Configurar multicast entre VRF sem vazamento de rota entre VRF unicast

Contents

Introduction

Este documento descreve como você pode encaminhar um fluxo multicast que vem de uma origem no Virtual Routing and Forwarding (VRF) e vai para usuários no receptor VRF sem vazar de rota unicast entre VRF.

Prerequisites

Requirements

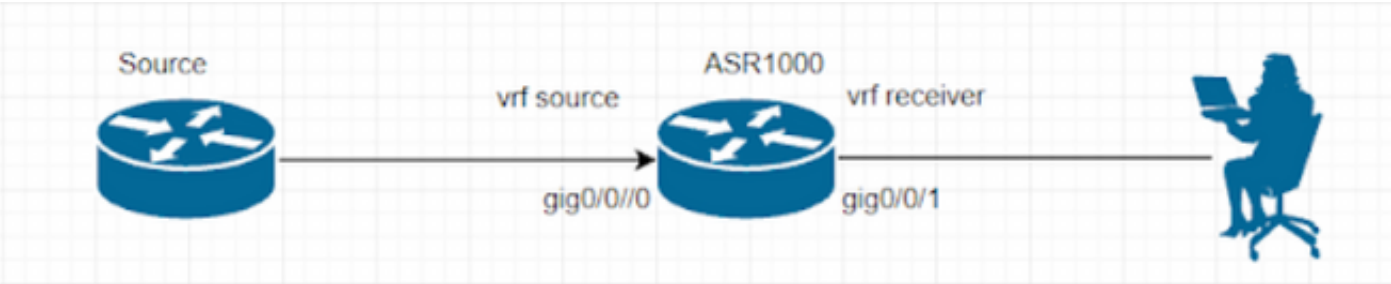
A Cisco recomenda que você tenha conhecimento da funcionalidade PIM e do ASM.

Componentes Utilizados

As informações neste documento são baseadas no ASR1000.

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. Se a rede estiver ativa, certifique-se de que você entenda o impacto potencial de qualquer comando.

Diagrama de Rede



Configurações

Gerar fluxo multicast UDP na origem.

```
Source#

ip sla 1

udp-echo 239.1.1.1 2000 source-ip 10.1.1.1

ip sla schedule 1 life forever start-time now
```

O receptor é configurado com IGMP e envia relatórios de associação IGMP.

O roteador ASR1000 está fazendo o encaminhamento de tráfego multicast entre vrf. O loopback 1 na 'origem' do VRF é o RP para ambos os VRFs.

```
ASR1000#

ip vrf source

rd 1:1

!

ip vrf receiver

rd 2:2

!

ip multicast-routing vrf source distributed

ip multicast-routing vrf receiver distributed


ip pim vrf source rp-address 1.1.1.1

ip pim vrf receiver rp-address 1.1.1.1


interface Loopback1

ip vrf forwarding source

ip address 1.1.1.1 255.255.255.255

ip pim sparse-mode


interface GigabitEthernet0/0/0

ip vrf forwarding source

ip address 10.1.1.2 255.255.255.0

ip pim sparse-mode
```

```
interface GigabitEthernet0/0/1

ip vrf forwarding receiver

ip address 20.1.1.2 255.255.255.0

ip pim sparse-mode
```

(S, G) entrada não é formada no vrf 'receive' por enquanto.

```
ASR1002-1#show ip mroute vrf source

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,

L - Local, P - Pruned, R - RP-bit set, F - Register flag,

T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,

X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,

U - URD, I - Received Source Specific Host Report,

Z - Multicast Tunnel, z - MDT-data group sender,

Y - Joined MDT-data group, y - Sending to MDT-data group,

G - Received BGP C-Mroute, g - Sent BGP C-Mroute,

N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,

Q - Received BGP S-A Route, q - Sent BGP S-A Route,

V - RD & Vector, v - Vector, p - PIM Joins on route,

x - VxLAN group, c - PFP-SA cache created entry,

* - determined by Assert

Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode


(*, 239.1.1.1), 00:05:01/stopped, RP 1.1.1.1, flags: SPF

Incoming interface: Null, RPF nbr 0.0.0.0

Outgoing interface list: Null

(10.1.1.1, 239.1.1.1), 00:05:01/00:02:26, flags: PFT

Incoming interface: GigabitEthernet0/0/0, RPF nbr 0.0.0.0

Outgoing interface list: Null


(*, 224.0.1.40), 00:07:03/00:02:59, RP 1.1.1.1, flags: SJCL

Incoming interface: Null, RPF nbr 0.0.0.0
```

```
Outgoing interface list:

Loopback1, Forward/Sparse, 00:07:01/00:02:59

ASR1002-X-1#sh ip mroute vrf receiver
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group, c - PFP-SA cache created entry,
* - determined by Assert, # - iif-starg configured on rpf intf,
e - encap-helper tunnel flag
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode


(*, 239.1.1.1), 00:03:23/00:02:44, RP 1.1.1.1, flags: SJC
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
GigabitEthernet0/0/1, Forward/Sparse, 00:03:23/00:02:44
```

