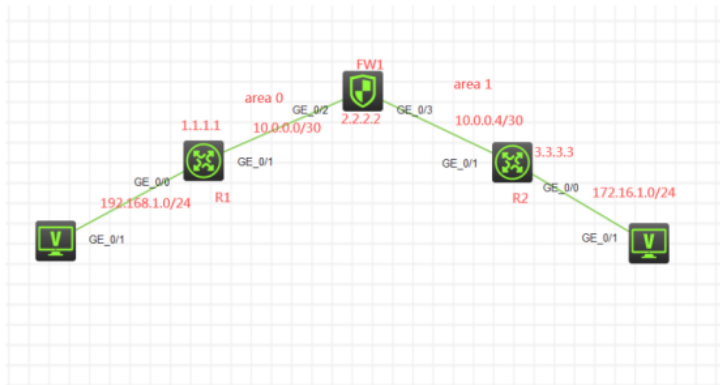


知 F1060路由模式典型组网配置案例5 (多区域OSPF)

设备部署方式 H3C模拟器 韦家宁 2020-03-29 发表

组网及说明



组网说明:

本案例采用H3C HCL模拟器的F1060防火墙来模拟防火墙路由模式的典型部署。为了实现PC之间能够相互通信,因此需要分别在R1、R2、FW1采用三层互联,同时FW1采用路由模式,最终实现PC之间能够相互PING通。

配置步骤

- 1、按照网络拓扑图正确配置IP地址
- 2、R1、FW1、R2之间采用三层互联
- 3、R1、FW1、R2之间采用多区域OSPF路由协议实现互通。

配置关键点

R1:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname R1
[R1]int gi 0/0
[R1-GigabitEthernet0/0]ip address 192.168.1.1 24
[R1-GigabitEthernet0/0]quit
[R1]int gi 0/1
[R1-GigabitEthernet0/1]des <connect to FW1>
[R1-GigabitEthernet0/1]ip address 10.0.0.1 30
[R1-GigabitEthernet0/1]quit
[R1]int loopback 0
[R1-LoopBack0]ip address 1.1.1.1 32
[R1-LoopBack0]quit
[R1]ospf 1 router-id 1.1.1.1
[R1-ospf-1]area 0.0.0.0
[R1-ospf-1-area-0.0.0.0]network 10.0.0.1 0.0.0.0
[R1-ospf-1-area-0.0.0.0]network 1.1.1.1 0.0.0.0
[R1-ospf-1-area-0.0.0.0]network 192.168.1.0 0.0.0.255
[R1-ospf-1-area-0.0.0.0]quit
[R1-ospf-1]quit
```

R2:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname R2
[R2]int gi 0/0
[R2-GigabitEthernet0/0]ip address 172.16.1.1 24
[R2-GigabitEthernet0/0]quit
[R2]int gi 0/1
[R2-GigabitEthernet0/1]des <connect to FW1>
[R2-GigabitEthernet0/1]ip address 10.0.0.5 30
[R2-GigabitEthernet0/1]quit
[R2]int loopback 0
```

```
[R2-LoopBack0]ip address 3.3.3.3 32
[R2-LoopBack0]quit
[R2]ospf 1 router-id 3.3.3.3
[R2-ospf-1]area 0.0.0.1
[R2-ospf-1-area-0.0.0.1]network 10.0.0.5 0.0.0.0
[R2-ospf-1-area-0.0.0.1]network 3.3.3.3 0.0.0.0
[R2-ospf-1-area-0.0.0.1]network 172.16.1.0 0.0.0.255
[R2-ospf-1-area-0.0.0.1]quit
[R2-ospf-1]quit
```

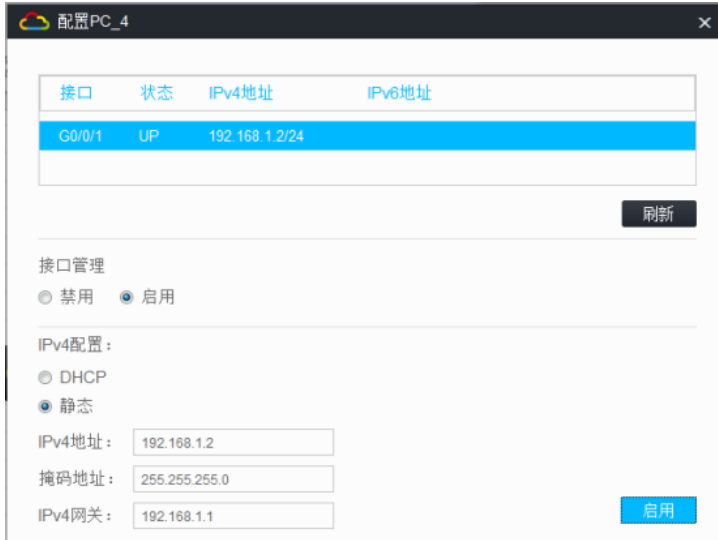
FW1 :

