MSR G2系列路由器和MSR系列路由对接dvpn配置

ADVPN 程咪 2019-11-28 发表

问题描述

MSR G2系列路由器和MSR系列路由对接dvpn配置

解决方法

MSR G2系列路由器和MSR系列路由器对接DVPN配置

一、 组网需求：

要求三台路由器之间之间路由可达，PC使用loopback口代替，并且有如下要求：

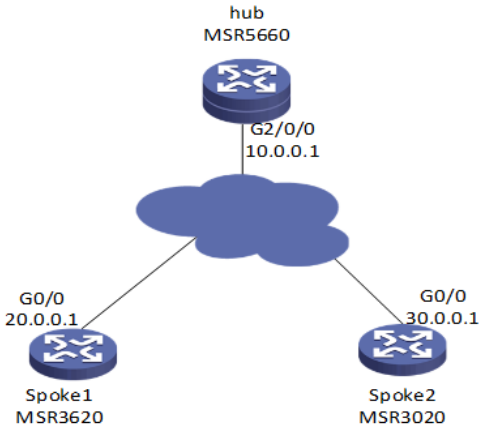
1、dvpn域名为abc

2、MSR5660作为hub端，MSR3620和3020作为spoke端，采用hub-spoke结构；

3、使用ipsec对数据进行加密；

4、MSR5660 作为VAMserver，采用本地认证。

二、 **组网图：**



IP地址规划：

设备	外网口IP	内网口IP	Tunnel口IP	Loopback ip
MSR5660	10.0.0.1/24	1.1.1.1/24	192.168.1.1/24	1.1.1.1/32
MSR3620	20.0.0.1/24	2.2.2.2/24	192.168.1.2/24	2.2.2.2/32
MSR3020	30.0.0.1/24	3.3.3.3/24	192.168.1.3/24	3.3.3.3/32

三、 配置步骤：

各设备上IP地址和默认路由的配置省略

MSR5660的配置步骤

1、 MSR5660上配置本地认证策略。为vam client 提供认证

```
#
domain abc
 authentication advpn local
#
#
local-user hub class network
 password cipher $c$3$E94XBBjAX2uaXnYWL1/Pa4n//W1DpQ==
 service-type advpn
 authorization-attribute user-role network-operator
#
local-user spoke1 class network
 password cipher $c$3$AjqXdiz0AapEEfP0hSDGOPPYBLbaXA==
 service-type advpn
 authorization-attribute user-role network-operator
#
local-user spoke2 class network
 password cipher $c$3$2sk1GhLNtPvmqPSTob81MbnIIta40Q==
 service-type advpn
 authorization-attribute user-role network-admin
```

```
 authorization-attribute user-role network-operator
#
```
2、 在MSR5660上配置VAMsever参数，dvpn域名为abc id为1
```
#
vam server advpn-domain abc id 1
 pre-shared-key cipher $c$3$CXwDOAhMccuNG323gs8c/lcT7EIu0A==
 authentication-method chap domain abc
 server enable
 hub-group 0
  hub private-address 192.168.1.1
  spoke private-address range 192.168.1.0 192.168.1.255
#
```
3、 在MSR5660上配置VAM client参数，自己作为hub端。
```
#
vam client name hub
 advpn-domain abc
 server primary ip-address 10.0.0.1
 pre-shared-key cipher $c$3$bWr5WXMFR/aUYs7f4O4ktGLFoqRVeg==
 user hub password cipher $c$3$aVtfVTH2c+z+1PYMAWKCMxEj/FERTA==
 client enable
#
```
4、 在MSR5660上配置ipsec安全框架
```
#
ipsec transform-set 1
 esp encryption-algorithm des-cbc
 esp authentication-algorithm md5
#
ipsec profile 1 isakmp
 transform-set 1
 ike-profile 1
#
ike profile 1
 keychain 1
#
ike keychain 1
 pre-shared-key address 0.0.0.0 0.0.0.0 key cipher $c$3$tdTO/lod2V5nncno4Jl/xviWb3tS6g==
#
```
5、 在MSR5660上配置dvpn隧道，采用udp模式封装。隧道上调用ipsec安全框架，并开启对V5版本的dvpn的兼容。
```
#
interface Tunnel1 mode advpn udp
 ip address 192.168.1.1 255.255.255.0
 ospf network-type p2mp
 source GigabitEthernet2/0/0
 tunnel protection ipsec profile 1
 vam client hub compatible advpn0
#
```
6、 在MSR5660上配置OSPF，将tunnel口和内网接口宣告进ospf。
```
#
ospf 1
 area 0.0.0.0
  network 1.1.1.0 0.0.0.255
  network 192.168.1.1 0.0.0.0
#
```
MSR3620的配置步骤

