

MSR 系列路由器 Standby track 功能配置举例

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1 简介

本文档介绍使用 TRACK 和 NQA 联动对链路状态检测并做出相应处理的典型配置。

2 配置前提

本文档不严格与具体软、硬件版本对应，如果使用过程中与产品实际情况有差异，请参考相关产品手册，或以设备实际情况为准。

本文档中的配置均是在实验室环境下进行的配置和验证，配置前设备的所有参数均采用出厂时的缺省配置。如果您已经对设备进行了配置，为了保证配置效果，请确认现有配置和以下举例中的配置不冲突。

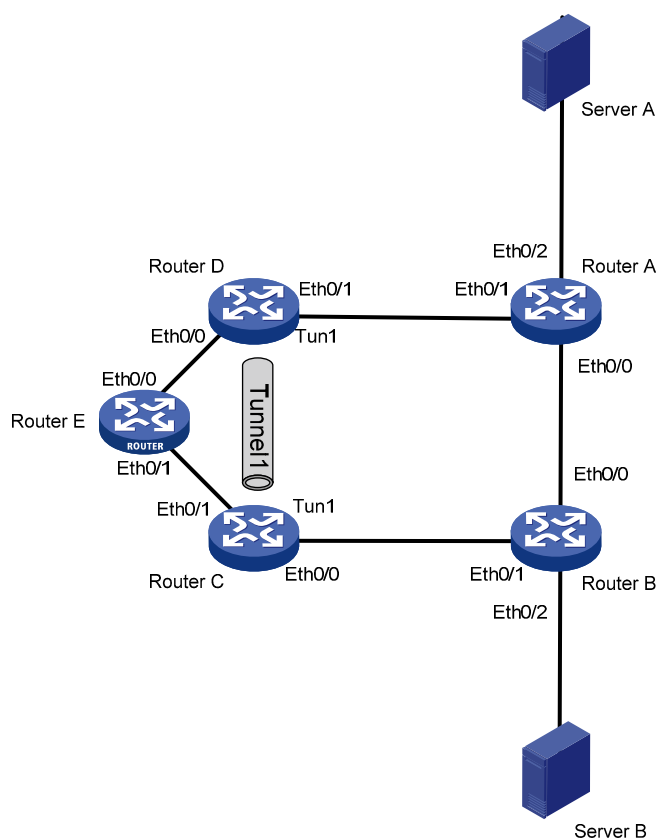
本文档假设您已了解接口备份、TRACK 和 NQA 特性。

3 配置举例

3.1 组网需求

如 [图 1](#)，Server A 所在网络部署了四台设备，路由器之间起 OSPF 协议。在正常情况下，由 Server B 和 Server A 通信通过路由器 AB 之间的链路；当路由器 A 和 B 之间链路接口出现故障时，数据通过隧道 Tunnel1 转发；当 A 和 B 之间链路接口故障恢复后，数据通过路由器 AB 之间链路转发。

图1 Track 配置组网图



设备	接口	IP地址	设备	接口	IP地址
Router A	Eth0/0	12.12.12.1/24	Router C	Eth0/0	23.23.23.2/24
	Eth0/1	14.14.14.2/24		Eth0/1	35.35.35.1/24
				Tun1	192.168.1.1/24
Router B	Eth0/0	12.12.12.2/24	Router D	Eth0/0	45.45.45.1/24
	Eth0/1	23.23.23.1/24		Eth0/1	14.14.14.1/24
Router E	Eth0/0	45.45.45.2/24			Tun1
	Eth0/1	35.35.35.2/24			

3.2 配置思路

- 为了让全网互通，各路由器上启用 OSPF 协议；
- 在 Router C 上采用 Standby track 功能，配置 NQA 监控 12.12.12.1 地址，如果发生异常数据切换到 Router C 到 Router D 链路。