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname FW1
[FW1]acl basic 2002
[FW1-acl-ipv4-basic-2002]rule 0 permit source any
[FW1-acl-ipv4-basic-2002]quit
[FW1]
[FW1]zone-pair security source trust destination untrust
[FW1-zone-pair-security-Trust-Untrust]packet-filter 2002
[FW1-zone-pair-security-Trust-Untrust]quit
[FW1]
[FW1]zone-pair security source untrust destination trust
[FW1-zone-pair-security-Untrust-Trust]packet-filter 2002
[FW1-zone-pair-security-Untrust-Trust]quit
[FW1]
[FW1]zone-pair security source trust destination local
[FW1-zone-pair-security-Trust-Local]packet-filter 2002
[FW1-zone-pair-security-Trust-Local]quit
[FW1]
[FW1]zone-pair security source local destination trust
[FW1-zone-pair-security-Local-Trust]packet-filter 2002
[FW1-zone-pair-security-Local-Trust]quit
[FW1]
[FW1]zone-pair security source untrust destination local
[FW1-zone-pair-security-Untrust-Local]packet-filter 2002
[FW1-zone-pair-security-Untrust-Local]quit
[FW1]
[FW1]zone-pair security source local destination untrust
[FW1-zone-pair-security-Local-Untrust]packet-filter 2002
[FW1-zone-pair-security-Local-Untrust]quit
[FW1]
[FW1]zone-pair security source trust destination trust
[FW1-zone-pair-security-Trust-Trust]packet-filter 2002
[FW1-zone-pair-security-Trust-Trust]quit
[FW1]
[FW1]zone-pair security source untrust destination untrust
[FW1-zone-pair-security-Untrust-Untrust]packet-filter 2002
[FW1-zone-pair-security-Untrust-Untrust]quit
[FW1]int loopback 0
[FW1-LoopBack0]ip address 2.2.2.2 32
[FW1-LoopBack0]quit
[FW1]int gi 1/0/2
[FW1-GigabitEthernet1/0/2]des <connect to R1>
[FW1-GigabitEthernet1/0/2]ip address 10.0.0.2 30
[FW1-GigabitEthernet1/0/2]quit
[FW1]int gi 1/0/3
[FW1-GigabitEthernet1/0/3]des <connect to R2>
[FW1-GigabitEthernet1/0/3]ip address 10.0.0.6 30
[FW1-GigabitEthernet1/0/3]quit
[FW1]security-zone name Trust
[FW1-security-zone-Trust]import interface GigabitEthernet 1/0/2
[FW1-security-zone-Trust]import interface loopback 0
[FW1-security-zone-Trust]quit
```

```
[FW1]security-zone name Untrust
[FW1-security-zone-Untrust]import interface GigabitEthernet 1/0/3
[FW1-security-zone-Untrust]quit
[FW1]ospf 1 router-id 2.2.2.2
[FW1-ospf-1]area 0.0.0.0
[FW1-ospf-1-area-0.0.0.0]network 10.0.0.2 0.0.0.0
[FW1-ospf-1-area-0.0.0.0]network 2.2.2.2 0.0.0.0
[FW1-ospf-1-area-0.0.0.0]quit
[FW1-ospf-1]area 0.0.0.1
[FW1-ospf-1-area-0.0.0.1]network 10.0.0.6 0.0.0.0
[FW1-ospf-1-area-0.0.0.1]quit
[FW1-ospf-1]quit
```

测试:

PC都填写IP地址:



PC之间可以相互PING通:

