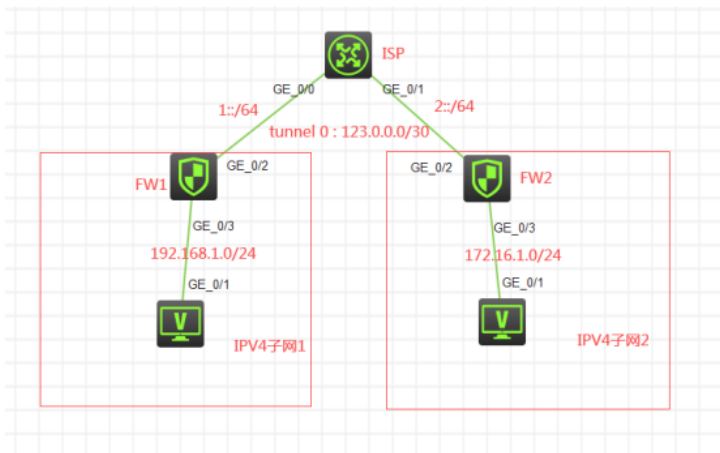# F1060 IPV4 OVER IPV6隧道典型组网配置案例

设备部署方式   GRE VPN   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防火墙来模拟ipv4 over ipv6隧道的典型组网配置。IPV4子网和IPV6子网在网络拓扑图中已经有了明确的标识。要求IPV4子网能够穿越IPV6子网实现互通，因此需要在FW1与FW2之间建立ipv4 over ipv6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ipv4 over ipv6隧道

特别说明：
由于本案例承载了IPV4子网及IPV6子网，因此需要在FW1、FW2的域间策略中放通IPV4及IPV6的安全策略。

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 1::2 64
[ISP-GigabitEthernet0/0]quit
[ISP]int gi 0/1
[ISP-GigabitEthernet0/1]des <connect to FW2>
[ISP-GigabitEthernet0/1]ipv6 address 2::2 64
[ISP-GigabitEthernet0/1]quit

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]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 ipv6 2001
[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 ipv6 2001
[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 ipv6 2001
[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 ipv6 2001
[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 ipv6 2001
[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 ipv6 2001
[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 ipv6 2001
[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 ipv6 2001
[FW1-zone-pair-security-Untrust-Untrust]packet-filter 2002
[FW1-zone-pair-security-Untrust-Untrust]quit
[FW1]int gi 1/0/3
[FW1-GigabitEthernet1/0/3]ip address 192.168.1.1 24
[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 1::1 64
[FW1-GigabitEthernet1/0/2]quit
[FW1]ipv6 route-static :: 0 1::2
[FW1]security-zone name Untrust
[FW1-security-zone-Untrust]import interface GigabitEthernet 1/0/2
[FW1-security-zone-Untrust]quit
[FW1]security-zone name Trust
[FW1-security-zone-Trust]import interface GigabitEthernet 1/0/3
[FW1-security-zone-Trust]quit
```

FW1 ipv4 over ipv6隧道配置关键点：
```
[FW1]int Tunnel 0 mode ipv6
[FW1-Tunnel0]ip address 123.0.0.1 30
[FW1-Tunnel0]source 1::1
[FW1-Tunnel0]destination 2::1
[FW1-Tunnel0]quit
[FW1]ip route-static 172.16.1.0 255.255.255.0 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]acl basic 2002

[FW2-acl-ipv4-basic-2002]rule 0 permit source any

[FW2-acl-ipv4-basic-2002]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]packet-filter 2002