3.3 使用版本

本举例是在 Release 2317 版本上进行配置和验证的。

3.4 配置注意事项

- 在 RouterC 与 RouterD 之间配置静态路由将流量引到隧道上；

- NQA 与 Track 的联动关联要匹配。

3.5 配置步骤

3.5.1 Router A的配置

```
<RouterA> system-view
[RouterA] interface Ethernet 0/0
[RouterA-Ethernet0/0] ip address 12.12.12.1 255.255.255.0
[RouterA-Ethernet0/0] quit
[RouterA] interface Ethernet 0/1
[RouterA-Ethernet0/1] ip address 14.14.14.1 255.255.255.0
[RouterA-Ethernet0/1] quit
# 配置 OSPF
[RouterA] ospf 1
[RouterA-ospf-1] area 1
[RouterA-ospf-1-area-0.0.0.1] network 14.14.14.1 0.0.0.255
[RouterA-ospf-1-area-0.0.0.1] network 12.12.12.1 0.0.0.255
[RouterA-ospf-1-area-0.0.0.1] quit
```

3.5.2 Router B的配置

```
<RouterB> system-view
[RouterB] interface Ethernet 0/0
[RouterB-Ethernet0/0] ip address 12.12.12.2 24
[RouterB-Ethernet0/0] quit
[RouterB] interface Ethernet 0/1
[RouterB-Ethernet0/1] ip address 23.23.23.1 24
[RouterB-Ethernet0/1] quit
# 配置 OSPF
[RouterB] ospf 1
[RouterB-ospf-1] area 0
[RouterB-ospf-1-area-0.0.0.0] network 23.23.23.0 0.0.0.255
[RouterB-ospf-1-area-0.0.0.0] quit
[RouterB-ospf-1] area 1
[RouterB-ospf-1-area-0.0.0.1] network 12.12.12.0 0.0.0.255
[RouterB-ospf-1-area-0.0.0.1] quit
```

3.5.3 Router C的配置

```
<RouterC> system-view
[RouterC] interface Ethernet 0/0
[RouterC-Ethernet0/0] ip address 23.23.23.2 24
[RouterC-Ethernet0/0] quit
[RouterC] interface Ethernet 0/1
[RouterC-Ethernet0/1] ip address 35.35.35.1 24
[RouterC-Ethernet0/1] quit
[RouterC] interface Tunnel 1
```

```

[RouterC-Tunnel1] ip address 192.168.1.1 255.255.255.0
[RouterC-Tunnel1] source 35.35.35.1
[RouterC-Tunnel1] destination 45.45.45.1
[RouterC-Tunnel1] standby track 1
# 配置 OSPF
[RouterC-Tunnel1] quit
[RouterC] ospf 1
[RouterC-ospf-1] area 0
[RouterC-ospf-1-area-0.0.0.0] network 192.168.1.0 0.0.0.255
[RouterC-ospf-1-area-0.0.0.0] network 23.23.23.0 0.0.0.255
[RouterC-ospf-1-area-0.0.0.0] quit
# 创建管理员名为 admin、操作标签为 test 的 NQA 测试组。
[RouterC] nqa entry admin oper
# 配置测试类型为 ICMP-echo
[RouterC-nqa-admin1-oper1] type icmp-echo
[RouterC-nqa-admin1-oper1-icmp-echo] destination ip 12.12.12.1
[RouterC-nqa-admin1-oper1-icmp-echo] frequency 1000
# 配置联动项 1（连续失败 3 次触发联动）
[RouterC-nqa-admin1-oper1-icmp-echo] reaction 1 checked-element probe-fail thres
hold-type consecutive 3 action-type trigger-only
# 配置 Track 项 1，关联 NQA 测试组
[RouterC] track 1 nqa entry admin oper reaction 1
[RouterC] nqa schedule admin oper start-time now lifetime forever
# 配置由 Router C 到 Router D 的静态路由
[RouterC] ip route-static 45.45.45.0 255.255.255.0 35.35.35.2