```

hcl_qcwrmy
MSR36-20_1 MSR36-20_2 F1060_3 PC_4 PC_5
<H3C>Mar 29 09:23:35:581 2020 H3C SHELL/5/SHELL_LOGIN: Console logged in from con0.
<H3C>
<H3C>
<H3C>ping 172.16.1.2
Ping 172.16.1.2 (172.16.1.2): 56 data bytes, press CTRL_C to break
56 bytes from 172.16.1.2: icmp_seq=0 ttl=252 time=3.000 ms
56 bytes from 172.16.1.2: icmp_seq=1 ttl=252 time=3.000 ms
56 bytes from 172.16.1.2: icmp_seq=2 ttl=252 time=4.000 ms
56 bytes from 172.16.1.2: icmp_seq=3 ttl=252 time=3.000 ms
56 bytes from 172.16.1.2: icmp_seq=4 ttl=252 time=3.000 ms

--- Ping statistics for 172.16.1.2 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 3.000/3.200/4.000/0.400 ms
<H3C>Mar 29 09:23:48:465 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 172.16.1.2:
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-trip min/avg/max/
std-dev = 3.000/3.200/4.000/0.400 ms.

```

```

hcl_qcwrmy
MSR36-20_1 MSR36-20_2 F1060_3 PC_4 PC_5
<H3C>Mar 29 09:23:42:560 2020 H3C SHELL/5/SHELL_LOGIN: Console logged in from con0.
<H3C>ping 192.168.1.2
Ping 192.168.1.2 (192.168.1.2): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.1.2: icmp_seq=0 ttl=252 time=5.000 ms
56 bytes from 192.168.1.2: icmp_seq=1 ttl=252 time=3.000 ms
56 bytes from 192.168.1.2: icmp_seq=2 ttl=252 time=3.000 ms
56 bytes from 192.168.1.2: icmp_seq=3 ttl=252 time=4.000 ms
56 bytes from 192.168.1.2: icmp_seq=4 ttl=252 time=4.000 ms

--- Ping statistics for 192.168.1.2 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 3.000/3.800/5.000/0.748 ms
<H3C>Mar 29 09:24:06:924 2020 H3C PING/6/PING_STATISTICS: Ping statistics for 192.168.1.2
: 5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-trip min/avg/max/
std-dev = 3.000/3.800/5.000/0.748 ms.

```

分别查看R1、R2、FW1的OSPF邻居信息：

```

[R1]dis ospf peer

      OSPF Process 1 with Router ID 1.1.1.1
      Neighbor Brief Information

Area: 0.0.0.0
Router ID      Address      Pri Dead-Time  State      Interface
2.2.2.2        10.0.0.2    1 32          Full/BDR   GE0/1

```

```

[R2]dis ospf peer

      OSPF Process 1 with Router ID 3.3.3.3
      Neighbor Brief Information

Area: 0.0.0.1
Router ID      Address      Pri Dead-Time  State      Interface
2.2.2.2        10.0.0.6    1 39          Full/BDR   GE0/1

```

```

[FW1]dis ospf peer

      OSPF Process 1 with Router ID 2.2.2.2
      Neighbor Brief Information

Area: 0.0.0.0
Router ID      Address      Pri Dead-Time  State      Interface
1.1.1.1        10.0.0.1    1 35          Full/DR    GE1/0/2

Area: 0.0.0.1
Router ID      Address      Pri Dead-Time  State      Interface
3.3.3.3        10.0.0.5    1 34          Full/DR    GE1/0/3

```

分别查看R1、R2、FW1的路由表：

```
[R1]dis ip routing-table
Destinations : 21          Routes : 21

Destination/Mask    Proto  Pre  Cost           NextHop           Interface
0.0.0.0/32          Direct 0    0              127.0.0.1         InLoop0
1.1.1.1/32          Direct 0    0              127.0.0.1         InLoop0
2.2.2.2/32          O_INTRA 10  1              10.0.0.2          GE0/1
3.3.3.3/32          O_INTER 10  2              10.0.0.2          GE0/1
10.0.0.0/30         Direct 0    0              10.0.0.1          GE0/1
10.0.0.0/32         Direct 0    0              10.0.0.1          GE0/1
10.0.0.1/32         Direct 0    0              127.0.0.1         InLoop0
10.0.0.3/32         Direct 0    0              10.0.0.1          GE0/1
10.0.0.4/30         O_INTER 10  2              10.0.0.2          GE0/1
127.0.0.0/8         Direct 0    0              127.0.0.1         InLoop0
127.0.0.0/32        Direct 0    0              127.0.0.1         InLoop0
127.0.0.1/32        Direct 0    0              127.0.0.1         InLoop0
127.255.255.255/32 Direct 0    0              127.0.0.1         InLoop0
172.16.1.0/24       O_INTER 10  3              10.0.0.2          GE0/1
192.168.1.0/24      Direct 0    0              192.168.1.1       GE0/0
192.168.1.0/32      Direct 0    0              192.168.1.1       GE0/0
192.168.1.1/32      Direct 0    0              127.0.0.1         InLoop0
192.168.1.255/32    Direct 0    0              192.168.1.1       GE0/0
224.0.0.0/4         Direct 0    0              0.0.0.0           NULL0
224.0.0.0/24        Direct 0    0              0.0.0.0           NULL0
255.255.255.255/32 Direct 0    0              127.0.0.1         InLoop0
[R1]
```

