MSR G2系列路由器和MSR系列路由器野蛮模式对接IPSec over L2TP典型配置

L2TP IPsec 江浩 2015-02-28 发表

1、双方使用野蛮模式建立IPsec隧道；

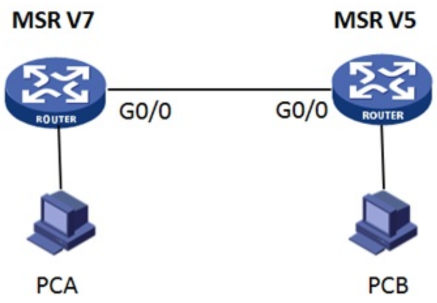
2、双方使用预共享密钥的方式建立IPsec；

3、MSR3620作为LAC，MSR3020作为LNS

4、LAC采用LAC-auto-initiate方式连接到LNS。

5、双方采用IPSec over L2TP的方式。

MSR3020和MSR3620之间路由可达，PCA使用MSR3620上的loopback 0口代替，PCB由MSR3020上的loopback 0口代替。



MSR3620（V7平台）配置：

#配置出接口地址：

```
[MSR3620] interface GigabitEthernet0/0

[MSR3620-GigabitEthernet0/0] ip address 10.0.0.1 255.255.255.0
```

#使用一个Loopback地址，用来模仿内部PC：

```
[MSR3620] interface LoopBack0

[MSR3620-LoopBack0] ip address 192.168.1.1 255.255.255.255
```

# 配置ACL 3000，定义要保护L2TP的数据流。

```
[MSR3620] acl number 3000
[MSR3620-acl-adv-3000] rule permit ip source 10.0.0.1 0 destination 10.0.0.2 0
[MSR3620-acl-adv-3000] quit
```

# 创建IPsec安全提议tran1

```
[MSR3620] ipsec transform-set tran1

[MSR3620-ipsec-transform-set-tran1] encapsulation-mode tunnel

[MSR3620-ipsec-transform-set-tran1] protocol esp

[MSR3620-ipsec-transform-set-tran1] esp encryption-algorithm des-cbc

[MSR3620-ipsec-transform-set-tran1] esp authentication-algorithm sha1

[MSR3620-ipsec-transform-set-tran1] quit
```

#配置IKE 的钥匙链，对端地址10.0.0.2，密钥为123

```
[MSR3620] ike keychain keychain1

[MSR3620-ike-keychain-keychain1]pre-shared-key address 10.0.0.2 255.255.255.255 key simple 123
```

#配置标识本端身份的方式为fqdn

```
[MSR3620]ike identity fqdn
```

#配置IKE profile，定义使用野蛮模式，本端名字为MSR3620，对端名字为MSR3020

```
[MSR3620] ike profile profile1

[MSR3620-ike-profile-profile1] exchange-mode aggressive

[MSR3620-ike-profile-profile1] local-identity fqdn MSR3620

[MSR3620-ike-profile-profile1] match remote identity fqdn MSR3020

[MSR3620-ike-profile-profile1] keychain keychain1
```

#配置IPSEC策略map1，调用了IKE profile、IPSEC提议、安全ACL以及指定对端地址

```
[MSR3620] ipsec policy map1 10 isakmp

[MSR3620-ipsec-policy-isakmp-map1-10] remote-address 10.0.0.2

[MSR3620-ipsec-policy-isakmp-map1-10] transform-set tran1

[MSR3620-ipsec-policy-isakmp-map1-10] security acl 3000

[MSR3620-ipsec-policy-isakmp-map1-10] ike-profile profile1

[MSR3620-ipsec-policy-isakmp-map1-10] quit
```

#物理接口下调用IPSEC策略

```
[MSR3620] interface GigabitEthernet0/0

[MSR3620-GigabitEthernet0/0] ipsec apply policy map1
```

#配置L2TP,隧道名为LAC，开启隧道认证，认证密码为aabbcc

```
[MSR3620] l2tp enable

[MSR3620] l2tp-group 1 mode lac

[MSR3620-l2tp1] tunnel name LAC

[MSR3620-l2tp1] lns-ip 10.0.0.2

[MSR3620-l2tp1] tunnel authentication

[MSR3620-l2tp1] tunnel password simple aabbcc

[MSR3620-l2tp1] quit
```

#创建虚拟PPP接口Virtual-PPP 1，配置PPP用户的用户名为vpdnuser、密码为Hello，并配置PPP验证方式为PAP

```
[MSR3620] interface virtual-ppp 1

[MSR3620-Virtual-PPP1] ip address ppp-negotiate

[MSR3620-Virtual-PPP1] ppp pap local-user vpdnuser password simple Hello

[MSR3620-Virtual-PPP1] quit
```

```
# 配置私网路由，访问公司总部的报文将通过L2TP隧道转发。
[MSR3620] ip route-static 192.168.2.1 24 virtual-ppp 1
# 触发LAC发起L2TP隧道建立请求。
[MSR3620] interface virtual-ppp 1
[MSR3620-Virtual-PPP1] l2tp-auto-client l2tp-group 1
```

MSR3020（V5平台）配置：

#配置出接口地址：

```
[MSR3020] interface GigabitEthernet0/0

[MSR3020-GigabitEthernet0/0] ip address 10.0.0.2 255.255.255.0
```