```

3.5.4 Router D 的配置

```

<RouterD> system-view
[RouterD] interface Tunnel 1
[RouterD-Tunnel1] ip address 192.168.1.2 24
[RouterD-Tunnel1] source 45.45.45.1
[RouterD-Tunnel1] destination 35.35.35.1
[RouterD] interface Ethernet 0/0
[RouterD-Ethernet0/0] ip address 45.45.45.1 24
[RouterD-Ethernet0/0] quit
[RouterD] interface Ethernet 0/1
[RouterD-Ethernet0/1] ip address 14.14.14.2 24
[RouterD-Ethernet0/1] quit
# 配置 OSPF
[RouterD] ospf 1
[RouterD-ospf-1] area 0
[RouterD-ospf-1-area-0.0.0.0] network 192.168.1.0 0.0.0.255
[RouterD-ospf-1-area-0.0.0.0] quit
[RouterD-ospf-1] area 1
[RouterD-ospf-1-area-0.0.0.1] network 14.14.14.0 0.0.0.255

```

配置由 Router D 到 Router C 的静态路由

```
[RouterD] ip route-static 35.35.35.0 255.255.255.0 45.45.45.2
```

3.6 验证配置

(1) Router A 与 Router B 之间链路正常工作，网络正常

```
[Router C] ping 14.14.14.1
PING 14.14.14.1: 56 data bytes, press CTRL_C to break
  Reply from 14.14.14.1: bytes=56 Sequence=0 ttl=254 time=2 ms
  Reply from 14.14.14.1: bytes=56 Sequence=1 ttl=254 time=4 ms
  Reply from 14.14.14.1: bytes=56 Sequence=2 ttl=254 time=1 ms
  Reply from 14.14.14.1: bytes=56 Sequence=3 ttl=254 time=2 ms
  Reply from 14.14.14.1: bytes=56 Sequence=4 ttl=254 time=1 ms

--- 14.14.14.1 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 1/2/4 ms
```

显示 Router C 上 Track 项的信息。

```
[RouterC] display track all
Track ID: 1
  Status: Positive
  Duration: 0 days 0 hours 1 minutes 40 seconds
  Notification delay: Positive 0, Negative 0 (in seconds)
  Reference object:
    NQA entry: admin oper
    Reaction: 1
```

#显示 ICMP-echo 测试中最后一次测试的结果。

```
[RouterC] display nqa result
NQA entry (admin admin, tag oper) test results:
  Destination IP address: 12.12.12.1
    Send operation times: 1          Receive response times: 1
    Min/Max/Average round trip time: 1/1/1
    Square-Sum of round trip time: 1
    Last succeeded probe time: 2013-10-14 20:46:37.4
  Extended results:
    Packet loss in test: 0%
    Failures due to timeout: 0
    Failures due to disconnect: 0
    Failures due to no connection: 0
    Failures due to sequence error: 0
    Failures due to internal error: 0
    Failures due to other errors: 0
    Packet(s) arrived late: 0
```

(2) Router A 与 Router B 之间链路故障时

链路故障后，测试网络

```
[Router C] ping 14.14.14.1
PING 14.14.14.1: 56 data bytes, press CTRL_C to break
Request time out
```

```
--- 14.14.14.1 ping statistics ---
 1 packet(s) transmitted
 0 packet(s) received
100.00% packet loss
```

几秒后隧道状态由 down 变为 up

```
%Jun  8 10:00:00:717 2013 Router C IFNET/3/LINK_UPDOWN: Tunnel1 link status is UP.
```

```
%Jun  8 10:00:00:718 2013 Router C IFNET/5/LINEPROTO_UPDOWN: Line protocol on the interface Tunnel1 is UP.
```

```
%Jun  8 10:00:05:457 2013 Router C OSPF/5/OSPF_NBR_CHG: OSPF 1 Neighbor 192.168.1.2(Tunnel1) from Loading to Full.
```

