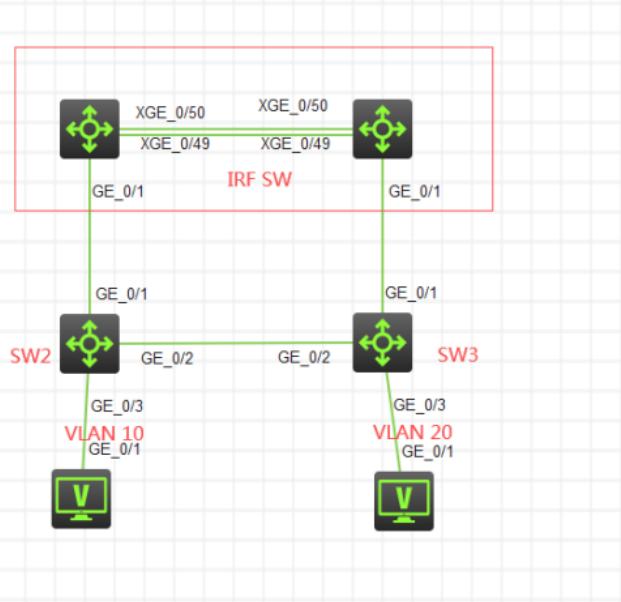


知 S5820 PVST配置案例2 (IRF组网模式下的接入设备采用STP priority) 及切换演练

PVST 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PVST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PVST

```

<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 pvst
[SW]stp vlan 10 20 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 pvst
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]stp vlan 10 20 port priority 32
[SW2-GigabitEthernet1/0/2]quit
```

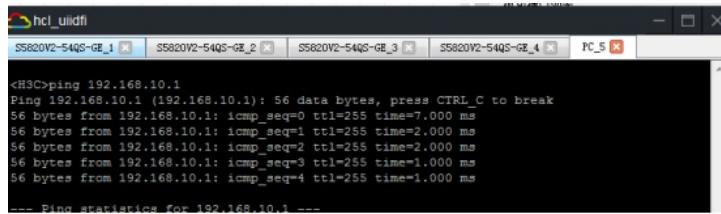
SW3配置：

```
<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 pvst
[SW3]int gi 1/0/2
[SW3-GigabitEthernet1/0/2]stp vlan 10 20 port priority 32
[SW3-GigabitEthernet1/0/2]quit
```

填写PC的IP，并测试PING网关：



配置关键点

在网络正常时的STP根桥和STP端口的状态如下：

SW:

```
[SW]dis stp root
VLAN ID Root Bridge ID      ExtPathCost IntPathCost Root Port
1       32768.8852-017f-0100  0           0
10      0.8852-017f-0100    0           0
20      0.8852-017f-0100    0           0

[SW]dis stp brief
VLAN ID Port                  Role   STP State   Protection
10       GigabitEthernet1/0/1  DESI   FORWARDING  NONE
10       GigabitEthernet2/0/1  DESI   FORWARDING  NONE
20       GigabitEthernet1/0/1  DESI   FORWARDING  NONE
20       GigabitEthernet2/0/1  DESI   FORWARDING  NONE
```

SW2:

```
[SW2-GigabitEthernet1/0/2]dis stp root
VLAN ID Root Bridge ID      ExtPathCost IntPathCost Root Port
1       32768.8852-0f8f-0300  0           0
10      0.8852-017f-0100    0           20        GE1/0/1
20      0.8852-017f-0100    0           20        GE1/0/1

[SW2-GigabitEthernet1/0/2]dis stp brief
VLAN ID Port                  Role   STP State   Protection
10       GigabitEthernet1/0/1  ROOT   FORWARDING  NONE
10       GigabitEthernet1/0/2  DESI   FORWARDING  NONE
10       GigabitEthernet1/0/3  DESI   FORWARDING  NONE
20       GigabitEthernet1/0/1  ROOT   FORWARDING  NONE
20       GigabitEthernet1/0/2  DESI   FORWARDING  NONE
```

