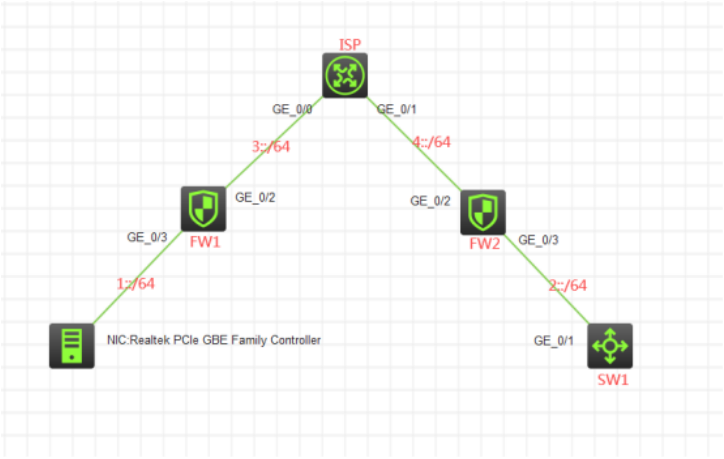
F1060 IPV6 IPSEC+IKE预共享密钥典型组网配置案例

IPSec VPN 设备部署方式 H3C模拟器 **韦家宁** 2020-03-08 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 IPSEC+IKE预共享密钥的典型组网配置。为了保障1::/64与2::/64之间传输数据的安全性，因此需要在FW1与FW2之间建立IPSEC VPN隧道，由于FW1与FW2都有着固定的IP地址，因此采用IPSEC+IKE预共享密钥的方式来进行组网。

配置步骤

1、按照网络拓扑图正确配置IP地址

2、FW1、FW2、ISP之间通过默认路由器及静态路由相互指向

3、FW1与FW2之间采用IPSEC+IKE预共享密钥的方式建立VPN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
[ISP]ipv6 route-static 1:: 64 3::1
[ISP]ipv6 route-static 2:: 64 4::1
```

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]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 IPSEC+IKE预共享密钥关键配置点：
[FW1]acl ipv6 advanced 3000
[FW1-acl-ipv6-adv-3000]rule 0 permit ipv6 source 1:: 64 destination 2:: 64
[FW1-acl-ipv6-adv-3000]quit
[FW1]ike keychain james
[FW1-ike-keychain-james]pre-shared-key address ipv6 4::1 64 key simple james
[FW1-ike-keychain-james]quit
[FW1]ike proposal 1
[FW1-ike-proposal-1]quit
[FW1]ike profile james
[FW1-ike-profile-james]keychain james
[FW1-ike-profile-james]proposal 1
[FW1-ike-profile-james]match remote identity address ipv6 4::1 64
[FW1-ike-profile-james]quit
[FW1]ipsec transform-set james
[FW1-ipsec-transform-set-james]protocol esp

```
[FW1-ipsec-transform-set-james]encapsulation-mode tunnel
[FW1-ipsec-transform-set-james]esp authentication-algorithm md5
[FW1-ipsec-transform-set-james]esp encryption-algorithm des-cbc
[FW1-ipsec-transform-set-james]quit
[FW1]ipsec ipv6-policy james 1 isakmp
[FW1-ipsec-ipv6-policy-isakmp-james-1]security acl ipv6 3000
[FW1-ipsec-ipv6-policy-isakmp-james-1]transform-set james
[FW1-ipsec-ipv6-policy-isakmp-james-1]ike-profile james
[FW1-ipsec-ipv6-policy-isakmp-james-1]remote-address ipv6 4::1
[FW1-ipsec-ipv6-policy-isakmp-james-1]quit
[FW1]int gi 1/0/2
[FW1-GigabitEthernet1/0/2]ipsec apply ipv6-policy james
[FW1-GigabitEthernet1/0/2]quit
```

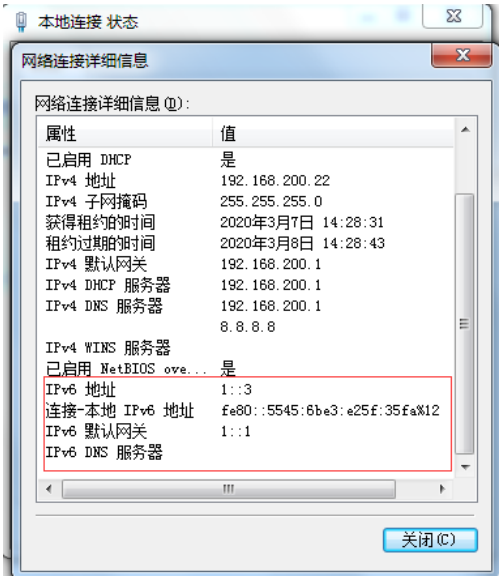
FW2：