网络恢复正常

```
[Router C] ping 14.14.14.1
PING 14.14.14.1: 56 data bytes, press CTRL_C to break
Reply from 14.14.14.1: bytes=56 Sequence=0 ttl=254 time=2 ms
Reply from 14.14.14.1: bytes=56 Sequence=1 ttl=254 time=4 ms
Reply from 14.14.14.1: bytes=56 Sequence=2 ttl=254 time=1 ms
Reply from 14.14.14.1: bytes=56 Sequence=3 ttl=254 time=2 ms
Reply from 14.14.14.1: bytes=56 Sequence=4 ttl=254 time=1 ms
```

```
--- 14.14.14.1 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
round-trip min/avg/max = 1/2/4 ms
```

显示 Router C 上 Track 项的信息。

```
[RouterC] display track all
Track ID: 1
Status: Negative
Duration: 0 days 0 hours 0 minutes 34 seconds
Notification delay: Positive 0, Negative 0 (in seconds)
Reference object:
  NQA entry: admin oper
  Reaction: 1
```

#显示 ICMP-echo 测试中最后一次测试的结果。

```
[RouterC] display nqa result
NQA entry (admin admin, tag oper) test results:
Destination IP address: 12.12.12.1
Send operation times: 1          Receive response times: 0
Min/Max/Average round trip time: 0/0/0
```



```
Square-Sum of round trip time: 0
Last succeeded probe time: 0-00-00 00:00:00.0
Extended results:
Packet loss in test: 100%
Failures due to timeout: 0
Failures due to disconnect: 0
Failures due to no connection: 0
Failures due to sequence error: 0
Failures due to internal error: 0
Failures due to other errors: 1
Packet(s) arrived late: 0
```

3.7 配置文件

- Router A:

```
#
interface Ethernet0/0
port link-mode route
ip address 12.12.12.1 255.255.255.0
#
interface Ethernet0/1
port link-mode route
ip address 14.14.14.2 255.255.255.0
#
interface NULL0
#
ospf 1
area 0.0.0.1
network 14.14.14.0 0.0.0.255
network 12.12.12.0 0.0.0.255
#
```

- Router B

```
interface Ethernet0/0
port link-mode route
ip address 12.12.12.2 255.255.255.0
#
interface Ethernet0/1
port link-mode route
ip address 23.23.23.1 255.255.255.0
ospf 1
area 0.0.0.0
network 23.23.23.0 0.0.0.255
area 0.0.0.1
network 12.12.12.0 0.0.0.255
#
```

- Router C :

```
interface Ethernet0/0
```

```

port link-mode route
ip address 23.23.23.2 255.255.255.0
#
interface Ethernet0/1
port link-mode route
ip address 35.35.35.1 255.255.255.0
#
interface NULL0
#
interface Tunnell
ip address 192.168.1.1 255.255.255.0
source 35.35.35.1
destination 45.45.45.1
standby track
#
ospf 1
area 0.0.0.0
network 192.168.1.0 0.0.0.255
network 23.23.23.0 0.0.0.255
#
nqa entry admin oper
type icmp-echo
destination ip 12.12.12.1
frequency 1000
reaction 1 checked-element probe-fail threshold-type consecutive 3 action-type
trigger-only
#
ip route-static 45.45.45.0 255.255.255.0 35.35.35.2
#
track 1 nqa entry admin oper reaction 1
#
nqa schedule admin oper start-time now lifetime forever
#

```

- **Router D**

```

interface Ethernet0/0
port link-mode route
ip address 45.45.45.1 255.255.255.0
#
interface Ethernet0/1
port link-mode route
ip address 14.14.14.1 255.255.255.0
#
interface Tunnell
ip address 192.168.1.2 255.255.255.0
source 45.45.45.1
destination 35.35.35.1
#
ospf 1

```

```
area 0.0.0.0
 network 192.168.1.0 0.0.0.255
area 0.0.0.1
 network 14.14.14.0 0.0.0.255
#
ip route-static 35.35.35.0 255.255.255.0 45.45.45.2
#
```

4 相关资料

- H3C MSR 系列路由器 命令参考(V5)-R2311
- H3C MSR 系列路由器 配置指导(V5)-R2311