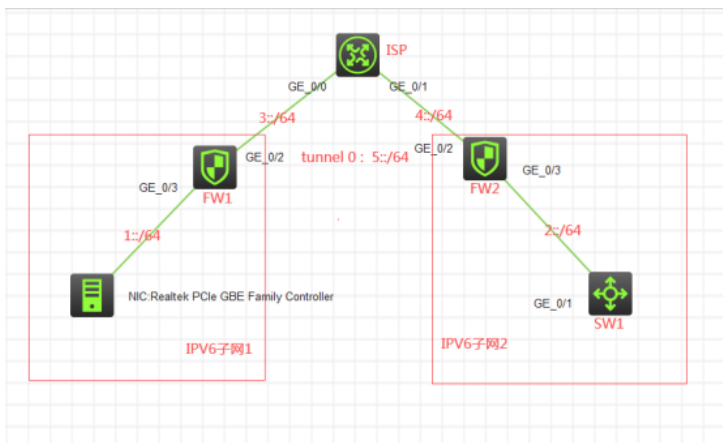


## 知 F1060 ipv6 over ipv6隧道典型组网配置案例

设备部署方式 H3C模拟器 韦家宁 2020-03-07 发表

### 组网及说明



### 组网说明:

本案例采用H3C HCL模拟器的F1060来模拟ipv6 over ipv6隧道的典型组网配置。IPV6子网在网络拓扑图已经有了明确的标识。为了避免IPV6子网1和IPV6子网2在整个IPV6子网中泄露并实现通信，因此在FW1与FW2之间建立ipv6 over ipv6的隧道。

### 配置步骤

- 1、按照网络拓扑图正确配置IP地址
- 2、FW1与FW2建立ipv6 over ipv6隧道

### 配置关键点

ISP:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname ISP
[ISP]int gi 0/0
[ISP-GigabitEthernet0/0]des <connect to FW1>
[ISP-GigabitEthernet0/0]ipv6 address 3::2 64
[ISP-GigabitEthernet0/0]quit
[ISP]int gi 0/1
[ISP-GigabitEthernet0/1]des <connect to FW2>
[ISP-GigabitEthernet0/1]ipv6 address 4::2 64
[ISP-GigabitEthernet0/1]quit
```

SW1:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname SW1
[SW1]int gi 1/0/1
[SW1-GigabitEthernet1/0/1]port link-mode route
[SW1-GigabitEthernet1/0/1]des <connect to FW2>
[SW1-GigabitEthernet1/0/1]ipv6 address 2::2 64
[SW1-GigabitEthernet1/0/1]quit
[SW1]ipv6 route-static :: 0 2::1
```

FW1:

```
<H3C>sys
System View: return to User View with Ctrl+Z.
[H3C]sysname FW1
```

```

[FW1]acl ipv6 basic 2001
[FW1-acl-ipv6-basic-2001]rule 0 permit source any
[FW1-acl-ipv6-basic-2001]quit
[FW1]
[FW1]zone-pair security source trust destination untrust
[FW1-zone-pair-security-Trust-Untrust]packet-filter ipv6 2001
[FW1-zone-pair-security-Trust-Untrust]quit
[FW1]
[FW1]zone-pair security source untrust destination trust
[FW1-zone-pair-security-Untrust-Trust]packet-filter ipv6 2001
[FW1-zone-pair-security-Untrust-Trust]quit
[FW1]
[FW1]zone-pair security source trust destination local
[FW1-zone-pair-security-Trust-Local]packet-filter ipv6 2001
[FW1-zone-pair-security-Trust-Local]quit
[FW1]
[FW1]zone-pair security source local destination trust
[FW1-zone-pair-security-Local-Trust]packet-filter ipv6 2001
[FW1-zone-pair-security-Local-Trust]quit
[FW1]
[FW1]zone-pair security source untrust destination local
[FW1-zone-pair-security-Untrust-Local]packet-filter ipv6 2001
[FW1-zone-pair-security-Untrust-Local]quit
[FW1]
[FW1]zone-pair security source local destination untrust
[FW1-zone-pair-security-Local-Untrust]packet-filter ipv6 2001
[FW1-zone-pair-security-Local-Untrust]quit
[FW1]
[FW1]zone-pair security source trust destination trust
[FW1-zone-pair-security-Trust-Trust]packet-filter ipv6 2001
[FW1-zone-pair-security-Trust-Trust]quit
[FW1]
[FW1]zone-pair security source untrust destination untrust
[FW1-zone-pair-security-Untrust-Untrust]packet-filter ipv6 2001
[FW1-zone-pair-security-Untrust-Untrust]quit
[FW1]int gi 1/0/3
[FW1-GigabitEthernet1/0/3]ipv6 address 1::1 64
[FW1-GigabitEthernet1/0/3]quit
[FW1]int gi 1/0/2
[FW1-GigabitEthernet1/0/2]des <connect to ISP>
[FW1-GigabitEthernet1/0/2]ipv6 address 3::1 64
[FW1-GigabitEthernet1/0/2]quit
[FW1]ipv6 route-static :: 0 3::2
[FW1]security-zone name Trust
[FW1-security-zone-Trust]import interface GigabitEthernet 1/0/3
[FW1-security-zone-Trust]quit
[FW1]security-zone name Untrust
[FW1-security-zone-Untrust]import interface GigabitEthernet 1/0/2
[FW1-security-zone-Untrust]quit