```
<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]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]des <connect to SW1>
[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 Untrust
[FW2-security-zone-Untrust]import interface GigabitEthernet 1/0/2
[FW2-security-zone-Untrust]quit
```

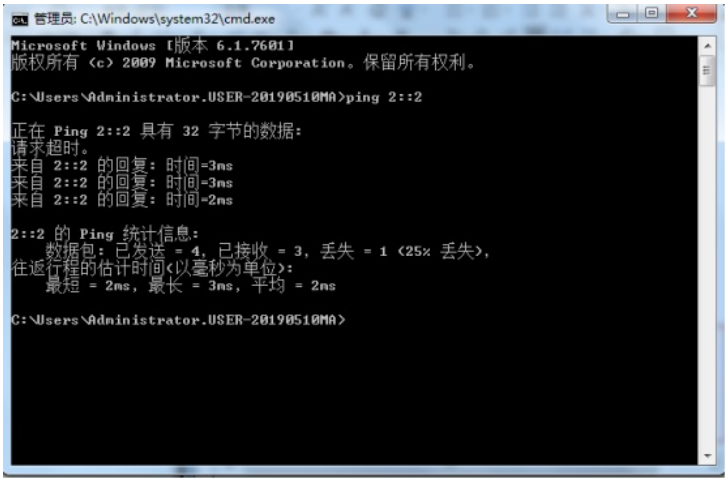
[FW2]security-zone name Trust
[FW2-security-zone-Trust]import interface GigabitEthernet 1/0/3
[FW2-security-zone-Trust]quit

FW2 IPV6 IPSEC+IKE预共享密钥关键配置点：
[FW2]acl ipv6 advanced 3000
[FW2-acl-ipv6-adv-3000]rule 0 permit ipv6 source 2:: 64 destination 1:: 64
[FW2-acl-ipv6-adv-3000]quit
[FW2]ike keychain james
[FW2-ike-keychain-james]pre-shared-key address ipv6 3::1 64 key simple james
[FW2-ike-keychain-james]quit
[FW2]ike proposal 1
[FW2-ike-proposal-1]quit
[FW2]ike profile james
[FW2-ike-profile-james]keychain james
[FW2-ike-profile-james]proposal 1
[FW2-ike-profile-james]match remote identity address ipv6 3::1 64
[FW2-ike-profile-james]quit
[FW2]ipsec transform-set james
[FW2-ipsec-transform-set-james]protocol esp
[FW2-ipsec-transform-set-james]encapsulation-mode tunnel
[FW2-ipsec-transform-set-james]esp authentication-algorithm md5
[FW2-ipsec-transform-set-james]esp encryption-algorithm des-cbc
[FW2-ipsec-transform-set-james]quit
[FW2]ipsec ipv6-policy james 1 isakmp
[FW2-ipsec-ipv6-policy-isakmp-james-1]security acl ipv6 3000
[FW2-ipsec-ipv6-policy-isakmp-james-1]transform-set james
[FW2-ipsec-ipv6-policy-isakmp-james-1]ike-profile james
[FW2-ipsec-ipv6-policy-isakmp-james-1]remote-address ipv6 3::1
[FW2-ipsec-ipv6-policy-isakmp-james-1]quit
[FW2]int gi 1/0/2
[FW2-GigabitEthernet1/0/2]ipsec apply ipv6-policy james
[FW2-GigabitEthernet1/0/2]quit

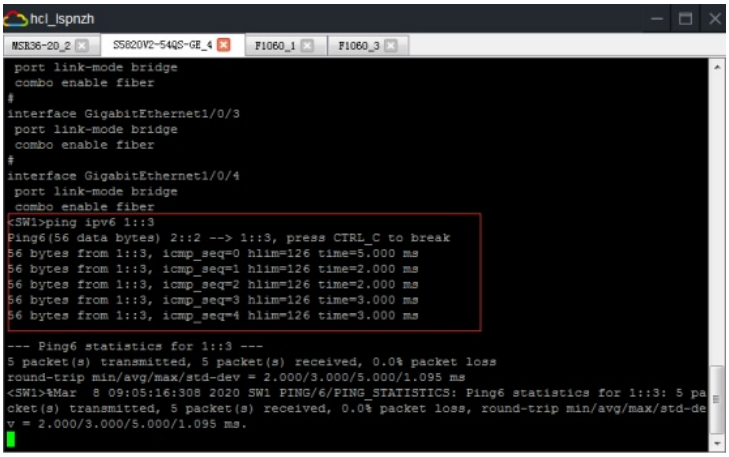
测试：
物理机填写IPV6地址：



物理机能PING通SW1：



SW1能PING通物理机：



查看FW1的IPSEC显示信息：

