

组网及说明

1 配置需求或说明

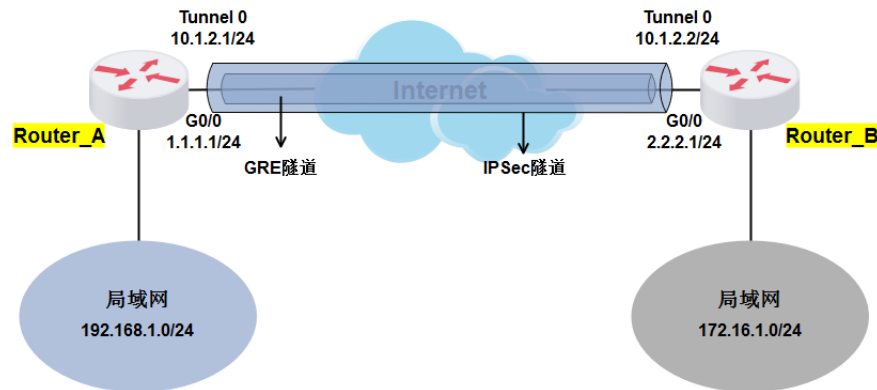
1.1 适用产品系列

本案例适用于如ICG5000G、ICG5000T、ICG6000系列的路由器。

1.2 配置需求及实现的效果

RTA路由器外网口G0/0的地址为1.1.1.1（模拟运营商公网固定地址环境），RTB路由器外网口G0/0的地址为2.2.2.1（模拟运营商公网固定地址环境），两个路由器外网口地址之间路由可达可以互相ping通。要对RTA路由器所在的内网（192.168.1.0/24）与RTB路由器所在的内网（172.16.1.0/24），实现两端内网终端通过GRE over IPsec VPN 隧道进行互访。

2 组网图



配置步骤

3 配置步骤

3.1 配置路由器基本上网

#路由器基本上网配置省略，MSR V7路由器的上网具体设置步骤请参考“2.1.2 路由器外网使用固定IP地址上网配置方法”章节中“MSR830-WiNet系列路由器基本上网（静态IP）命令行配置（V7）”案例

3.2 设置A路由器

#配置GRE隧道，

system-view

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

```
[H3C]interface Tunnel0 mode gre
```

```
[H3C-Tunnel0]ip address 10.1.2.1 24
```

```
[H3C-Tunnel0]source 1.1.1.1
```

```
[H3C-Tunnel0]destination 2.2.2.1
```

#配置一个访问控制列表3000，定义由子网1.1.1.0/24去子网2.2.2.0/24的数据流，封装GRE数据流。

```
[H3C]acl advanced 3000
```

```
[H3C-acl-ipv4-adv-3000]rule permit ip source 1.1.1.0 0.0.0.255 destination 2.2.2.0 0.0.0.255
```

```
[H3C-acl-ipv4-adv-3000]quit
```

#配置公网口NAT要关联的ACL 3001，作用是把IPsec感兴趣流从NAT转换的数据流deny掉，防止IPsec数据流被NAT优先转换

```
[H3C]acl number 3001
```

```
[H3C-acl-adv-3001]rule 0 deny ip source 1.1.1.0 0.0.0.255 destination 2.2.2.0 0.0.0.255
```

```
[H3C-acl-adv-3001]rule 1 permit ip
```

```
[H3C-acl-adv-3001]quit
```

#创建一条IKE提议1，指定IKE提议使用的认证算法为MD5，加密算法为3des-cbc

```
[H3C]ike proposal 1
```

```
[H3C-ike-proposal-1]authentication-algorithm md5
```

```
[H3C-ike-proposal-1]encryption-algorithm 3des-cbc
```

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

#创建并配置IKE keychain，名称为RTA。

```
[H3C]ike keychain RTA
```

#配置对端IP地址为2.2.2.1，使用的预共享密钥为明文123456

```
[H3C-ike-keychain-RTA]pre-shared-key address 2.2.2.1 255.255.255.0 key simple 123456
```

```

[H3C-ike-keychain-RTA]quit
#创建并配置IKE profile, 名称为RTA, 引用上面配置的keychain RTA, 配置本地地址为本端的公网接
口地址1.1.1.1, 对端地址为对端公网接口地址2.2.2.1, 引用之前配置IKE提议1
[H3C]ike profile RTA
[H3C-ike-profile-RTA]keychain RTA
[H3C-ike-profile-RTA]local-identity address 1.1.1.1
[H3C-ike-profile-RTA]match remote identity address 2.2.2.1 255.255.255.0
[H3C-ike-profile-RTA]proposal 1
[H3C-ike-profile-RTA]quit
#配置IPsec安全提议1, ESP协议采用的加密算法为3des-cbc, 认证算法为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
#创建IPsec安全策略, 名称为RTA, 序列号为1, 设置对端地址为对端公网地址2.2.2.1, 引用之前创建
的ACL3000, 引用之前创建的IKE profile RTA, 引用之前的IPSec安全提议1
[H3C]ipsec policy RTA 1 isakmp
[H3C-ipsec-policy-isakmp-RTA-1]remote-address 2.2.2.1
[H3C-ipsec-policy-isakmp-RTA-1]security acl 3000
[H3C-ipsec-policy-isakmp-RTA-1]transform-set 1
[H3C-ipsec-policy-isakmp-RTA-1]ike-profile RTA
[H3C-ipsec-policy-isakmp-RTA-1]quit
#设置外网口做NAT转换的时候关联ACL 3001 (如果之前已经在外网口配置了 nat outbound, 需要先
undo掉), 并将IPSec安全策略RTA应用在外网接口
[H3C]interface GigabitEthernet 0/0
[H3C-GigabitEthernet0/0]undo nat outbound
[H3C-GigabitEthernet0/0]nat outbound 3001
[H3C-GigabitEthernet0/0]ipsec apply policy RTA
[H3C-GigabitEthernet0/0]quit
#配置到对端内网的路由
[H3C]ip route-static 172.16.1.0 24 Tunnel 0
#保存配置
[H3C]save force

