使用IOS XR配置GRT和VRF之间的路由泄漏

目录

简介

本文档介绍使用Cisco IOS® XR软件配置从全局路由表(GRT)到VRF的路由泄漏的过程。

先决条件

要求

Cisco 建议您了解以下主题：

- 基本IP路由知识
- Cisco IOS和Cisco IOS XR命令行知识

使用的组件

此过程不限于Cisco IOS XR中的任何软件版本，因此，所有版本都可用于完成后续步骤。

本文档中的信息基于以下软件和硬件版本：

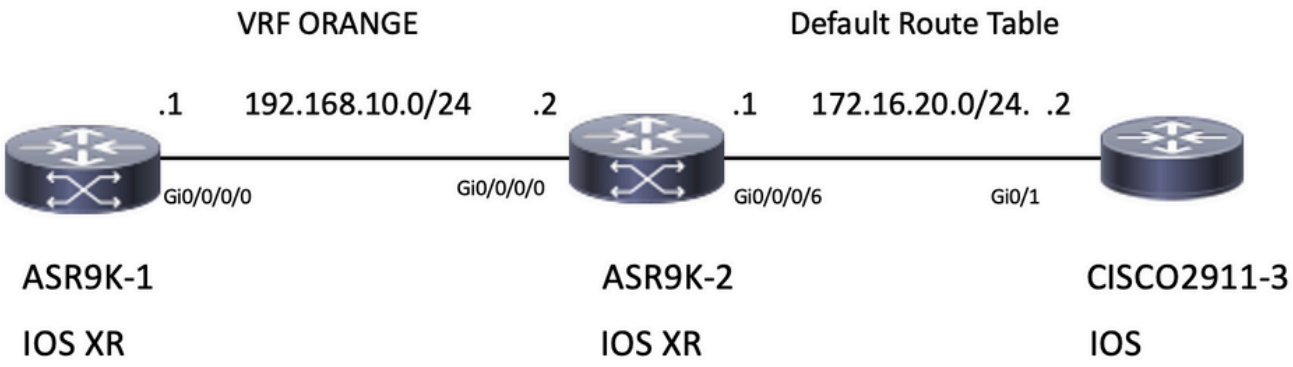
- 采用Cisco IOS XR软件的路由器
- 使用Cisco IOS软件的路由器

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

本演示的目的是显示全局路由表与之间路由泄漏的配置 vrf Cisco IOS XR上的路由表。

拓扑



初始验证

接口和静态路由配置

ASR9901-1

RP/0/RSP0/CPU0:ASR9901-1#**show run interface gi0/0/0/0** Wed Oct 19 15:21:21.122 UTC interface GigabitEthernet0/0/0/0 cdp vrf ORANGE ipv4 address 192.168.10.1 255.255.255.0 !
RP/0/RSP0/CPU0:ASR9901-1#**show run router static** Tue Feb 7 19:24:42.730 UTC router static vrf ORANGE address-family ipv4 unicast 172.16.20.0/24 192.168.10.2

ASR9901-2

RP/0/RSP0/CPU0:ASR9901-2#**show run int gi0/0/0/0**

```
Wed Oct 19 15:40:18.599 UTC
interface GigabitEthernet0/0/0/0
 cdp
 vrf ORANGE
 ipv4 address 192.168.10.2 255.255.255.0
!
```

RP/0/RSP0/CPU0:ASR9901-2#**show run int gi0/0/0/6**

```
Wed Oct 19 15:41:08.593 UTC
interface GigabitEthernet0/0/0/6
 cdp
 ipv4 address 172.16.20.1 255.255.255.0
!
```

CISCO 2911-3

CISCO2911-3#**show run interface gigabitEthernet0/1**

```
Building configuration...

Current configuration : 100 bytes
!
interface GigabitEthernet0/0
 ip address 172.16.20.2 255.255.255.0
 duplex auto
 speed auto
end
```

```
CISCO2911-3#show run | section ip route
ip route 192.168.10.0 255.255.255.0 172.16.20.1
```

使用ping测试连接，例如，ASR9901-1可以ping通VRF ORANGE上的ASR9901-2。

```
RP/0/RSP0/CPU0:ASR9901-1#ping vrf ORANGE 192.168.10.2
Wed Oct 19 15:57:50.548 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/3 ms
```

ASR9901-2可以ping通默认vrf(GRT)上的CISCO2911-3。

```
RP/0/RSP0/CPU0:ASR9901-2#ping 172.16.20.2
Wed Oct 19 15:58:05.961 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.20.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms
```