[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]packet-filter 2002

[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]packet-filter 2002

[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]packet-filter 2002

[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]packet-filter 2002

[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]packet-filter 2002

[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]packet-filter 2002

[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]packet-filter 2002

[FW2-zone-pair-security-Untrust-Untrust]quit

[FW2]int gi 1/0/3

[FW2-GigabitEthernet1/0/3]ip address 172.16.1.1 24

[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 2::1 64

[FW2-GigabitEthernet1/0/2]quit

[FW2]ipv6 route-static :: 0 2::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
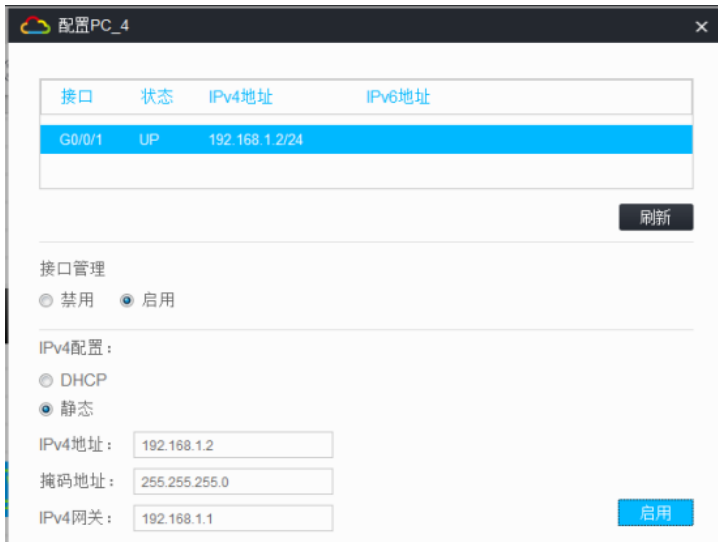
[FW2-security-zone-Untrust]quit

FW2 ipv4 over ipv6隧道关键配置点:

[FW2]int Tunnel 0 mode ipv6
[FW2-Tunnel0]ip address 123.0.0.2 30
[FW2-Tunnel0]source 2::1
[FW2-Tunnel0]destination 1::1
[FW2-Tunnel0]quit
[FW2]ip route-static 192.168.1.0 255.255.255.0 123.0.0.1
[FW2]security-zone name Untrust
[FW2-security-zone-Untrust]import interface Tunnel 0
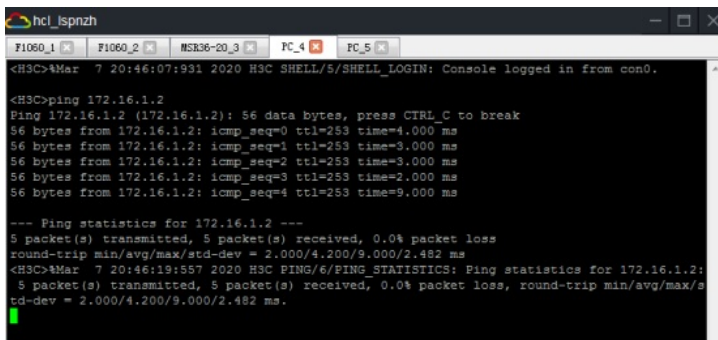[FW2-security-zone-Untrust]quit

测试：
所有PC都填写IP地址：

IPV4子网1的PC可以PING通IPV4子网2的PC：

IPV4子网2的PC可以PING通IPV4子网1的PC：

根据测试结果得知，IPV4子网1和IPV4子网2均可穿越IPV6子网实现互通。

分别查看FW1、FW2的隧道状态及信息：

```
[FW1]dis int Tunnel 0 brief
Brief information on interfaces in route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface          Link Protocol Primary IP    Description
Tun0               UP   UP        123.0.0.1
[FW1]
```

```
[FW2]dis int Tunnel 0 brief
Brief information on interfaces in route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface          Link Protocol Primary IP    Description
Tun0               UP   UP        123.0.0.2
[FW2]
```

分别查看FW1、FW2的路由表，均可看到隧道的路由：

```
[FW1]dis ip routing-table

Destinations : 17      Routes : 17

Destination/Mask      Proto  Pre Cost    NextHop        Interface
0.0.0.0/32            Direct 0   0       127.0.0.1      InLoop0
123.0.0.0/30         Direct 0   0       123.0.0.1      Tun0
123.0.0.0/32         Direct 0   0       123.0.0.1      Tun0
123.0.0.1/32         Direct 0   0       127.0.0.1      InLoop0
123.0.0.3/32         Direct 0   0       123.0.0.1      Tun0
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        Static 60  0       0.0.0.0        Tun0
192.168.1.0/24       Direct 0   0       192.168.1.1    GE1/0/3
192.168.1.0/32       Direct 0   0       192.168.1.1    GE1/0/3
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    GE1/0/3
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]
```

```
[FW2]dis ip routing-table

Destinations : 17      Routes : 17

Destination/Mask      Proto  Pre Cost    NextHop        Interface
0.0.0.0/32            Direct 0   0       127.0.0.1      InLoop0
123.0.0.0/30         Direct 0   0       123.0.0.2      Tun0
123.0.0.0/32         Direct 0   0       123.0.0.2      Tun0
123.0.0.2/32         Direct 0   0       127.0.0.1      InLoop0
123.0.0.3/32         Direct 0   0       123.0.0.2      Tun0
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     GE1/0/3
172.16.1.0/32        Direct 0   0       172.16.1.1     GE1/0/3
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     GE1/0/3
192.168.1.0/24       Static 60  0       123.0.0.1      Tun0
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
[FW2]
```

至此，F1060 ipv4 over ipv6隧道典型组网配置案例已完成！