

使用IOS XR配置GRT和VRF之間的路由洩漏

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簡介

本檔案介紹使用Cisco IOS® XR軟體設定從Global Routing Table(GRT)到VRF的路由洩漏的程序。

必要條件

需求

思科建議您瞭解以下主題：

- 基本IP路由知識
- Cisco IOS和Cisco IOS XR命令列知識

採用元件

此程式不限於Cisco IOS XR中的任何軟體版本，因此，所有版本均可用於完成後續步驟。

本文中的資訊係根據以下軟體和硬體版本：

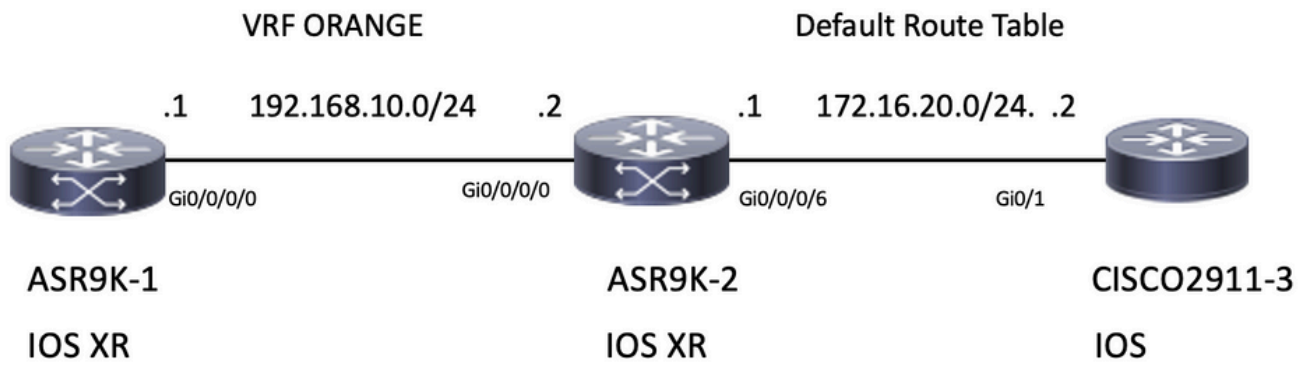
- 採用Cisco IOS XR軟體的路由器
- 採用Cisco IOS軟體的路由器

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

背景資訊

本演示的目的是顯示全域性路由表與之間的路由洩漏的配置 vrf Cisco IOS XR上的路由表。

拓撲



初始驗證

介面和靜態路由配置

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測試連線，例如，ASR9901-1可以ping通VRF橙色路由器上的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可對預設vrf(GRT)上的CISCO2911-3執行ping操作。

```
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
```

如果您嘗試測試從ASR9K-1(VRF ORANGE)上的子網192.168.10.0/24到路由器2911上的子網172.16.20.0/24的可達性，此測試必須失敗，因為ASR9K-2上未實施任何配置以完成VRF ORANGE和GRT之間的連線。

```
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)
```

組態

步驟1。在ASR9K-2中配置BGP進程，這是執行路由洩漏的路由器以及需要應用配置的位置。除了建立BGP進程外，還需要使用一些network語句以確保在相應的BGP表中安裝您計畫洩漏的字首：

```
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#
```

您可以看到，無需建立任何BGP鄰居關係，需要BGP將這些字首放入BGP表中。

步驟2。配置路由策略，這些策略旨在幫助您過濾允許洩漏的字首。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#
```

步驟3。配置VRF並使用import from default-vrf route-policy <policy name>和export to default-vrf route-policy <policy name>命令應用在上一步建立的路由策略，如下面的輸出所示：

```
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#
```

最終驗證

提交先前的配置後，您可以驗證從ASR9K-1(VRF ORANGE)上的子網192.168.10.0/24到路由器2911上的子網172.16.20.0/24的可達性，該子網最初發生故障。但是如果有了適當的組態，這個ping測試現在成功了：

```
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上配置也可以幫助驗證路由器是否將回應回覆傳送回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#

另一個驗證是檢查字首是否出現在RIB和BGP表中，例如，GRT或default-vrf顯示下一個資訊：

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#

現在，下一個輸出顯示為VRF橙色顯示的資訊：

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
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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

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。