

知 F1060路由模式典型组网配置案例8（OSPF NSSA）

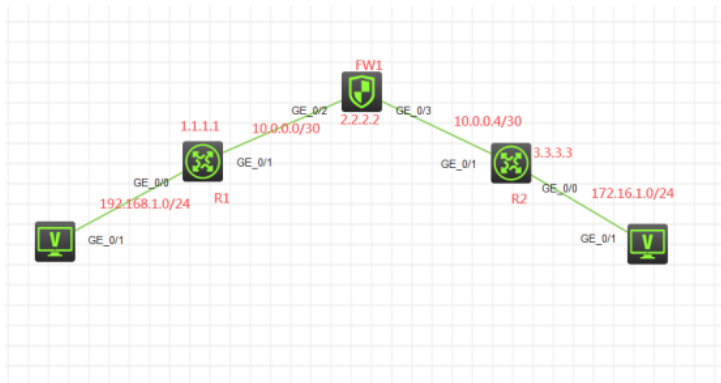
设备部署方式

H3C模拟器

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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OSPF路由协议实现互通。
- 4、R1、R2为NSSA最终末梢区域

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 0.0.0.1
[R1-ospf-1-area-0.0.0.1]nssa no-summary
[R1-ospf-1-area-0.0.0.1]network 10.0.0.1 0.0.0.0
[R1-ospf-1-area-0.0.0.1]network 1.1.1.1 0.0.0.0
[R1-ospf-1-area-0.0.0.1]network 192.168.1.0 0.0.0.255
[R1-ospf-1-area-0.0.0.1]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]nssa no-summary
[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]area 0.0.0.1
[FW1-ospf-1-area-0.0.0.1]network 10.0.0.2 0.0.0.0
[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]network 2.2.2.2 0.0.0.0
[FW1-ospf-1-area-0.0.0.1]nssa
[FW1-ospf-1-area-0.0.0.1]quit
```

测试：

PC都填写IP地址：

配置PC_4

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	192.168.1.2/24	

刷新

接口管理

☐ 禁用

☒ 启用

IPv4配置：

☐ DHCP

☒ 静态

IPv4地址：

192.168.1.2

掩码地址：

255.255.255.0

IPv4网关：

192.168.1.1

启用

配置PC_5

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	172.16.1.2/24	

刷新

接口管理

☐ 禁用

☒ 启用

IPv4配置：

☐ DHCP

☒ 静态

IPv4地址：

172.16.1.2

掩码地址：

255.255.255.0

IPv4网关：

172.16.1.1

启用

PC之间可以相互PING通：

```
h3c_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.
```

```
h3c_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>
<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: 0.0.0.1
Router ID      Address        Pri Dead-Time  State          Interface
2.2.2.2        10.0.0.2       1   34           Full/BDR       GE0/1
[R1]
```

```
[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
[R2]
```

```
[FW1]dis ospf peer

      OSPF Process 1 with Router ID 2.2.2.2
      Neighbor Brief Information

Area: 0.0.0.1
Router ID      Address        Pri Dead-Time  State          Interface
1.1.1.1        10.0.0.1       1   32           Full/DR        GE1/0/2
3.3.3.3        10.0.0.5       1   32           Full/DR        GE1/0/3
[FW1]
```

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_INTRA	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_INTRA	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_INTRA	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_INTRA	10	2	10.0.0.6	GE0/1
2.2.2.2/32	O_INTRA	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_INTRA	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_INTRA	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，F1060路由模式典型组网配置案例8（OSPF NSSA）已完成！