SW3:

```
[SW3]dis stp root
VLAN ID Root Bridge ID      ExtPathCost IntPathCost Root Port
 1      32768.8852-1397-0400 0          0
 10     0.8852-017f-0100    0          20      GE1/0/1
 20     0.8852-017f-0100    0          20      GE1/0/1

[SW3]dis stp brief
VLAN ID Port                  Role STP State Protection
 10    GigabitEthernet1/0/1    ROOT FORWARDING NONE
 10    GigabitEthernet1/0/2    ALTE DISCARDING NONE
 20    GigabitEthernet1/0/1    ROOT FORWARDING NONE
 20    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]int gi 1/0/1
[SW-GigabitEthernet1/0/1]shu
[SW-GigabitEthernet1/0/1]shutdown
[SW-GigabitEthernet1/0/1]Oct 25 14:57:25:115 2020 SW IFNET/3/PHY_UPDOWN: Physical state o
n the interface GigabitEthernet1/0/1 changed to down.
%Oct 25 14:57:25:116 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface Gi
abitEthernet1/0/1 changed to down.
```

SW:

```
[SW-GigabitEthernet1/0/1]dis stp root
VLAN ID Root Bridge ID      ExtPathCost IntPathCost Root Port
 1      32768.8852-017f-0100 0          0
 10     0.8852-017f-0100    0          0
 20     0.8852-017f-0100    0          0

[SW-GigabitEthernet1/0/1]dis stp brief
VLAN ID Port                  Role STP State Protection
 10    GigabitEthernet2/0/1    DESI FORWARDING NONE
 20    GigabitEthernet2/0/1    DESI FORWARDING NONE

[SW-GigabitEthernet1/0/1]
```

SW2:

```
[SW2]dis stp root
VLAN ID Root Bridge ID      ExtPathCost IntPathCost Root Port
 1      32768.8852-0f8f-0300 0          0
 10     0.8852-017f-0100    0          40      GE1/0/2
 20     0.8852-017f-0100    0          40      GE1/0/2

[SW2]dis stp brief
VLAN ID Port                  Role STP State Protection
 10    GigabitEthernet1/0/2    ROOT FORWARDING NONE
 10    GigabitEthernet1/0/3    DESI FORWARDING NONE
 20    GigabitEthernet1/0/2    ROOT 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
VLAN ID Root Bridge ID      ExtPathCost IntPathCost Root Port
 1      32768.8852-1397-0400 0          0
 10     0.8852-017f-0100    0          20      GE1/0/1
 20     0.8852-017f-0100    0          20      GE1/0/1

[SW3]dis stp brief
VLAN ID Port                  Role STP State Protection
 10    GigabitEthernet1/0/1    ROOT FORWARDING NONE
 10    GigabitEthernet1/0/2    DESI FORWARDING NONE
 20    GigabitEthernet1/0/1    ROOT FORWARDING NONE
 20    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：

```

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=183 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=184 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=185 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=186 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=187 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=188 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=189 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=190 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=191 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=192 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=193 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=194 ttl=255 time=1.000 ms
56 bytes from 192.168.10.1: icmp_seq=195 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=196 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=197 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=198 ttl=255 time=3.000 ms
56 bytes from 192.168.10.1: icmp_seq=199 ttl=255 time=2.000 ms
56 bytes from 192.168.10.1: icmp_seq=200 ttl=255 time=2.000 ms

--- Ping statistics for 192.168.10.1 ---
200 packet(s) transmitted, 200 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.000/2.140/7.000/0.938 ms
<H3C>Oct 25 17:35:07:905 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 192.168.10.1: 200 packet(s) transmitted, 200 packet(s) received, 0.0% packet loss, round-trip min/avg/max/std-dev = 1.000/2.140/7.000/0.938 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 14:58:59:091 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface GigabitEthernet2/0/1 changed to down.
#Oct 25 14:58:59:093 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface GigabitEthernet2/0/1 changed to down.

```

查看SW：

```

[SW-GigabitEthernet2/0/1]#dis stp root
VLAN ID Root Bridge ID          ExtPathCost IntPathCost Root Port
1      32768.8852-017f-0100    0            0
10     0.8852-017f-0100       0            0
20     0.8852-017f-0100       0            0
[SW-GigabitEthernet2/0/1]#dis stp brief
VLAN ID Port                  Role  STP State   Protection
10      GigabitEthernet1/0/1    DESI FORWARDING NONE
20      GigabitEthernet1/0/1    DESI FORWARDING NONE
[SW-GigabitEthernet2/0/1]

```

SW2:

