

MSR路由器
MPLS TE 快速重路由功能的配置

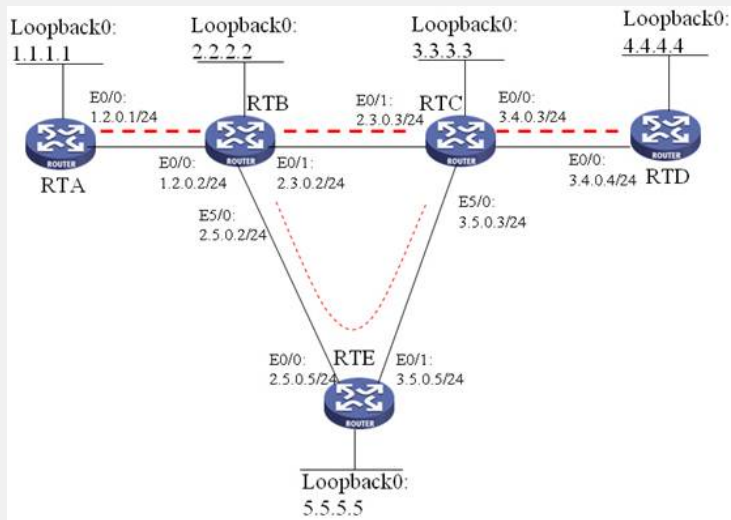
关键字: MSR;MPLS;TE;Fast-Reroute;快速重路由;RSVP-TE

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 01.0000.3333.3333.00
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 01.0000.4444.4444.00
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 connects 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。