Para corrigir isso, você precisa fazer uma seleção de VRF para passar na verificação de RPF.

```
ip access-list standard 1

permit 239.1.1.1 log

exit

ip multicast vrf receiver rpf select vrf source group-list 1
```

Verificar

Use esta seção para confirmar se a sua configuração funciona corretamente.

Depois de executar as etapas mencionadas anteriormente, o feed Multicast pode ser visto no receptor.

```
Receiver#show flow monitor test cache format table

Cache type: Normal (Platform cache)

Cache size: 200000

Current entries: 1

High Watermark: 3


Flows added: 50
```

```
Flows aged: 49

- Inactive timeout ( 15 secs) 49


IPV4 SRC ADDR IPV4 DST ADDR TRNS SRC PORT TRNS DST PORT INTF INPUT FLOW SAMPLER ID IP TOS IP
PROT ip src as ip dst as ipv4 next hop addr ipv4 src mask ipv4 dst mask tcp flags intf output
bytes pkts time first time last

============== ============== ============ ============ ================== ==============
====== ======= ======== ======== ================= ============ ============ ========
================== ========== ========== ============ ============

10.1.1.1 239.1.1.1 57314 1967 Gi0/0/3 0 0x00 17 0 0 0.0.0.0 /0 /0 0x00 Null 80 1 11:09:08.082
11:09:08.082
```

Captura de pacote no receptor.

```
> Frame 1: 94 bytes on wire (752 bits), 94 bytes captured (752 bits)
> Ethernet II, Src: Cisco_93:70:01 (00:a6:ca:93:70:01), Dst: IPv4mcast_01:01:01 (01:00:5e:01:01:01)
v Internet Protocol Version 4, Src: 10.1.1.1, Dst: 239.1.1.1
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
  > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 80
    Identification: 0x0000 (0)
  > Flags: 0x00
    Fragment Offset: 0
    Time to Live: 254
    Protocol: UDP (17)
    Header Checksum: 0xc198 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 10.1.1.1
    Destination Address: 239.1.1.1
> User Datagram Protocol, Src Port: 54527, Dst Port: 1967
> Data (52 bytes)
```