```

3.3 设置B路由器

```

#配置GRE隧道,
system-view
System View: return to User View with Ctrl+Z.
[H3C]interface Tunnel0 mode gre
[H3C-Tunnel0]ip address 10.1.2.2 24
[H3C-Tunnel0]source 2.2.2.1
[H3C-Tunnel0]destination 1.1.1.1
#配置一个访问控制列表3000, 定义由子网1.1.1.0/24去子网2.2.2.0/24的数据流, 封装GRE数据流。
[H3C]acl advanced 3000
[H3C-acl-ipv4-adv-3000]rule permit ip source 2.2.2.0 0.0.0.255 destination 1.1.1.0 0.0.0.255
[H3C-acl-ipv4-adv-3000]quit
#配置公网口NAT要关联的ACL 3001, 作用是把IPSec感兴趣流从NAT转换的数据流deny掉, 防止IPSe
c数据流被NAT优先转换
[H3C]acl number 3001
[H3C-acl-adv-3001]rule 0 deny ip source 2.2.2.0 0.0.0.255 destination 1.1.1.0 0.0.0.255
[H3C-acl-adv-3001]rule 1 permit ip
[H3C-acl-adv-3001]quit
#创建一条IKE提议1, 指定IKE提议使用的认证算法为MD5, 加密算法为3des-cbc
[H3C]ike proposal 1
[H3C-ike-proposal-1]authentication-algorithm md5
[H3C-ike-proposal-1]encryption-algorithm 3des-cbc
[H3C-ike-proposal-1]quit
#创建并配置IKE keychain, 名称为RTA。
[H3C]ike keychain RTA
#配置对端IP地址为1.1.1.1, 使用的预共享密钥为明文123456
[H3C-ike-keychain-RTA]pre-shared-key address 1.1.1.1 255.255.255.0 key simple 123456
[H3C-ike-keychain-RTA]quit
#创建并配置IKE profile, 名称为RTA, 引用上面配置的keychain RTA, 配置本地地址为本端的公网接
口地址2.2.2.1, 对端地址为对端公网接口地址1.1.1.1, 引用之前配置IKE提议1

```

```

[H3C]ike profile RTA
[H3C-ike-profile-RTA]keychain RTA
[H3C-ike-profile-RTA]local-identity address 2.2.2.1
[H3C-ike-profile-RTA]match remote identity address 1.1.1.1 255.255.255.0
[H3C-ike-profile-RTA]proposal 1
[H3C-ike-profile-RTA]quit
#配置IPsec安全提议1，ESP协议采用的加密算法为3des-cbc，认证算法为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
#创建IPsec安全策略，名称为RTA，序列号为1，设置对端地址为对端公网地址1.1.1.1，引用之前创建的ACL3000，引用之前创建的IKE profile RTA，引用之前的IPSec安全提议1
[H3C]ipsec policy RTA 1 isakmp
[H3C-ipsec-policy-isakmp-RTA-1]remote-address 1.1.1.1
[H3C-ipsec-policy-isakmp-RTA-1]security acl 3000
[H3C-ipsec-policy-isakmp-RTA-1]transform-set 1
[H3C-ipsec-policy-isakmp-RTA-1]ike-profile RTA
[H3C-ipsec-policy-isakmp-RTA-1]quit
#设置外网口做NAT转换的时候关联ACL 3001（如果之前已经在外网口配置了 nat outbound，需要先undo掉），并将IPSec安全策略RTA应用在外网接口
[H3C]interface GigabitEthernet 0/0
[H3C-GigabitEthernet0/0]undo nat outbound
[H3C-GigabitEthernet0/0]nat outbound 3001
[H3C-GigabitEthernet0/0]ipsec apply policy RTA
[H3C-GigabitEthernet0/0]quit
#配置到对端内网的路由
[H3C]ip route-static 192.168.1.0 24 Tunnel 0
#保存配置
[H3C]save force

```

3.4 验证配置结果

#在RTA路由器上带源ping RTB路由器内网网关地址

```

<H3C>ping -a 192.168.1.1 172.16.1.1
Ping 172.16.1.1 (172.16.1.1) from 192.168.1.1: 56 data bytes, press CTRL_C to break
Request time out
56 bytes from 172.16.1.1: icmp_seq=1 ttl=255 time=2.927 ms
56 bytes from 172.16.1.1: icmp_seq=2 ttl=255 time=1.955 ms
56 bytes from 172.16.1.1: icmp_seq=3 ttl=255 time=2.258 ms
56 bytes from 172.16.1.1: icmp_seq=4 ttl=255 time=1.607 ms

--- Ping statistics for 172.16.1.1 ---
5 packet(s) transmitted, 4 packet(s) received, 20.0% packet loss
round-trip min/avg/max/std-dev = 1.607/2.187/2.927/0.486 ms
<H3C>%Mar 24 16:29:22:606 2019 H3C PING/6/PING_STATISTICS: Ping statistics for 172.16.1.1:
5 packet(s) transmitted, 4 packet(s) received, 20.0% packet loss, round-trip min/avg/max/
std-dev = 1.607/2.187/2.927/0.486 ms.

```

配置关键点