F5000-X系列V7防火墙使用IKEV2主模式建立IPSEC VPN典型配置

IPSec VPN　zhiliao_FO3qD　2018-11-25 发表

组网及说明

1 配置需求及说明

1.1 适用的产品系列

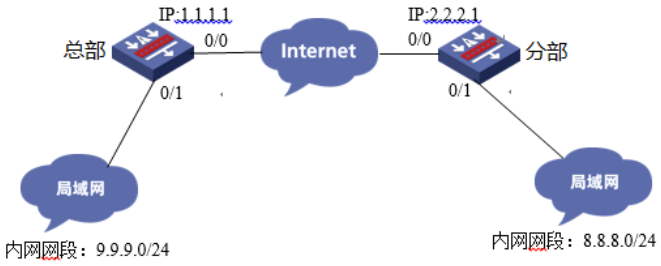
本案例适用于如F5080、F5060、F5030、F5000-M等F5000、F5000-X系列的防火墙。

1.2 配置需求及实现的效果

用户需求两台V7防火墙使用IKEV2协议对接IPSEC VPN，IP地址及接口规划如下表所示：

公司名称	外网接口	公网地址/掩码	公网网关	内网接口	内网地址/掩码
总部	0/0	1.1.1.1/24	1.1.1.2	0/1	9.9.9.0/24
分部	0/0	2.2.2.1/24	2.2.2.2	0/1	8.8.8.0/24

2 组网图



配置步骤

3 配置步骤

3.1 两端防火墙上网配置

防火墙上网配置请参考“2.3.2 防火墙外网使用固定IP地址上网配置方法”进行配置，本文只针对IPSEC VPN配置进行介绍。

3.2 总部侧创建IPSEC兴趣流匹配到分部的数据

创建IPSEC的感兴趣流，用于匹配IPSEC数据。

```
<H3C>system
[H3C]acl advanced 3000
[H3C-acl-ipv4-adv-3000]rule permit ip source 9.9.9.0 0.0.0.255 destination 8.8.8.0 0.0.0.255
[H3C-acl-ipv4-adv-3000]quit
```

创建acl 3001调用在外网接口用于排除IPSEC兴趣流不做NAT。

```
[H3C]acl advanced 3001
[H3C-acl-ipv4-adv-3001]rule deny ip source 9.9.9.0 0.0.0.255 destination 8.8.8.0 0.0.0.255
[H3C-acl-ipv4-adv-3001]rule permit ip source any
[H3C-acl-ipv4-adv-3001]quit
```

3.3 总部侧创建IPSEC安全提议

加密类型设置为3des-cbc，认证类型设置为md5。

```
[H3C]ipsec transform-set 1
[H3C-ipsec-transform-set-1] esp encryption-algorithm 3des-cbc
[H3C-ipsec-transform-set-1] esp authentication-algorithm md5
[H3C-ipsec-transform-set-1] quit
```

3.4 总部侧创建IKEV2安全提议

设备存在默认的IKE V2安全提议,所以不需要配置也存在参数。

```
[H3C]ikev2 proposal 1
[H3C-ikev2-proposal-1]quit
```

以下为IKE V2默认的加密及认证算法。

```
<H3C>display ikev2 proposal
IKEv2 proposal : default
  Encryption: AES-CBC-128 3DES-CBC
  Integrity: SHA1 MD5
  PRF: SHA1 MD5
```

DH Group: MODP1536/Group5 MODP1024/Group2

3.5 总部侧创建IKE V2安全密钥

创建IKE V2密钥，地址填写分部侧设备的公网IP，密码设置为123。

[H3C]ike keychain 1
[H3C-ike-keychain-1-peer2]peer 2
[H3C-ike-keychain-1-peer2] address 2.2.2.1 255.255.255.255
[H3C-ike-keychain-1-peer2] identity address 2.2.2.1
[H3C-ike-keychain-1-peer2] pre-shared-key plaintext 123
[H3C-ike-keychain-1-peer2]quit

3.6 总部侧创建IKE安全框架

创建IKE安全框架，将对端地址、keychain、proposal关联起来。

[H3C]ikev2 profile 1
[H3C-ikev2-profile-1]keychain 1
[H3C-ikev2-profile-1] authentication-method local pre-share
[H3C-ikev2-profile-1] authentication-method remote pre-share
[H3C-ikev2-profile-1] match remote identity address 2.2.2.1 255.255.255.255
[H3C-ikev2-profile-1]quit