A entrada (S, G) é formada no receptor VRF.

```
ASR1002-1#show ip mroute vrf receiver 239.1.1.1
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected, L - Local,
P - Pruned, R - RP-bit set, F - Register flag, T - SPT-bit set, J - Join SPT,
M - MSDP created entry, E - Extranet, X - Proxy Join Timer Running,
A - Candidate for MSDP Advertisement, U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender, Y - Joined MDT-data group,
y - Sending to MDT-data group, G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route, V - RD & Vector, v - Vector,
p - PIM Joins on route, x - VxLAN group, c - PFP-SA cache created entry,
* - determined by Assert Outgoing interface flags: H - Hardware switched,
A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state:
Interface, Next-Hop or VCD, State/Mode

(*, 239.1.1.1), 00:21:36/stopped, RP 1.1.1.1, flags: SJC
Incoming interface: Loopback1, RPF nbr 1.1.1.1, using vrf source
Outgoing interface list:
GigabitEthernet0/0/1, Forward/Sparse, 00:21:36/00:02:43
```

```
(10.1.1.1, 239.1.1.1), 00:03:55/stopped, flags: T
Incoming interface: GigabitEthernet0/0/0, RPF nbr 0.0.0.0, using vrf source
Outgoing interface list:
GigabitEthernet0/0/1, Forward/Sparse, 00:03:55/00:02:43


ASR1002-1#show ip mroute vrf source 239.1.1.1
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group, c - PFP-SA cache created entry,
* - determined by Assert
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 239.1.1.1), 00:22:36/stopped, RP 1.1.1.1, flags: SJCFE
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list: Null

Extranet receivers in vrf receiver:
(*, 239.1.1.1), 00:21:54/stopped, RP 1.1.1.1, OIF count: 1, flags: SJC

(10.1.1.1, 239.1.1.1), 00:04:14/00:02:55, flags: FTE
Incoming interface: GigabitEthernet0/0/0, RPF nbr 0.0.0.0
Outgoing interface list: Null

Extranet receivers in vrf receiver:
(10.1.1.1, 239.1.1.1), 00:04:14/stopped, OIF count: 1, flags: T


ASR1002-1#show ip mfib vrf receiver 239.1.1.1
Entry Flags: C - Directly Connected, S - Signal, IA - Inherit A flag,
ET - Data Rate Exceeds Threshold, K - Keepalive
DDE - Data Driven Event, HW - Hardware Installed
ME - MoFRR ECMP entry, MNE - MoFRR Non-ECMP entry, MP - MFIB
MoFRR Primary, RP - MRIB MoFRR Primary, P - MoFRR Primary
MS - MoFRR Entry in Sync, MC - MoFRR entry in MoFRR Client.
I/O Item Flags: IC - Internal Copy, NP - Not platform switched,
NS - Negate Signalling, SP - Signal Present,
A - Accept, F - Forward, RA - MRIB Accept, RF - MRIB Forward,
MA - MFIB Accept, A2 - Accept backup,
RA2 - MRIB Accept backup, MA2 - MFIB Accept backup

Forwarding Counts: Pkt Count/Pkts per second/Avg Pkt Size/Kbits per second
Other counts: Total/RPF failed/Other drops
I/O Item Counts: HW Pkt Count/FS Pkt Count/PS Pkt Count Egress Rate in pps
VRF receiver
(*,239.1.1.1) Flags: C HW
SW Forwarding: 0/0/0/0, Other: 0/0/0
HW Forwarding: 0/0/0/0, Other: 1/1/0
GigabitEthernet0/0/1 Flags: NS
(10.1.1.1,239.1.1.1) Flags: HW
SW Forwarding: 0/0/0/0, Other: 0/0/0
HW Forwarding: 15/0/94/0, Other: 0/0/0
```

```
GigabitEthernet0/0/1 Flags: NS
```

Além disso, não há entrada unicast no receptor de VRF RIB para RP e IP de origem.

```
ASR1002-1#show ip route vrf receiver 1.1.1.1
Routing Table: receiver % Network not in table

ASR1002-1#show ip route vrf receiver 10.1.1.1
Routing Table: receiver % Network not in table
```

Assim, o RPF mostra como falhou, o que é esperado, no entanto, o tráfego multicast será encaminhado.

```
ASR1002-1#show ip rpf vrf receiver 1.1.1.1
failed, no route exists
ASR1002-1#show ip rpf vrf receiver 10.1.1.1
failed, no route exists
```

Há outra forma de conseguir isso, que é a seguinte:

```
ip mroute vrf receiver 10.1.1.0 255.255.255.0 fallback-lookup vrf source

ip mroute vrf receiver 1.1.1.1 255.255.255.255 fallback-lookup vrf source
```

Com isso, a verificação de RPF será bem-sucedida.

```
ASR1002-1#show ip rpf vrf receiver 1.1.1.1
RPF information for ? (1.1.1.1)
RPF interface: Loopback1
RPF neighbor: ? (1.1.1.1) - directly connected
RPF route/mask: 1.1.1.1/32
RPF type: multicast (connected)
Doing distance-preferred lookups across tables
Using Extranet RPF Rule: Static Fallback Lookup, RPF VRF: source
RPF topology: ipv4 multicast base

ASR1002-1#show ip rpf vrf receiver 10.1.1.1
RPF information for ? (10.1.1.1)
RPF interface: GigabitEthernet0/0/0
RPF neighbor: ? (10.1.1.1) - directly connected
RPF route/mask: 10.1.1.0/24
RPF type: multicast (connected)
Doing distance-preferred lookups across tables
Using Extranet RPF Rule: Static Fallback Lookup, RPF VRF: source
RPF topology: ipv4 multicast base
```

No entanto, você pode usar o **RPF select** ou o comando **fallback lookup**, ambos eventualmente cumprem nosso propósito.

Troubleshoot

Atualmente, não existem informações disponíveis específicas sobre Troubleshooting para esta configuração.