```
[R2]dis ip routing-table
Destinations : 21          Routes : 21

Destination/Mask    Proto  Pre  Cost           NextHop           Interface
0.0.0.0/32          Direct 0    0              127.0.0.1         InLoop0
1.1.1.1/32          O_INTER 10  2              10.0.0.6          GE0/1
2.2.2.2/32          O_INTER 10  1              10.0.0.6          GE0/1
3.3.3.3/32          Direct 0    0              127.0.0.1         InLoop0
10.0.0.0/30         O_INTER 10  2              10.0.0.6          GE0/1
10.0.0.4/30         Direct 0    0              10.0.0.5          GE0/1
10.0.0.4/32         Direct 0    0              10.0.0.5          GE0/1
10.0.0.5/32         Direct 0    0              127.0.0.1         InLoop0
10.0.0.7/32         Direct 0    0              10.0.0.5          GE0/1
127.0.0.0/8         Direct 0    0              127.0.0.1         InLoop0
127.0.0.0/32        Direct 0    0              127.0.0.1         InLoop0
127.0.0.1/32        Direct 0    0              127.0.0.1         InLoop0
127.255.255.255/32 Direct 0    0              127.0.0.1         InLoop0
172.16.1.0/24       Direct 0    0              172.16.1.1       GE0/0
172.16.1.0/32       Direct 0    0              172.16.1.1       GE0/0
172.16.1.1/32       Direct 0    0              127.0.0.1         InLoop0
172.16.1.255/32     Direct 0    0              172.16.1.1       GE0/0
192.168.1.0/24      O_INTER 10  3              10.0.0.6          GE0/1
224.0.0.0/4         Direct 0    0              0.0.0.0           NULL0
224.0.0.0/24        Direct 0    0              0.0.0.0           NULL0
255.255.255.255/32 Direct 0    0              127.0.0.1         InLoop0
[R2]
```

```
[FW1]dis ip routing-table
Destinations : 21          Routes : 21

Destination/Mask    Proto  Pre  Cost           NextHop           Interface
0.0.0.0/32          Direct 0    0              127.0.0.1         InLoop0
1.1.1.1/32          O_INTRA 10  1              10.0.0.1          GE1/0/2
2.2.2.2/32          Direct 0    0              127.0.0.1         InLoop0
3.3.3.3/32          O_INTRA 10  1              10.0.0.5          GE1/0/3
10.0.0.0/30         Direct 0    0              10.0.0.2          GE1/0/2
10.0.0.0/32         Direct 0    0              10.0.0.2          GE1/0/2
10.0.0.2/32         Direct 0    0              127.0.0.1         InLoop0
10.0.0.3/32         Direct 0    0              10.0.0.2          GE1/0/2
10.0.0.4/30         Direct 0    0              10.0.0.6          GE1/0/3
10.0.0.4/32         Direct 0    0              10.0.0.6          GE1/0/3
10.0.0.6/32         Direct 0    0              127.0.0.1         InLoop0
10.0.0.7/32         Direct 0    0              10.0.0.6          GE1/0/3
127.0.0.0/8         Direct 0    0              127.0.0.1         InLoop0
127.0.0.0/32        Direct 0    0              127.0.0.1         InLoop0
127.0.0.1/32        Direct 0    0              127.0.0.1         InLoop0
127.255.255.255/32 Direct 0    0              127.0.0.1         InLoop0
172.16.1.0/24       O_INTRA 10  2              10.0.0.5          GE1/0/3
192.168.1.0/24      O_INTRA 10  2              10.0.0.1          GE1/0/2
224.0.0.0/4         Direct 0    0              0.0.0.0           NULL0
224.0.0.0/24        Direct 0    0              0.0.0.0           NULL0
255.255.255.255/32 Direct 0    0              127.0.0.1         InLoop0
[FW1]
```

至此，F106路由模式典型组网配置案例5（多区域OSPF）已完成！