#创建loopback 0口，模拟内网的终端设备192.168.2.1

```
[MSR3020] interface LoopBack0

[MSR3020-LoopBack0] ip address 192.168.2.1 255.255.255.255
```

```
#配置ike peer
[MSR3020]ike peer MSR3620
[MSR3020-ike-peer-msr3620]pre-shared-key simple 123
[MSR3020-ike-peer-msr3620]remote-name MSR3620
[MSR3020-ike-peer-msr3620]local-name MSR3020
[MSR3020-ike-peer-msr3620]exchange-mode aggressive
# 创建IPsec安全提议tran1
[MSR30]ipsec transform-set tran1
[MSR3020-ipsec-transform-set-tran1]esp authentication-algorithm sha1
[MSR3020-ipsec-transform-set-tran1]esp encryption-algorithm des
#配置IPSEC策略模版
[MSR3020]ipsec policy-template temp1 10
[MSR3020-ipsec-policy-template-temp1-10]ike-peer MSR3620
[MSR3020-ipsec-policy-template-temp1-10]transform-set tran1
#配置IPSEC策略，调用策略模版
[MSR3020]ipsec policy map1 10 isakmp template temp1
#物理接口下调用IPSEC策略
[MSR3020] interface GigabitEthernet0/0
[MSR3020-GigabitEthernet0/0] ipsec policy map1
# 创建本地用户，配置用户名、密码及服务类型。
[MSR3020] local-user vpdnuser
[MSR3020-luser-vpdnuser] password simple Hello
[MSR3020-luser-vpdnuser] service-type ppp
[MSR3020-luser-vpdnuser] quit
# 配置虚拟模板接口Virtual-Template1的相关信息。
[MSR3020] interface virtual-template 1
[MSR3020-virtual-template1] ip address 100.0.0.1 255.255.255.0
[MSR3020-virtual-template1] remote address pool 1
[MSR3020-virtual-template1] ppp authentication-mode pap
[MSR3020-virtual-template1] quit
# 对VPN用户采用本地验证。
[MSR3020] domain system
[MSR3020-isp-system] authentication ppp local
[MSR3020-isp-system] ip pool 1 100.0.0.2 100.0.0.100
[MSR3020-isp-system] quit
#配置L2TP,隧道名为LAC，开启隧道认证，认证密码为aabbcc
[MSR3020] l2tp enable
[MSR3020] l2tp-group 1
[MSR3020-l2tp1] tunnel name LNS
[MSR3020-l2tp1] allow l2tp virtual-template 1 remote LAC
[MSR3020-l2tp1] tunnel authentication
[MSR3020-l2tp1] tunnel password simple aabbcc
[MSR3020-l2tp1] quit
# 配置私网路由，访问VPN用户的报文将通过L2TP隧道转发。
[MSR3020] ip route-static 192.168.1.1 24 virtual-template 1
```

配置结果：

触发建立IPSec之后，在MSR3620上使用display ike sa和display ipsec sa，可以看到如下：

```
display ike sa
    Connection-ID   Remote               Flag        DOI
------------------------------------------------------------------
    21              10.0.0.2             RD          IPSEC
Flags:
RD--READY RL--REPLACED FD-FADING
display ipsec sa
-------------------------------
Interface: GigabitEthernet0/0
-------------------------------

  -----------------------------
  IPsec policy: map1
  Sequence number: 10
  Mode: isakmp
  -----------------------------
    Tunnel id: 0
    Encapsulation mode: tunnel
    Perfect forward secrecy:
    Path MTU: 1443
    Tunnel:
        local  address: 10.0.0.1
        remote address: 10.0.0.2
    Flow:
    sour addr: 10.0.0.1/255.255.255.255  port: 0  protocol: ip
    dest addr: 10.0.0.2/255.255.255.255  port: 0  protocol: ip

    [Inbound ESP SAs]
      SPI: 798983257 (0x2f9f8459)
      Transform set: ESP-ENCRYPT-DES-CBC ESP-AUTH-SHA1
      SA duration (kilobytes/sec): 1843200/3600
      SA remaining duration (kilobytes/sec): 1843092/2983
      Max received sequence-number: 263
      Anti-replay check enable: Y
      Anti-replay window size: 64
      UDP encapsulation used for NAT traversal: N
      Status: active

    [Outbound ESP SAs]
      SPI: 3016720000 (0xb3cf7e80)
      Transform set: ESP-ENCRYPT-DES-CBC ESP-AUTH-SHA1
      SA duration (kilobytes/sec): 1843200/3600
      SA remaining duration (kilobytes/sec): 1843092/2983
      Max sent sequence-number: 254
      UDP encapsulation used for NAT traversal: N

      Status: active
```

触发建立L2TP之后，在MSR3620上使用display l2tp tuunel和display l2tp session，可以看到如下

```
display l2tp tunnel

LocalTID RemoteTID  State Sessions RemoteAddress   RemotePort RemoteName

41386    1         Established  1        10.0.0.2        1701       MSR30

display l2tp session

LocalSID    RemoteSID    LocalTID    State

1350        16363        41386       Established
```

1、本配置是L2TP OVER IPSEC，因此IPSEC感兴趣流acl要匹配L2TP封装后的数据包的地址。

2、V7侧ike profile下须要配置match remote命令，否则会导致DPD探测异常；

3、V7侧非IPSec模板方式，IPSec策略下须配置remote address命令，否则会导致无法触发IPSec触发。

4、在L2TP OVER IPSEC中，IPSec应用在物理口上。