```

FW1 ipv6 over ipv6隧道配置关键点:

```

[FW1]int Tunnel 0 mode ipv6
[FW1-Tunnel0]ipv6 address 5::1 64
[FW1-Tunnel0]source 3::1
[FW1-Tunnel0]destination 4::1
[FW1-Tunnel0]quit
[FW1]ipv6 route-static 2:: 64 Tunnel 0
[FW1]security-zone name Untrust
[FW1-security-zone-Untrust]import interface Tunnel 0
[FW1-security-zone-Untrust]quit

```

FW2:

<H3C>sys

System View: return to User View with Ctrl+Z.

```

[H3C]sysname FW2
[FW2]acl ipv6 basic 2001
[FW2-acl-ipv6-basic-2001]rule 0 permit source any
[FW2-acl-ipv6-basic-2001]quit
[FW2]
[FW2]zone-pair security source trust destination untrust
[FW2-zone-pair-security-Trust-Untrust]packet-filter ipv6 2001
[FW2-zone-pair-security-Trust-Untrust]quit
[FW2]
[FW2]zone-pair security source untrust destination trust
[FW2-zone-pair-security-Untrust-Trust]packet-filter ipv6 2001
[FW2-zone-pair-security-Untrust-Trust]quit
[FW2]
[FW2]zone-pair security source trust destination local
[FW2-zone-pair-security-Trust-Local]packet-filter ipv6 2001
[FW2-zone-pair-security-Trust-Local]quit
[FW2]
[FW2]zone-pair security source local destination trust
[FW2-zone-pair-security-Local-Trust]packet-filter ipv6 2001
[FW2-zone-pair-security-Local-Trust]quit
[FW2]
[FW2]zone-pair security source untrust destination local
[FW2-zone-pair-security-Untrust-Local]packet-filter ipv6 2001
[FW2-zone-pair-security-Untrust-Local]quit
[FW2]
[FW2]zone-pair security source local destination untrust
[FW2-zone-pair-security-Local-Untrust]packet-filter ipv6 2001
[FW2-zone-pair-security-Local-Untrust]quit
[FW2]
[FW2]zone-pair security source trust destination trust
[FW2-zone-pair-security-Trust-Trust]packet-filter ipv6 2001
[FW2-zone-pair-security-Trust-Trust]quit
[FW2]
[FW2]zone-pair security source untrust destination untrust
[FW2-zone-pair-security-Untrust-Untrust]packet-filter ipv6 2001
[FW2-zone-pair-security-Untrust-Untrust]quit
[FW2]int gi 1/0/3
[FW2-GigabitEthernet1/0/3]ipv6 address 2::1 64
[FW2-GigabitEthernet1/0/3]quit
[FW2]int gi 1/0/2
[FW2-GigabitEthernet1/0/2]des <connect to ISP>
[FW2-GigabitEthernet1/0/2]ipv6 address 4::1 64
[FW2-GigabitEthernet1/0/2]quit
[FW2]ipv6 route-static :: 0 4::2
[FW2]security-zone name Trust
[FW2-security-zone-Trust]import interface GigabitEthernet 1/0/3
[FW2-security-zone-Trust]quit
[FW2]security-zone name Untrust
[FW2-security-zone-Untrust]import interface GigabitEthernet 1/0/2
[FW2-security-zone-Untrust]quit