```

[SW2-GigabitEthernet1/0/2]#dis stp root
VLAN ID Root Bridge ID          ExtPathCost IntPathCost Root Port
1      32768.8852-0f8f-0300    0            0
10     0.8852-017f-0100       0            20           GE1/0/1
20     0.8852-017f-0100       0            20           GE1/0/1
[SW2-GigabitEthernet1/0/2]#dis stp brief
VLAN ID Port                  Role  STP State   Protection
10      GigabitEthernet1/0/1    ROOT FORWARDING NONE
10      GigabitEthernet1/0/2    DESI FORWARDING NONE
10      GigabitEthernet1/0/3    DESI FORWARDING NONE
20      GigabitEthernet1/0/1    ROOT FORWARDING NONE
20      GigabitEthernet1/0/2    DESI FORWARDING NONE
[SW2-GigabitEthernet1/0/2]

```

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
VLAN ID Root Bridge ID          ExtPathCost IntPathCost Root Port
1      32768.8852-1397-0400    0            0
10     0.8852-017f-0100       0            40           GE1/0/2
20     0.8852-017f-0100       0            40           GE1/0/2
[SW3-GigabitEthernet1/0/2]#dis stp brief
VLAN ID Port                  Role  STP State   Protection
10      GigabitEthernet1/0/2    ROOT FORWARDING NONE
20      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 14:59:56:992 2020 SW IFNET/3/PHY_UPDOWN: Physical state on the interface GigabitEthernet2/0/1 changed to up.
#Oct 25 14:59:56:992 2020 SW IFNET/5/LINK_UPDOWN: Line protocol state on the interface GigabitEthernet2/0/1 changed to up.
#Oct 25 14:59:57:645 2020 SW LLDP/6/LLDP_CREATE_NEIGHBOR: -Slot2; Nearest bridge agent neighbor created on port GigabitEthernet2/0/1 (IfIndex 130), neighbor's chassis ID is 0852-397-0400, port ID is GigabitEthernet1/0/1.

[SW-GigabitEthernet2/0/1]

```

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
VLAN ID Root Bridge ID          ExtPathCost IntPathCost Root Port
 1      32768.8852-017f-0100    0            0
10     0.8852-017f-0100        0            0
20     0.8852-017f-0100        0            0
[SW-GigabitEthernet2/0/1]dis stp brief
VLAN ID Port                  Role STP State Protection
10      GigabitEthernet1/0/1    DESI FORWARDING NONE
10      GigabitEthernet2/0/1    DESI FORWARDING NONE
20      GigabitEthernet1/0/1    DESI FORWARDING NONE
20      GigabitEthernet2/0/1    DESI FORWARDING NONE
[SW-GigabitEthernet2/0/1]
```

```
[SW2-GigabitEthernet1/0/2]dis stp root
VLAN ID Root Bridge ID          ExtPathCost IntPathCost Root Port
 1      32768.8852-0f8f-0300    0            0
10     0.8852-017f-0100        0            20           GE1/0/1
20     0.8852-017f-0100        0            20           GE1/0/1
[SW2-GigabitEthernet1/0/2]dis stp brief
VLAN ID Port                  Role STP State Protection
10      GigabitEthernet1/0/1    ROOT FORWARDING NONE
10      GigabitEthernet1/0/2    DESI FORWARDING NONE
10      GigabitEthernet1/0/3    DESI FORWARDING NONE
20      GigabitEthernet1/0/1    ROOT FORWARDING NONE
20      GigabitEthernet1/0/2    DESI FORWARDING NONE
[SW2-GigabitEthernet1/0/2]
```

```
[SW3]dis stp root
VLAN ID Root Bridge ID          ExtPathCost IntPathCost Root Port
 1      32768.8852-1397-0400    0            0
10     0.8852-017f-0100        0            20           GE1/0/1
20     0.8852-017f-0100        0            20           GE1/0/1
[SW3]dis stp brief
VLAN ID Port                  Role STP State Protection
10      GigabitEthernet1/0/1    ROOT FORWARDING NONE
10      GigabitEthernet1/0/2    ALTE DISCARDING NONE
20      GigabitEthernet1/0/1    ROOT FORWARDING NONE
20      GigabitEthernet1/0/2    ALTE DISCARDING NONE
[SW3]
```

至此，S5820 PVST典型组网配置案例2及切换演练已完成！