在GRE隧道的“%TUN-5-RECURDOWN”错误消息和振荡的EIGRP/OSPF/BGP邻接

Contents

Introduction

`%TUN-5-RECURDOWN 0`错误信息意味着通用路由封装(GRE)隧道路由器发现了一个递归路由问题。此情况通常归结于这些原因之一：

- 造成路由器设法路由到隧道目的地地址使用隧道接口的误配置(递归路由)
- 路由飘荡在别处造成的临时不稳定性的网络

隧道接口状态取决于IP可达性到隧道目的地。当路由器发现隧道目的地的时递归路由故障，几分钟关闭隧道接口下来，以便引起问题的情况能解决自己，当路由协议聚合。如果问题是由误配置引起的，链路能无限地摆动。

当相邻是在GRE封装隧道时，此问题的另一种症状不断地是拍动的增强的内部网关路由选择协议(EIGRP)、开放最短路径优先(OSPF)或者边界网关协议(BGP)相邻。

本文显示排除运行EIGRP的一个摆动的隧道接口故障示例。

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

本文档不限于特定的软件或硬件版本。

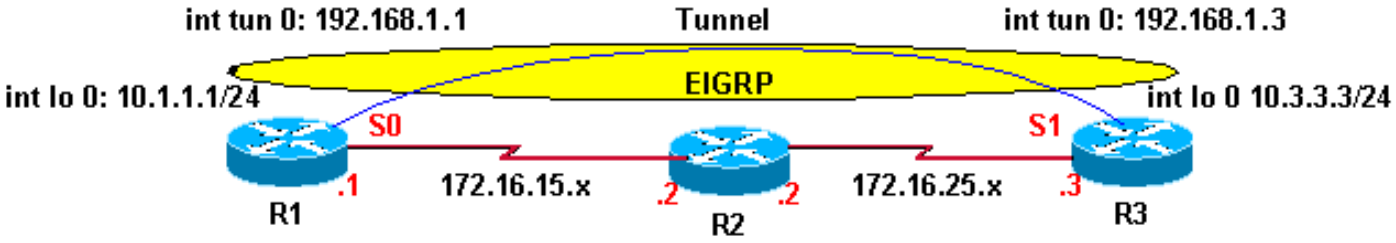
The information in this document was created from the devices in a specific lab environment.All of the devices used in this document started with a cleared (default) configuration.If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Network Diagram

路由器1 (R1)和路由器3 (R3)被连接到路由器2 (R2)。网络连通性是这样R1能通过R2到达R3's环回接口反之亦然。EIGRP在R1和R3的隧道接口运行。R2不作为EIGRP域的部分。



配置

- R1
- R3

R1

```
hostname R1
!
interface Loopback0
 ip address 10.1.1.1 255.255.255.0
!
interface Tunnel0
 ip address 192.168.1.1 255.255.255.0
 tunnel source Loopback0
 tunnel destination 10.3.3.3
!
interface Serial0
 ip address 172.16.15.1 255.255.255.0
 encapsulation ppp
!
router eigrp 1
 network 10.1.1.0 0.0.0.255
 network 192.168.1.0
 no auto-summary
!
ip route 0.0.0.0 0.0.0.0 172.16.15.2
```

R3

```
hostname R3
!
interface Loopback0
 ip address 10.3.3.3 255.255.255.0
!
interface Tunnel0
 ip address 192.168.1.3 255.255.255.0
 tunnel source Loopback0
 tunnel destination 10.1.1.1
!
interface Serial1
 ip address 172.16.25.3 255.255.255.0
!
router eigrp 1
 network 10.3.3.0 0.0.0.255
 network 192.168.1.0
 no auto-summary
!
ip route 0.0.0.0 0.0.0.0 172.16.25.2
```

观察

观察在R1和R3的这些错误信息。隧道接口的状态之间上上下下不断地摆动。

```
01:11:39: %LINEPROTO-5-UPDOWN:
          Line protocol on Interface Tunnel0, changed state to up
01:11:48: %TUN-5-RECURDOWN:
          Tunnel0 temporarily disabled due to recursive routing
01:11:49: %LINEPROTO-5-UPDOWN:
          Line protocol on Interface Tunnel0, changed state to down
01:12:49: %LINEPROTO-5-UPDOWN:
          Line protocol on Interface Tunnel0, changed state to up
01:12:58: %TUN-5-RECURDOWN:
          Tunnel0 temporarily disabled due to recursive routing
01:12:59: %LINEPROTO-5-UPDOWN:
          Line protocol on Interface Tunnel0, changed state to down
```

Note: 示例早先输出每条时间戳线路在实际输出中出现在一条线路。

排除故障

在隧道接口上升前，这是路由到R1的隧道目的地10.3.3.3 ：

```
R1# show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 172.16.15.2 to network 0.0.0.0

     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
```

```
C       172.16.15.2/32 is directly connected, Serial0
C       172.16.15.0/24 is directly connected, Serial0
     10.0.0.0/24 is subnetted, 1 subnets
C       10.1.1.0 is directly connected, Loopback0
S*   0.0.0.0/0 [1/0] via 172.16.15.2
```

