       ExtPathCost  IntPathCost  Root Port
0        32768.8852-017f-0100  0           20         GE1/0/1
1        0.8852-017f-0100     0           20         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
1        GigabitEthernet1/0/1    ROOT FORWARDING NONE
1        GigabitEthernet1/0/2    DESI FORWARDING NONE
[SW3]
```

至此，S5820 MSTP典型组网配置案例2及切换演练已完成！