```

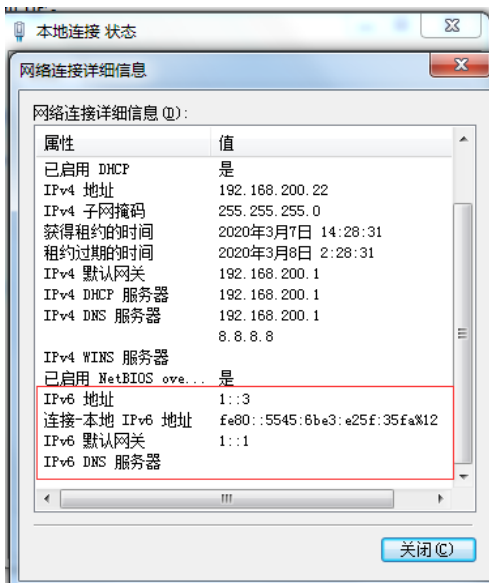
FW2 ipv6 over ipv6隧道配置关键点:

```

[FW2]int Tunnel 0 mode ipv6
[FW2-Tunnel0]ipv6 address 5::2 64
[FW2-Tunnel0]source 4::1
[FW2-Tunnel0]destination 3::1
[FW2-Tunnel0]quit
[FW2]ipv6 route-static 1:: 64 Tunnel 0
[FW2]security-zone name Untrust
[FW2-security-zone-Untrust]import interface Tunnel 0
[FW2-security-zone-Untrust]quit

```

IPV6子网1的PC填写IPV6地址:



IPv6子网1的PC可以PING通IPv6子网2的SW1, PING不通ISP的IPv6地址:

```

管理员: C:\Windows\system32\cmd.exe
Microsoft Windows [版本 6.1.7601]
版权所有 (c) 2009 Microsoft Corporation。保留所有权利。

C:\Users\Administrator.USER-20190510MA>ping 2::2

正在 Ping 2::2 具有 32 字节的数据:
来自 2::2 的回复: 时间=3ms
来自 2::2 的回复: 时间=2ms
来自 2::2 的回复: 时间=2ms
来自 2::2 的回复: 时间=2ms

2::2 的 Ping 统计信息:
    数据包: 已发送 = 4, 已接收 = 4, 丢失 = 0 (0% 丢失),
    往返行程的估计时间(以毫秒为单位):
        最短 = 2ms, 最长 = 3ms, 平均 = 2ms

C:\Users\Administrator.USER-20190510MA>ping 4::2

正在 Ping 4::2 具有 32 字节的数据:
请求超时。
请求超时。
请求超时。
请求超时。

4::2 的 Ping 统计信息:

```

IPv6子网2的SW1可以PING通IPv6子网1的PC, PING不通ISP的IPv6地址:

```

hcl_ispnzh
MSK36-20_3 F1060_1 F1060_2 SSR00V2-54QS-GR_4

<SW1>
<SW1>ping ipv6 1::3
Ping6(56 data bytes) 2::2 --> 1::3, press CTRL_C to break
56 bytes from 1::3, icmp_seq=0 hlim=126 time=5.000 ms
56 bytes from 1::3, icmp_seq=1 hlim=126 time=4.000 ms
56 bytes from 1::3, icmp_seq=2 hlim=126 time=3.000 ms
56 bytes from 1::3, icmp_seq=3 hlim=126 time=3.000 ms
56 bytes from 1::3, icmp_seq=4 hlim=126 time=3.000 ms

--- Ping6 statistics for 1::3 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 3.000/3.600/5.000/0.800 ms
<SW1>Mar  7 18:47:29:807 2020 SW1 PING/6/PING_STATISTICS: Ping6 statistics for 1::3: 5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss, round-trip min/avg/max/std-dev = 3.000/3.600/5.000/0.800 ms.

<SW1>ping ipv6 3::2
Ping6(56 data bytes) 2::2 --> 3::2, press CTRL_C to break
Request time out
Request time out
Request time out
Request time out
Request time out

