MSR路由器MPLS L3VPN跨域方案C功能的配置

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MSR路由器

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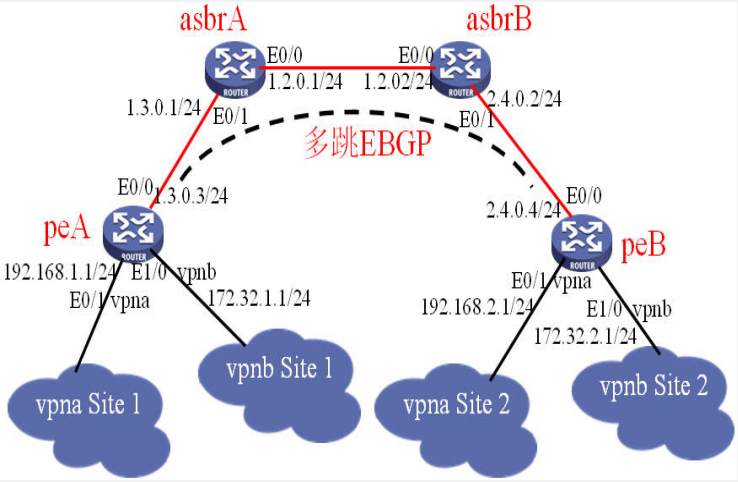
关键词：MSR;MPLS;L3VPN;跨域;OptionC

一、组网需求：

peA和asbrA在AS1，peB和asbrB在AS2；peA和peB都下挂着vpna和vpnb的站点，peA下挂vpna和vpnb站点1，peB下挂vpna和vpnb站点2。

设备清单：MSR路由器4台

二、组网图：



三、配置步骤：

适用设备和版本：MSR、Version 5.20, Beta 1105后所有版本。

peA配置：

```
#
 router id 3.3.3.3
#
ip vpn-instance vpna
 route-distinguisher 3:1
 vpn-target 1:1 export-extcommunity
 vpn-target 1:1 import-extcommunity
#
ip vpn-instance vpnb
 route-distinguisher 3:2
 vpn-target 2:2 export-extcommunity
 vpn-target 2:2 import-extcommunity
#
mpls lsr-id 3.3.3.3
#
mpls
#
mpls ldp
#
interface Ethernet0/0
 port link-mode route
 ip address 1.3.0.3 255.255.255.0
 mpls
 mpls ldp
#
interface Ethernet0/1
 port link-mode route
 ip binding vpn-instance vpna
 ip address 192.168.1.1 255.255.255.0
```

```
#
interface Ethernet1/0
 port link-mode route
 ip binding vpn-instance vpnb
 ip address 172.32.1.1 255.255.255.0
#
interface LoopBack0
 ip address 3.3.3.3 255.255.255.255
#
bgp 1
 undo synchronization
peer 4.4.4.4 as-number 2                    //与peB建立EBGP连接
 peer 1.1.1.1 as-number 1
 peer 4.4.4.4 ebgp-max-hop 64               //支持多跳EBGP连接
 peer 4.4.4.4 connect-interface LoopBack0    //使用环回口连接
 peer 1.1.1.1 label-route-capability         //使能标签路由能力
 peer 1.1.1.1 connect-interface LoopBack0
 #
 ipv4-family vpnv4
  peer 4.4.4.4 enable                       //与peB交换vpn路由
 #
 ipv4-family vpn-instance vpna
  import-route direct
 #
 ipv4-family vpn-instance vpnb
  import-route direct
#
ospf 1
 area 0.0.0.0
  network 3.3.3.3 0.0.0.0
  network 1.3.0.0 0.0.0.255
#
```

asbrA配置：

```
router id 1.1.1.1
#
mpls lsr-id 1.1.1.1
#
mpls
#
mpls ldp
#
acl number 2000             //定义ACL用于路由策略
 rule 0 permit source 3.3.3.3 0
 rule 5 deny
#
interface Ethernet0/0
 port link-mode route
 ip address 1.2.0.1 255.255.255.0
 mpls                       //使能MPLS流量转发能力
#
interface Ethernet0/1
 port link-mode route
 ip address 1.3.0.1 255.255.255.0
 mpls
 mpls ldp
#
interface LoopBack0
 ip address 1.1.1.1 255.255.255.255
#
bgp 1
network 3.3.3.3 255.255.255.255         //引入peA路由
 undo synchronization
 peer 1.2.0.2 as-number 2
 peer 3.3.3.3 as-number 1
```

```
 peer 1.2.0.2 route-policy asbrB export //应用路由策略
 peer 1.2.0.2 label-route-capability    //使能标签路由能力
 peer 3.3.3.3 route-policy peA export   //应用路由策略
 peer 3.3.3.3 label-route-capability    //使能标签路由能力
 peer 3.3.3.3 connect-interface LoopBack0
#
ospf 1
 area 0.0.0.0
  network 1.1.1.1 0.0.0.0
  network 1.3.0.0 0.0.0.255
#
route-policy asbrB permit node 0        //对asbrB的路由策略
 if-match acl 2000                      //匹配条件
 apply mpls-label                       //分标签操作
route-policy peA permit node 0          //对peA的路由策略
 if-match mpls-label                    //匹配条件
 apply mpls-label                       //分标签
#
```