如果您尝试测试从ASR9K-1(VRF ORANGE)上的子网192.168.10.0/24到路由器2911上的子网172.16.20.0/24的可达性，此测试必须失败，因为ASR9K-2上未实施任何配置以完成VRF ORANGE与GRT之间的连接。

```
RP/0/RSP0/CPU0:ASR9901-1#ping 172.16.20.2 vrf ORANGE
Wed Oct 19 19:45:11.801 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.20.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

配置

第 1 步：在ASR9K-2中配置BGP进程，这是执行路由泄漏的路由器以及需要应用配置的位置。除了创建BGP进程外，还需要使用一些network语句来确保将计划泄漏的前缀安装在相应的BGP表中：

```
RP/0/RSP0/CPU0:ASR9901-2#show run router bgp
Wed Oct 19 20:21:55.118 UTC
router bgp 100
 bgp router-id 10.10.10.10
 address-family ipv4 unicast
  network 172.16.20.0/24
 !
 address-family vpnv4 unicast
 !
 vrf ORANGE
  rd 100:100
  address-family ipv4 unicast
   network 192.168.10.0/24
  !
 !
!

RP/0/RSP0/CPU0:ASR9901-2#
```

如您所见，无需创建任何BGP邻居关系，BGP需要将这些前缀放入BGP表中。

第二步：配置路由策略，这些策略旨在帮助您过滤允许泄露的前缀。在本示例中，使用route-policy

GLOBAL-2-VRF和route-policy VRF-2-GLOBAL。

```
RP/0/RSP0/CPU0:ASR9901-2#show run route-policy GLOBAL-2-VRF
Wed Oct 19 20:37:56.548 UTC
route-policy GLOBAL-2-VRF
  if destination in (172.16.20.0/24) then
    pass
  endif
end-policy
!

RP/0/RSP0/CPU0:ASR9901-2#show run route-policy VRF-2-GLOBAL
Wed Oct 19 20:38:10.538 UTC
route-policy VRF-2-GLOBAL
  if destination in (192.168.10.0/24 le 32) then
    pass
  endif
end-policy
!

RP/0/RSP0/CPU0:ASR9901-2#
```

第三步：配置VRF并使用命令**import from default-vrf route-policy <policy name>**和**export to default-vrf route-policy <policy name>**应用上一步创建的路由策略，如下面的输出所示：

```
RP/0/RSP0/CPU0:ASR9901-2#show run vrf ORANGE
Wed Oct 19 20:40:38.851 UTC
vrf ORANGE
 address-family ipv4 unicast
  import from default-vrf route-policy GLOBAL-2-VRF
  import route-target
   100:100
  !
  export to default-vrf route-policy VRF-2-GLOBAL
  export route-target
   100:100
  !
 !
!

RP/0/RSP0/CPU0:ASR9901-2#
```

最终验证

提交之前的配置后，您可以验证从ASR9K-1(VRF ORANGE)上的子网192.168.10.0/24到路由器2911上的子网172.16.20.0/24的可达性，该子网最初发生故障。但是，通过适当的配置，此ping测试现在成功：

```
RP/0/RSP0/CPU0:ASR9901-1#ping 172.16.20.2 vrf ORANGE
Wed Oct 19 22:07:47.897 UTC
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.20.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/3 ms
RP/0/RSP0/CPU0:ASR9901-1#
```

A debug ip icmp 在路由器2911上配置还可以帮助验证路由器是否将回应应答发送回ASR9K-1:

```
CISCO2911-3#debug ip icmp
ICMP packet debugging is on
CISCO2911-3#
CISCO2911-3#
*Oct 19 21:34:20.069: ICMP: echo reply sent, src 172.16.20.2, dst 192.168.10.1, topology BASE,
dscp 0 topoid 0
*Oct 19 21:34:20.073: ICMP: echo reply sent, src 172.16.20.2, dst 192.168.10.1, topology BASE,
dscp 0 topoid 0
*Oct 19 21:34:20.077: ICMP: echo reply sent, src 172.16.20.2, dst 192.168.10.1, topology BASE,
dscp 0 topoid 0
*Oct 19 21:34:20.077: ICMP: echo reply sent, src 172.16.20.2, dst 192.168.10.1, topology BASE,
dscp 0 topoid 0
*Oct 19 21:34:20.081: ICMP: echo reply sent, src 172.16.20.2, dst 192.168.10.1, topology BASE,
dscp 0 topoid 0
CISCO2911-3#
```

另一种验证是检查前缀是否出现在RIB和BGP表中，例如，GRT或default-vrf显示以下信息：