1、 在MSR3620上配置VAM client，自己作为spoke端
```
#
vam client name spoke1
 advpn-domain abc
 server primary ip-address 10.0.0.1
 pre-shared-key cipher $c$3$dAX5ZBSKxvlMfkirBj6bMox17un3Nw==
 user spoke1 password cipher $c$3$tpAUD0x7rQbXGMm+WzzBVgi9vYuKUQ==
```

```
 client enable
#
```
2、 在MSR3620上配置ipsec 安全框架
```
#
ipsec transform-set 1
 esp encryption-algorithm des-cbc
 esp authentication-algorithm md5
#
ipsec profile 1 isakmp
 transform-set 1
 ike-profile 1
#
ike profile 1
 keychain 1
#
ike keychain 1
 pre-shared-key address 0.0.0.0 0.0.0.0 key cipher $c$3$tAelqptq/gvntlZEeqOllrFXw5nqug==
#
```
3、 在MSR3620上配置dvpn隧道，采用udp封装模式，并在隧道接口上调用ipsec安全框架
```
#
interface Tunnel1 mode advpn udp
 ip address 192.168.1.2 255.255.255.0
 ospf network-type p2mp
 source GigabitEthernet0/0
 tunnel protection ipsec profile 1
 vam client spoke1
#
```
4、 在MSR3620上配置OSPF，将tunnel口和内网接口宣告进ospf。
```
#
ospf 1
 area 0.0.0.0
  network 2.2.2.0 0.0.0.255
  network 192.168.1.2 0.0.0.0
#
```

MSR3020的配置步骤

1、 在MSR3620上配置VAM client，自己作为spoke端
```
#
vam client name spoke2
 client enable
 server primary ip-address 10.0.0.1
 user spoke2 password cipher $c$3$JrAPoBzo8JMktfhDYpGyCyBck8LYTA==
 vpn abc
 pre-shared-key cipher $c$3$jC7Ix9gaoRob0xNinoC7qwXeVNsZdQ==
#
```
2、 在MSR3020上配置ipsec安全框架
```
#
ike peer 1
 pre-shared-key cipher $c$3$xAx7reyenG3PFL9Sq5akSY+hZ9UxVQ==
#
ipsec transform-set 1
 encapsulation-mode tunnel
 transform esp
 esp authentication-algorithm md5
 esp encryption-algorithm des
#
ipsec profile 1
 ike-peer 1
 transform-set 1
#
```
3、 在MSR3020上配置dvpn隧道，采用udp封装模式，并在隧道接口上调用ipsec安全框架
```
#
interface Tunnel1
 ip address 192.168.1.3 255.255.255.0
```

```
 tunnel-protocol dvpn udp
 source GigabitEthernet0/0
 ospf network-type p2mp
 ipsec profile 1
 vam client spoke2
#
```

4、 在MSR3020上配置OSPF，将tunnel口和内网接口宣告进ospf。

```
#
ospf 1
 area 0.0.0.0
  network 192.168.1.3 0.0.0.0
  network 3.3.3.0 0.0.0.255
#
```

四、 配置验证

1、在VAM sever（MSR5660）上查看vam client的注册情况。所有hub端和spoke端都应注册上。

```
<MSR56>display vam server address-map
ADVPN domain name: abc
Total private address mappings: 3
Group      Private address  Public address  Type   NAT  Holding time
0          192.168.1.1      10.0.0.1        Hub    No   0H 17M 49S
0          192.168.1.2      20.0.0.1        Spoke  No   0H 11M 38S
0          192.168.1.3      30.0.0.1        Spoke  No   0H 29M 8S
```

2、在hub端（MSR5660）上查看dvpn 会话状态。State应该为success。

```
<MSR56>display advpn session verbose
Interface         : Tunnel1
Client name       : hub
ADVPN domain name : abc
Link protocol     : IPsec-UDP
Number of sessions: 2
  Private address: 192.168.1.2
  Public address : 20.0.0.1
  ADVPN port     : 18001
  SA's SPI:
    inbound:  1736220816 (0x677ca090) [ESP]
    outbound: 871375101 (0x33f020fd) [ESP]
  Behind NAT     : No
  Session type   : Hub-Spoke
  State          : Success
  Holding time   : 0H 7M 53S
  Input : 68 packets,  65 data packets,  3 control packets
          27 multicasts,  0 errors
  Output: 74 packets,  71 data packets,  2 control packets
          35 multicasts,  1 errors

  Private address: 192.168.1.3
  Public address : 30.0.0.1
  ADVPN port     : 4571
  SA's SPI:
    inbound:  2877476916 (0xab82d034) [ESP]
    outbound: 1028202610 (0x3d492072) [ESP]
  Behind NAT     : No
  Session type   : Hub-Spoke
  State          : Success
  Holding time   : 0H 8M 26S
  Input : 53 packets,  52 data packets,  1 control packets
          19 multicasts,  0 errors
  Output: 60 packets,  59 data packets,  1 control packets
          38 multicasts,  0 errors
```

