MSR路由器MPLS TE 快速重路由链路保护功能的配置

丘子隽 2006-09-08 发表

MSR路由器

MPLS TE 快速重路由功能的配置

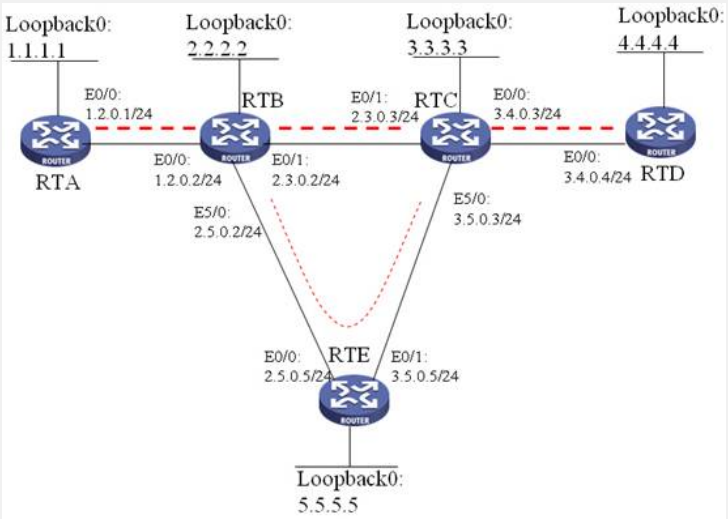
关键字：MSR;MPLS;TE;Fast-Reroute;快速重路由;RSVP-TE

一、组网需求：

RTA、RTB、RTC、RTD、RTE通过ISIS发布路由，RTA通过RSVP-TE + 显式路径建立一条到RTD的TE隧道，RTB为保护节点，通过显式路径建立一条经过RTE到RTC的链路，保护RTB与RTC的直连链路

设备清单：MSR路由器5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。

RTA配置

```
#
 router id 1.1.1.1
#
mpls lsr-id 1.1.1.1
#
#
mpls
mpls te
//使能RSVP-TE，快速重路由只能使用RSVP-TE，不能使用CRLDP
mpls rsvp-te
mpls te cspf
#
 //定义严格显式路径建立TE隧道主路径
 explicit-path pri
  next hop 1.2.0.2
  next hop 2.3.0.3
  next hop 3.4.0.4
  next hop 4.4.4.4
#
isis 1
 is-level level-2
cost-style wide
 network-entity 01.0000.1111.1111.1111.00
 is-name RTA
 traffic-eng level-2
#
interface Ethernet0/0
 port link-mode route
 description connects to RTB
 ip address 1.2.0.1 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface LoopBack0
 ip address 1.1.1.1 255.255.255.255
 isis enable 1
#
interface Tunnel0
 ip address 1.4.0.1 255.255.255.0
 tunnel-protocol mpls te
 destination 4.4.4.4
 isis enable 1
 isis small-hello
 mpls te record-route label
 mpls te bandwidth bc0 10
 //根据显式路径建立隧道
 mpls te path explicit-path pri
 //使隧道使能快速重路由感知
 mpls te fast-reroute
 mpls te igp shortcut
 mpls te igp metric absolute 20
 mpls te commit
#
```

RTB配置

```
#
router id 2.2.2.2
#
mpls lsr-id 2.2.2.2
#
mpls
mpls te
 mpls rsvp-te
mpls te cspf
#
 //用于保护主链路的旁路显式路径
 explicit-path bypass
  next hop 2.5.0.5
  next hop 3.5.0.3
  next hop 3.3.3.3
#
isis 1
 is-level level-2
 cost-style wide
 network-entity 01.0000.2222.2222.2222.00
 is-name RTB
 traffic-eng level-2
#
interface Ethernet5/0
 port link-mode route
 description connects to RTE
 ip address 2.5.0.2 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface LoopBack0
 ip address 2.2.2.2 255.255.255.255
 isis enable 1
#
interface Ethernet0/0
 port link-mode route
 description connects to RTA
 ip address 1.2.0.2 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface Ethernet0/1
 port link-mode route
 description connects to RTC
 ip address 2.3.0.2 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 //绑定重路由的旁路
 mpls te fast-reroute bypass-tunnel Tunnel0
 mpls rsvp-te
#
//定义旁路TE隧道
interface Tunnel0
 ip address 2.3.1.1 255.255.255.0
 tunnel-protocol mpls te
 destination 3.3.3.3
 mpls te record-route label
 //根据显式路径建立，必配
 mpls te path explicit-path bypass
 //指定备份带宽，必配
 mpls te backup bandwidth 10
 mpls te commit
#
```

RTC配置

```
#
router id 3.3.3.3
#
mpls lsr-id 3.3.3.3
#
mpls
 mpls te
 mpls rsvp-te
 mpls te cspf
#
isis 1
 is-level level-2
cost-style wide
 network-entity 01.0000.3333.3333.3333.00
 is-name RTC
 traffic-eng level-2
#
interface Ethernet5/0
 port link-mode route
 description connects to RTE
 ip address 3.5.0.3 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface LoopBack0
 ip address 3.3.3.3 255.255.255.255
 isis enable 1
#
interface Ethernet0/0
 port link-mode route
 description connects to RTD
 ip address 3.4.0.3 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface Ethernet0/1
 port link-mode route
 description connects to RTB
 ip address 2.3.0.3 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
```

RTD配置

```
#
router id 4.4.4.4
#
mpls lsr-id 4.4.4.4
#
mpls
 mpls te
 mpls rsvp-te
mpls te cspf
#
isis 1
 is-level level-2
cost-style wide
 network-entity 01.0000.4444.4444.4444.00
 is-name RTD
 traffic-eng level-2
#
interface Ethernet0/0
 port link-mode route
 description connects to RTC
 ip address 3.4.0.4 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
```

RTE配置

```
#
 router id 5.5.5.5
#
mpls lsr-id 5.5.5.5
#
mpls
 mpls te
 mpls rsvp-te
 mpls te cspf
#
isis 1
 is-level level-2
 bandwidth-reference 10000
 cost-style wide
 network-entity 01.0000.5555.5555.5555.00
 is-name RTE
 traffic-eng level-2
#
interface Ethernet0/0
 port link-mode route
 description connnects to RTB
 ip address 2.5.0.5 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface Ethernet0/1
 port link-mode route
 description connects to RTC
 ip address 3.5.0.5 255.255.255.0
 isis enable 1
 isis small-hello
 mpls
 mpls te
 mpls te max-link-bandwidth 100
 mpls te max-reservable-bandwidth 50
 mpls rsvp-te
#
interface LoopBack0
 ip address 5.5.5.5 255.255.255.255
 isis enable 1
#
```

四、配置关键点:

1) 快速重路由只能使用RSVP-TE作为信令协议;

2) 需要在RTA和RTB上建立显式路径，并且根据显式路径建立隧道;

3) RTA的Tunnel口上需要配置快速重路由感知;

4) RTB的Tunnel口必须要配置备份带宽;

5) RTB 将旁路Tunnel绑定在主隧道的出接口上。