```
RP/0/RSP0/CPU0:ASR9901-2#show route
Wed Oct 19 22:15:03.930 UTC

Codes: C - connected, S - static, R - RIP, B - BGP, (>) - Diversion path
       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 - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local, G  - DAGR, l - LISP
       A - access/subscriber, a - Application route
       M - mobile route, r - RPL, t - Traffic Engineering, (!) - FRR Backup path

Gateway of last resort is not set

C    10.88.174.0/24 is directly connected, 1d20h, MgmtEth0/RSP0/CPU0/0
L    10.88.174.223/32 is directly connected, 1d20h, MgmtEth0/RSP0/CPU0/0
L    10.10.10.10/32 is directly connected, 04:33:44, Loopback100
C 172.16.20.0/24 is directly connected, 07:03:18, GigabitEthernet0/0/0/6
L    172.16.20.1/32 is directly connected, 07:03:18, GigabitEthernet0/0/0/6
B 192.168.10.0/24 is directly connected, 03:02:21, GigabitEthernet0/0/0/0 (nexthop in vrf
ORANGE)
RP/0/RSP0/CPU0:ASR9901-2#

RP/0/RSP0/CPU0:ASR9901-2#show ip bgp
Wed Oct 19 22:15:13.069 UTC
BGP router identifier 10.10.10.10, local AS number 100
BGP generic scan interval 60 secs
Non-stop routing is enabled
BGP table state: Active
Table ID: 0xe0000000   RD version: 5
BGP main routing table version 5
BGP NSR Initial initsync version 3 (Reached)
BGP NSR/ISSU Sync-Group versions 0/0
BGP scan interval 60 secs

Status codes: s suppressed, d damped, h history, * valid, > best
              i - internal, r RIB-failure, S stale, N Nexthop-discard
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network            Next Hop            Metric LocPrf Weight Path
*> 172.16.20.0/24 0.0.0.0 0 32768 i *> 192.168.10.0/24 0.0.0.0 0 32768 i

Processed 2 prefixes, 2 paths
RP/0/RSP0/CPU0:ASR9901-2#
```

现在，下一个输出显示了VRF ORANGE的信息：

RP/0/RSP0/CPU0:ASR9901-2#**show route vrf ORANGE**
Wed Oct 19 22:21:24.559 UTC

Codes: C - connected, S - static, R - RIP, B - BGP, (>) - Diversion path
       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 - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local, G - DAGR, l - LISP
       A - access/subscriber, a - Application route
       M - mobile route, r - RPL, t - Traffic Engineering, (!) - FRR Backup path

Gateway of last resort is not set

B 172.16.20.0/24 is directly connected, 01:43:49, GigabitEthernet0/0/0/6 (nexthop in vrf default) C 192.168.10.0/24 is directly connected, 07:06:38, GigabitEthernet0/0/0/0
L   192.168.10.2/32 is directly connected, 07:06:38, GigabitEthernet0/0/0/0
RP/0/RSP0/CPU0:ASR9901-2#
RP/0/RSP0/CPU0:ASR9901-2#
RP/0/RSP0/CPU0:ASR9901-2#**show bgp vrf ORANGE**
Wed Oct 19 22:21:34.887 UTC
BGP VRF ORANGE, state: Active
BGP Route Distinguisher: 100:100
VRF ID: 0x60000003
BGP router identifier 10.10.10.10, local AS number 100
Non-stop routing is enabled
BGP table state: Active
Table ID: 0xe0000012   RD version: 9
BGP main routing table version 9
BGP NSR Initial initsync version 4 (Reached)
BGP NSR/ISSU Sync-Group versions 0/0

Status codes: s suppressed, d damped, h history, * valid, > best
              i - internal, r RIB-failure, S stale, N Nexthop-discard
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network   Next Hop   Metric LocPrf Weight Path
Route Distinguisher: 100:100 (default for vrf ORANGE)
***> 172.16.20.0/24 0.0.0.0 0 32768 i *> 192.168.10.0/24 0.0.0.0 0 32768 i**

Processed 2 prefixes, 2 paths

关于此翻译
思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

请注意：即使是最好的机器翻译，其准确度也不及专业翻译人员的水平。

Cisco Systems, Inc. 对于翻译的准确性不承担任何责任，并建议您总是参考英文原始文档（已提供链接）。