asbrB配置：

```
#
 router id 2.2.2.2
#
mpls lsr-id 2.2.2.2
#
mpls
#
mpls ldp
#
acl number 2000             //定义ACL用于路由策略
 rule 0 permit source 4.4.4.4 0
 rule 5 deny
#
interface Ethernet0/0
 port link-mode route
 ip address 1.2.0.2 255.255.255.0
 mpls                       //使能MPLS流量转发能力
#
interface Ethernet0/1
 port link-mode route
 ip address 2.4.0.2 255.255.255.0
 mpls
 mpls ldp
#
interface LoopBack0
 ip address 2.2.2.2 255.255.255.255
#
bgp 2
network 4.4.4.4 255.255.255.255         //引入peB路由
 undo synchronization
 peer 1.2.0.1 as-number 1
 peer 4.4.4.4 as-number 2
 peer 1.2.0.1 route-policy asbrA export   //应用路由策略
 peer 1.2.0.1 label-route-capability      //使能标签路由能力
 peer 4.4.4.4 route-policy peB export     //应用路由策略
 peer 4.4.4.4 label-route-capability      //使能标签路由能力
 peer 4.4.4.4 connect-interface LoopBack0
#
ospf 1
 area 0.0.0.0
  network 2.2.2.2 0.0.0.0
  network 2.4.0.0 0.0.0.255
#
route-policy asbrA permit node 0         //对asbrA的路由策略
 if-match acl 2000                       //匹配条件
```

```
 apply mpls-label                        //分标签操作
route-policy peB permit node 0           //对peB的路由策略
 if-match mpls-label                     //匹配条件
 apply mpls-label                        //分标签
#
```

peB配置：

```
router id 4.4.4.4
#
ip vpn-instance vpna
 route-distinguisher 4:1
 vpn-target 1:1 export-extcommunity
 vpn-target 1:1 import-extcommunity
#
ip vpn-instance vpnb
 route-distinguisher 4:2
 vpn-target 2:2 export-extcommunity
 vpn-target 2:2 import-extcommunity
#
mpls lsr-id 4.4.4.4
#
mpls
#
mpls ldp
#
interface Ethernet0/0
 port link-mode route
 ip address 2.4.0.4 255.255.255.0
 mpls
 mpls ldp
#
interface Ethernet0/1
 port link-mode route
 ip binding vpn-instance vpna
 ip address 192.168.2.1 255.255.255.0
#
interface Ethernet1/0
 port link-mode route
 ip binding vpn-instance vpnb
 ip address 172.32.2.1 255.255.255.0
#
interface LoopBack0
 ip address 4.4.4.4 255.255.255.255
#
bgp 2
 undo synchronization
peer 3.3.3.3 as-number 1                 //与peA建立EBGP连接
 peer 2.2.2.2 as-number 2
 peer 3.3.3.3 ebgp-max-hop 64            //支持多跳EBGP连接
 peer 3.3.3.3 connect-interface LoopBack0 //使用环回口连接
 peer 2.2.2.2 label-route-capability     //使能标签路由能力
 peer 2.2.2.2 connect-interface LoopBack0
 #
 ipv4-family vpnv4
  peer 3.3.3.3 enable                    //与peA交换vpn路由
 #
 ipv4-family vpn-instance vpna
  import-route direct
 #
 ipv4-family vpn-instance vpnb
  import-route direct
#
ospf 1
 area 0.0.0.0
  network 4.4.4.4 0.0.0.0
```

network 2.4.0.0 0.0.0.255

#

四、配置关键点：

1. asbr上要配置匹配pe环回接口地址的ACL、对asbr和pe的路由策略；
2. asbr间不传递vpn路由，但是在bgp中要引入pe环回接口路由；
3. asbr上要仔细配置路由策略；
4. asbr间和asbr-pe间都要使能bgp路由标签能力；
5. pe间建立多跳EBGP连接必须要注意多跳选项；
6. pe间的多跳EBGP连接**必须**使用**环回接口**建立连接。