3.7 总部侧创建IPSEC安全策略

创建IKE安全策略GE0/0将transform-set、acl、ikev2-profile、对端地址关联起来。

[H3C]ipsec policy GE0/0 1 isakmp
[H3C-ipsec-policy-isakmp- GE0/0-1]transform-set 1
[H3C-ipsec-policy-isakmp- GE0/0-1]security acl 3000
[H3C-ipsec-policy-isakmp- GE0/0-1]remote-address 2.2.2.1
[H3C-ipsec-policy-isakmp- GE0/0-1]ikev2-profile 1
[H3C-ipsec-policy-isakmp- GE0/0-1]quit

3.8 总部侧在外网接口调用NAT及IPSEC策略

[H3C]interface GigabitEthernet 0/0
[H3C-GigabitEthernet 0/0]ipsec apply policy GE0/0
[H3C-GigabitEthernet 0/0]nat outbound 3001
[H3C-GigabitEthernet 0/0]quit

3.9 分部侧创建IPSEC兴趣流匹配到分部的数据

创建IPSEC的感兴趣流，用于匹配IPSEC数据。

<H3C>system
[H3C]acl advanced 3000
[H3C-acl-ipv4-adv-3000]rule permit ip source 8.8.8.0 0.0.0.255 destination 9.9.9.0 0.0.0.255
[H3C-acl-ipv4-adv-3000]quit

创建acl 3001调用在外网接口用于排除IPSEC兴趣流不做NAT。

[H3C]acl advanced 3001
[H3C-acl-ipv4-adv-3001]rule deny ip source 8.8.8.0 0.0.0.255 destination 9.9.9.0 0.0.0.255
[H3C-acl-ipv4-adv-3001]rule permit ip source any
[H3C-acl-ipv4-adv-3001]quit

3.10 分部侧创建IPSEC安全提议

加密类型设置为3des-cbc，认证类型设置为md5。

[H3C]ipsec transform-set 1
[H3C-ipsec-transform-set-1] esp encryption-algorithm 3des-cbc
[H3C-ipsec-transform-set-1] esp authentication-algorithm md5
[H3C-ipsec-transform-set-1] quit

3.11 分部侧创建IKEV2安全提议

设备存在默认的IKE V2安全提议,所以不需要配置也存在参数。

[H3C]ikev2 proposal 1
[H3C-ikev2-proposal-1]quit

以下为IKE V2默认的加密及认证算法。

<H3C>display ikev2 proposal
IKEv2 proposal : default
  Encryption: AES-CBC-128 3DES-CBC
  Integrity: SHA1 MD5
  PRF: SHA1 MD5

DH Group: MODP1536/Group5 MODP1024/Group2

3.12 分部侧创建IKE V2安全密钥

创建IKE V2密钥，地址填写分部侧设备的公网IP，密码设置为123。

[H3C]ike keychain 1
[H3C-ike-keychain-1-peer1]peer 1
[H3C-ike-keychain-1-peer1] address 1.1.1.1 255.255.255.255
[H3C-ike-keychain-1-peer1] identity address 1.1.1.1
[H3C-ike-keychain-1-peer1] pre-shared-key plaintext 123
[H3C-ike-keychain-1-peer1]quit

3.13 分部侧创建IKE安全框架

创建IKE安全框架，将本端地址、对端地址、keychain、proposal关联起来。

[H3C]ikev2 profile 1
[H3C-ikev2-profile-1]keychain 1
[H3C-ikev2-profile-1] authentication-method local pre-share
[H3C-ikev2-profile-1] authentication-method remote pre-share
[H3C-ikev2-profile-1] match remote identity address 1.1.1.1 255.255.255.255
[H3C-ikev2-profile-1]quit

3.14 分部创建IPSEC安全策略

创建IKE安全策略GE0/0将transform-set、acl、ikev2-profile、对端地址关联起来。

[H3C]ipsec policy GE0/0 1 isakmp
[H3C-ipsec-policy-isakmp- GE0/0-1]transform-set 1
[H3C-ipsec-policy-isakmp- GE0/0-1]security acl 3000
[H3C-ipsec-policy-isakmp- GE0/0-1]remote-address 1.1.1.1
[H3C-ipsec-policy-isakmp- GE0/0-1]ikev2-profile 1
[H3C-ipsec-policy-isakmp- GE0/0-1]quit