```

根据测试结果得知, IPv6子网1和IPv6子网2已经在ISP中成功隐藏, 并实现互通。

分别查看FW1和FW2的隧道状态:

```

[FW1]dis ipv6 interface Tunnel brief
*down: administratively down
(s): spoofing
Interface          Physical Protocol IPv6 Address
Tunnel0            up        up        5::1
[FW1]

```

```
[FW2]dis ipv6 int Tunnel brief
*down: administratively down
(s): spoofing
Interface          Physical Protocol IPv6 Address
Tunnel0           up          up          5::2
[FW2]
```

分别查看FW1和FW2的IPv6路由表, 均可看到隧道的路由:

[FW1]dis ipv6 routing-table

Destinations : 11    Routes : 11

```
Destination: ::0                Protocol : Static
NextHop   : 3::2                Preference: 60
Interface : GE1/0/2              Cost      : 0

Destination: ::1/128            Protocol : Direct
NextHop   : ::1                 Preference: 0
Interface : InLoop0              Cost      : 0

Destination: 1::/64             Protocol : Direct
NextHop   : ::                  Preference: 0
Interface : GE1/0/3              Cost      : 0

Destination: 1::1/128           Protocol : Direct
NextHop   : ::1                 Preference: 0
Interface : InLoop0              Cost      : 0

Destination: 2::/64             Protocol : Static
NextHop   : ::                  Preference: 60
Interface : Tun0                  Cost      : 0

Destination: 3::/64             Protocol : Direct
NextHop   : ::                  Preference: 0
Interface : GE1/0/2              Cost      : 0

Destination: 3::1/128           Protocol : Direct
NextHop   : ::1                 Preference: 0
Interface : InLoop0              Cost      : 0

Destination: 5::/64             Protocol : Direct
NextHop   : ::                  Preference: 0
Interface : Tun0                  Cost      : 0

Destination: 5::1/128           Protocol : Direct
NextHop   : ::1                 Preference: 0
Interface : InLoop0              Cost      : 0

Destination: FE80::/10          Protocol : Direct
NextHop   : ::                  Preference: 0
Interface : InLoop0              Cost      : 0

Destination: FF00::/8           Protocol : Direct
NextHop   : ::                  Preference: 0
Interface : NULL0                 Cost      : 0
[FW1]
```

[FW2]dis ipv6 routing-table

Destinations : 11    Routes : 11

```
Destination: ::0                Protocol : Static
NextHop   : 4::2                Preference: 60
Interface : GE1/0/2              Cost      : 0

Destination: ::1/128            Protocol : Direct
```

```

NextHop  ::1                Preference: 0
Interface : InLoop0         Cost      : 0

Destination: 1::/64         Protocol : Static
NextHop   ::                Preference: 60
Interface : Tun0            Cost      : 0

Destination: 2::/64         Protocol : Direct
NextHop   ::                Preference: 0
Interface : GE1/0/3         Cost      : 0

Destination: 2::1/128       Protocol : Direct
NextHop   ::1               Preference: 0
Interface : InLoop0         Cost      : 0

Destination: 4::/64         Protocol : Direct
NextHop   ::                Preference: 0
Interface : GE1/0/2         Cost      : 0

Destination: 4::1/128       Protocol : Direct
NextHop   ::1               Preference: 0
Interface : InLoop0         Cost      : 0

Destination: 5::/64         Protocol : Direct
NextHop   ::                Preference: 0
Interface : Tun0            Cost      : 0

Destination: 5::2/128       Protocol : Direct
NextHop   ::1               Preference: 0
Interface : InLoop0         Cost      : 0

Destination: FE80::/10      Protocol : Direct
NextHop   ::                Preference: 0
Interface : InLoop0         Cost      : 0

Destination: FF00::/8       Protocol : Direct
NextHop   ::                Preference: 0
Interface : NULL0           Cost      : 0
[FW2]

```

至此，F1060 ipv6 over ipv6隧道典型组网配置案例已完成！