```
[FW1]dis ipsec ipv6-policy
----------------------------------------
IPsec Policy: james
Interface: GigabitEthernet1/0/2
----------------------------------------

  ----------------------------
  Sequence number: 1
  Mode: ISAKMP
  ----------------------------
  Traffic Flow Confidentiality: Disabled
  Security data flow: 3000
  Selector mode: standard
  Local address:
  Remote address: 4::1
  Transform set:  james
  IKE profile: james
  IKEv2 profile:
  smart-link policy:
  SA trigger mode: Traffic-based
  SA duration(time based): 3600 seconds
  SA duration(traffic based): 1843200 kilobytes
  SA soft-duration buffer(time based): --
  SA soft-duration buffer(traffic based): --
  SA idle time: --
[FW1]
```

```
[FW1]dis ipsec transform-set
IPsec transform set: james
  State: complete
  Encapsulation mode: tunnel
  ESN: Disabled
  PFS:
  Transform: ESP
  ESP protocol:
    Integrity: MD5
    Encryption: DES-CBC

[FW1]
```

```
[FW1]dis ipsec tunnel
Tunnel ID: 0
Status: Active
Perfect forward secrecy:
Inside vpn-instance:
SA's SPI:
    outbound:  4250926382  (0xfd5ffd2e)   [ESP]
    inbound:   875399137   (0x342d87e1)   [ESP]
Tunnel:
    local  address: 3::1
    remote address: 4::1
Flow:
    sour addr: 1::/64  port: 0  protocol: ipv6
    dest addr: 2::/64  port: 0  protocol: ipv6
[FW1]
```

```
[FW1]dis ipsec tunnel brief
------------------------------------------------------------------------------
Tunn-id   Src Address     Dst Address     Inbound SPI   Outbound SPI  Status
------------------------------------------------------------------------------
0         3::1            4::1            875399137     4250926382    Active
[FW1]
```

```
[FW1]dis ike sa
    Connection-ID   Remote                Flag         DOI
-----------------------------------------------------------------
    1               4::1                 RD           IPsec
Flags:
RD--READY RL--REPLACED FD-FADING RK-REKEY
[FW1]
```

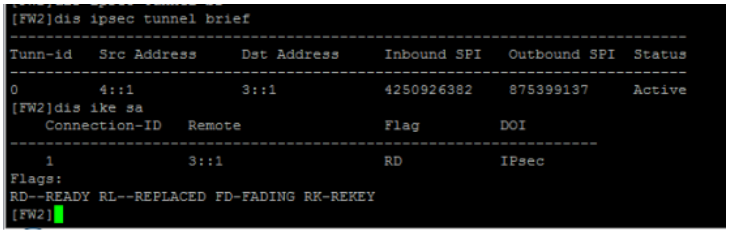
查看FW2的IPSEC显示信息：

```
[FW2]dis ipsec ipv6-policy
-------------------------------------------
IPsec Policy: james
Interface: GigabitEthernet1/0/2
-------------------------------------------

  ----------------------------
  Sequence number: 1
  Mode: ISAKMP
  ----------------------------
  Traffic Flow Confidentiality: Disabled
  Security data flow: 3000
  Selector mode: standard
  Local address:
  Remote address: 3::1
  Transform set:  james
  IKE profile: james
  IKEv2 profile:
  smart-link policy:
  SA trigger mode: Traffic-based
  SA duration(time based): 3600 seconds
  SA duration(traffic based): 1843200 kilobytes
  SA soft-duration buffer(time based): --
  SA soft-duration buffer(traffic based): --
  SA idle time: --
[FW2]
```

```
[FW2]dis ipsec tunnel
Tunnel ID: 0
Status: Active
Perfect forward secrecy:
Inside vpn-instance:
SA's SPI:
    outbound:  875399137   (0x342d87e1)   [ESP]
    inbound:   4250926382  (0xfd5ffd2e)   [ESP]
Tunnel:
    local  address: 4::1
    remote address: 3::1
Flow:
    sour addr: 2::/64  port: 0  protocol: ipv6
    dest addr: 1::/64  port: 0  protocol: ipv6
[FW2]
```

```
[FW2]dis ipsec tunnel brief
------------------------------------------------------------------------------
Tunn-id   Src Address     Dst Address     Inbound SPI   Outbound SPI  Status
------------------------------------------------------------------------------
0         4::1            3::1            4250926382    875399137     Active
[FW2]
```



至此，F1060 IPV6 IPSEC+IKE预共享密钥已完成！