3.15 分部侧在外网接口调用NAT及IPSEC策略

[H3C]interface GigabitEthernet 0/0
[H3C-GigabitEthernet 0/0]ipsec apply policy GE0/0
[H3C-GigabitEthernet 0/0]nat outbound 3001
[H3C-GigabitEthernet 0/0]quit

3.16 保存配置

[H3C]quit
<H3C>save force

3.17 隧道验证

通过如下显示信息查看到总部上IKEv2协商成功后生成的IKEv2 SA。

[H3C] display ikev2 sa
Tunnel ID Local Remote Status
---
1 1.1.1.1/500 2.2.2.1/500 EST

通过命令行查看dis ipsec sa可以看到隧道状态已经建立完成。

<H3C>dis ipsec sa

Interface: GigabitEthernet0/0

IPsec policy: 1
Sequence number: 1
Mode: ISAKMP

Tunnel id: 0
Encapsulation mode: tunnel
Perfect Forward Secrecy:
Inside VPN:
Extended Sequence Numbers enable: N
Traffic Flow Confidentiality enable: N
Path MTU: 1444
Tunnel:

```
    local  address: 1.1.1.1
    remote address: 2.2.2.1
  Flow:
    sour addr: 9.9.9.9/255.255.255.255  port: 0  protocol: ip
    dest addr: 8.8.8.8/255.255.255.255  port: 0  protocol: ip

  [Inbound ESP SAs]
    SPI: 2831964167 (0xa8cc5807)
    Connection ID: 12884901889
    Transform set: ESP-ENCRYPT-3DES-CBC ESP-AUTH-MD5
    SA duration (kilobytes/sec): 1843200/3600
    SA remaining duration (kilobytes/sec): 1843199/1475
    Max received sequence-number: 4
    Anti-replay check enable: Y
    Anti-replay window size: 64
    UDP encapsulation used for NAT traversal: N
    Status: Active

  [Outbound ESP SAs]
    SPI: 662015886 (0x27758f8e)
    Connection ID: 55834574848
    Transform set: ESP-ENCRYPT-3DES-CBC ESP-AUTH-MD5
    SA duration (kilobytes/sec): 1843200/3600
    SA remaining duration (kilobytes/sec): 1843199/1475
    Max sent sequence-number: 4
    UDP encapsulation used for NAT traversal: N
    Status: Active
```

通过如下显示信息查看到分部上IKEv2协商成功后生成的IKEv2 SA。

```
[H3C] display ikev2 sa
Tunnel ID    Local                Remote                   Status
-----------------------------------------------------------------
1   2.2.2.1/500             1.1.1.1/500                EST
```

通过命令行查看dis ipsec sa可以看到隧道状态已经建立完成。

```
<H3C>dis ipse sa
-------------------------------
Interface: GigabitEthernet0/0
-------------------------------

 ------------------------------
 IPsec policy: 1
 Sequence number: 1
 Mode: ISAKMP
 ------------------------------
  Tunnel id: 0
  Encapsulation mode: tunnel
  Perfect Forward Secrecy:
  Inside VPN:
  Extended Sequence Numbers enable: N
  Traffic Flow Confidentiality enable: N
  Path MTU: 1444
  Tunnel:
    local  address: 2.2.2.1
    remote address: 1.1.1.1
  Flow:
    sour addr: 8.8.8.8/255.255.255.255  port: 0  protocol: ip
    dest addr: 9.9.9.9/255.255.255.255  port: 0  protocol: ip

  [Inbound ESP SAs]
    SPI: 662015886 (0x27758f8e)
    Connection ID: 12884901889
    Transform set: ESP-ENCRYPT-3DES-CBC ESP-AUTH-MD5
    SA duration (kilobytes/sec): 1843200/3600
    SA remaining duration (kilobytes/sec): 1843199/1431
    Max received sequence-number: 4
```

Anti-replay check enable: Y
Anti-replay window size: 64
UDP encapsulation used for NAT traversal: N
Status: Active

[Outbound ESP SAs]
SPI: 2831964167 (0xa8cc5807)
Connection ID: 12884901888
Transform set: ESP-ENCRYPT-3DES-CBC ESP-AUTH-MD5
SA duration (kilobytes/sec): 1843200/3600
SA remaining duration (kilobytes/sec): 1843199/1431
Max sent sequence-number: 4
UDP encapsulation used for NAT traversal: N
Status: Active

配置关键点