3、在vam clien端（MSR3620）查看vam注册状态，current state应该为ONLINE

```
<MSR36>display vam client fsm
Client name      : spoke1
Status           : Enabled
```

ADVPN domain name: abc
  Primary server: 10.0.0.1
    Private address: 192.168.1.2
    Interface   : Tunnel1
      Current state   : ONLINE (active)
      Client type   : Spoke
      Holding time   : 0H 1M 31S
      Encryption-algorithm   : AES-CBC-256
      Authentication-algorithm: HMAC-SHA1
      Keepalive   : 180 seconds, 3 times
      Hub number   : 1

4、在vam clien端（MSR3620）查看dvpn 会话， state应该为Success

<MSR36>display advpn session verbose
Interface   : Tunnel1
Client name   : spoke1
ADVPN domain name : abc
Link protocol   : IPsec-UDP
Number of sessions: 1
  Private address: 192.168.1.1
  Public address : 10.0.0.1
  ADVPN port   : 18001
  SA's SPI:
    inbound: 1389802046 (0x52d6b23e) [ESP]
    outbound: 3204125641 (0xbefb13c9) [ESP]
  Behind NAT   : No
  Session type   : Spoke-Hub
  State   : Success
  Holding time   : 0H 1M 33S
  Input : 22 packets, 20 data packets, 2 control packets
          6 multicasts, 0 errors
  Output: 19 packets, 17 data packets, 2 control packets
          5 multicasts, 0 errors

5、在vam clien端（MSR3020）查看vam注册状态，current state应该为ONLINE

<MSR30>dis vam client fsm
 Client name: spoke2
 VPN name: abc
 Interface: Tunnel1
 Resend interval(seconds): 5
 Client type: Spoke
 Username: spoke2

 Primary server: 10.0.0.1
   Current state: ONLINE
   Holding time: 0h 31m 33s
   Encryption-algorithm: AES-256
   Authentication-algorithm: SHA1

6、**在vam clien端（MSR3020）查看dvpn 会话， state应该为Success**

<MSR30>display dvpn session all
 Interface: Tunnel1 VPN name: abc Total number: 1

  Private IP: 192.168.1.1
  Public IP: 10.0.0.1
  Session type: Spoke-Hub
  State: SUCCESS
  Holding time: 0h 10m 36s
  Input: 64 packets, 63 data packets, 1 control packets
          42 multicasts, 0 errors
  Output: 57 packets, 56 data packets, 1 control packets
          23 multicasts, 0 errors

7、 连通性测试。Hub端和两个spoke端都能互通

<MSR56>ping -a 1.1.1.1 2.2.2.2

Ping 2.2.2.2 (2.2.2.2) from 1.1.1.1: 56 data bytes, press CTRL_C to break
56 bytes from 2.2.2.2: icmp_seq=0 ttl=255 time=0.918 ms
56 bytes from 2.2.2.2: icmp_seq=1 ttl=255 time=0.707 ms
56 bytes from 2.2.2.2: icmp_seq=2 ttl=255 time=0.695 ms
56 bytes from 2.2.2.2: icmp_seq=3 ttl=255 time=1.354 ms
56 bytes from 2.2.2.2: icmp_seq=4 ttl=255 time=0.740 ms

<MSR56>ping -a 1.1.1.1 3.3.3.3
Ping 3.3.3.3 (3.3.3.3) from 1.1.1.1: 56 data bytes, press CTRL_C to break
56 bytes from 3.3.3.3: icmp_seq=0 ttl=255 time=1.347 ms
56 bytes from 3.3.3.3: icmp_seq=1 ttl=255 time=1.280 ms
56 bytes from 3.3.3.3: icmp_seq=2 ttl=255 time=1.233 ms
56 bytes from 3.3.3.3: icmp_seq=3 ttl=255 time=1.233 ms
56 bytes from 3.3.3.3: icmp_seq=4 ttl=255 time=6.516 ms

五、 配置关键点

1、**V5和V7对接DVPN，V7设备的tunnel口上需要使用命令vam client xxx compatible advpn0开启兼容模式。否则会出现VAM能注册上，但是dvpn会话协商不起来的情况。**

2、**如果采用hub-spoke结构，tunnel接口上需要配置ospf网络类型为P2MP。**

3、**配置ipsec安全框架时，不需要指明对端地址，也不需要配置感兴趣流。**