隧道目的地10.3.3.3通过172.16.15.2 (Serial0)带默认路由出去。

现在，请观察路由表，在隧道接口上升后，显示这里：

```
R1# show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 172.16.15.2 to network 0.0.0.0

     172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks
D       172.16.25.0/24 [90/297756416] via 192.168.1.3, 00:00:00, Tunnel0
C       172.16.15.2/32 is directly connected, Serial0
C       172.16.15.0/24 is directly connected, Serial0
     10.0.0.0/24 is subnetted, 2 subnets
D       10.3.3.0 [90/297372416] via 192.168.1.3, 00:00:00, Tunnel0
C       10.1.1.0 is directly connected, Loopback0
C    192.168.1.0/24 is directly connected, Tunnel0
S*   0.0.0.0/0 [1/0] via 172.16.15.2
```

路由到隧道目的地10.3.3.3通过EIGRP是获知，并且其下一跳是interface tunnel 0。

在这种情况下，隧道目的地的最佳路径是通过隧道接口;然而，这发生：

1. 信息包在隧道接口的输出队列排队。
2. 隧道接口添加一个GRE报头到信息包并且排队信息包对传输协议被注定对隧道接口的目的地地址。
3. IP查寻路由对目的地地址并且获悉是通过隧道接口，返回信息包到上面Step1;因此，有递归路由环路。

解决方案

配置隧道目的地的静态路由R1和R3的。

```
R1(config)# ip route 10.3.3.3 255.255.255.255  serial 0
R3(config)# ip route 10.1.1.1 255.255.255.255 serial 1
```

现在，请观察在R1的IP路由，如下所示。

```
R1# show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
```

```
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 172.16.15.2 to network 0.0.0.0

     172.16.0.0/16 is variably subnetted, 3 subnets, 2 masks
D       172.16.25.0/24 [90/297756416] via 192.168.1.3, 00:01:08, Tunnel0
C       172.16.15.2/32 is directly connected, Serial0
C       172.16.15.0/24 is directly connected, Serial0
     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
S       10.3.3.3/32 is directly connected, Serial0
D       10.3.3.0/24 [90/297372416] via 192.168.1.3, 00:01:08, Tunnel0
C       10.1.1.0/24 is directly connected, Loopback0
C    192.168.1.0/24 is directly connected, Tunnel0
S*   0.0.0.0/0 [1/0] via 172.16.15.2
```

具体的静态路由(10.3.3.3/32)是更可取的对较不特定EIGRP学到的路由(10.3.3.0/24)隧道目的地的。此具体的静态路由避免递归路由环路、飘荡隧道接口，并且，因而， EIGRP相邻飘荡。

```
R1# show interfaces tunnel 0
Tunnel0 is up, line protocol is up
  Hardware is Tunnel
  Internet address is 192.168.1.1/24
  MTU 1514 bytes, BW 9 Kbit, DLY 500000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation TUNNEL, loopback not set
  Keepalive set (10 sec)
  Tunnel source 10.1.1.1 (Loopback0), destination 10.3.3.3
```

%Warning ：不支持硬件方面功能。隧道信息包将是被交换的软件

当同一环回或物理地址使用作为来源两条不同的隧道时，消息被看到。由于此，每个信息包去处理器，而不是被交换的硬件。

可以解决此问题，如果使用在环回接口的备用地址或，如果使用多个环回接口隧道源源点地址。

OSPF Hello信息包由在GRE封装隧道的路由器发送，但是不在另一端隧道的到达。

在被启用的OSPF中网络，路由器R1发送在GRE封装隧道的OSPF Hello信息包，但是没有由路由器R3接受。请使用debug ip ospf Hello命令为了调试Hello事件。

```
R1#debug ip ospf hello
May 31 13:58:29.675 EDT: OSPF: Send hello to 224.0.0.5 area 0.0.0.12 on Tunnel0 from 192.168.1.1
May 31 13:58:39.675 EDT: OSPF: Send hello to 224.0.0.5 area 0.0.0.12 on Tunnel0 from 192.168.1.1
May 31 13:58:49.675 EDT: OSPF: Send hello to 224.0.0.5 area 0.0.0.12 on Tunnel0 from 192.168.1.1
```

```
R3#debug ip ospf hello
May 31 15:02:07 ADT: OSPF: Send hello to 224.0.0.5 area 0.0.0.12 on Tunnel0 from 192.168.1.3
May 31 15:02:09 ADT: OSPF: Rcv hello from 172.16.15.1 area 0.0.0.12 from Tunnel0 192.168.1.1
May 31 15:02:09 ADT: OSPF: Send immediate hello to nbr 172.16.15.3, src address 192.168.1.3, on
Tunnel0
May 31 15:02:09 ADT: OSPF: Send hello to 224.0.0.5 area 0.0.0.12 on Tunnel0 from 192.168.1.3
!--- The previous output shows that the hello packets !--- re sent by R1 but not received by R3.
```

解决方案

配置tunnel key命令在两路由器的接口隧道10。此命令enable (event)在GRE组播。

Related Information

- 当使用GRE封装隧道时，为什么不能访问互联网？
- 增强的内部网关路由选择协议(EIGRP)技术支持