

# Configuración de Inter-VRF Multicast sin Fuga de Rutas Unicast Inter-VRF

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## Introducción

Este documento describe cómo se puede reenviar una secuencia de multidifusión que viene de un origen en el origen de routing y reenvío virtuales (VRF) y va hacia los usuarios en el receptor VRF sin que se filtre la ruta entre VRF de unidifusión.

## Prerequisites

### Requirements

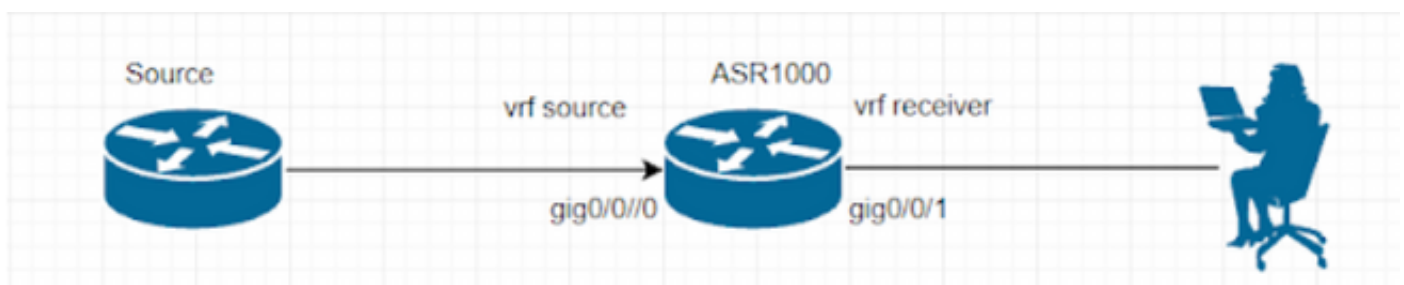
Cisco recomienda que conozca la funcionalidad de PIM y ASM.

### Componentes Utilizados

La información en este documento se basa en 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. Si tiene una red en vivo, asegúrese de entender el posible impacto de cualquier comando.

## Diagrama de la red



# Configuraciones

Genere la secuencia de multidifusión UDP en el origen.

```
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
```

El receptor se configura con IGMP y envía informes de afiliación IGMP.

El router ASR1000 está realizando el reenvío de tráfico multicast entre vrf. Loopback 1 en VRF 'source' es el RP para ambos VRF.

```
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
```

La entrada (S, G) no se forma en vrf 'receive' por ahora.

```
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 corregir esto, debe realizar una selección de VRF para pasar la verificación 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
```

## Verificación

Use esta sección para confirmar que su configuración funciona correctamente.

Después de realizar los pasos mencionados anteriormente, se puede ver la fuente de multidifusión en el 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 paquetes en el 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)
```

### La entrada (S, G) se forma en el 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

Además, no hay entrada de unidifusión en la RIB del receptor VRF para RP y la IP de origen.

```
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
```

Por lo tanto, RPF muestra como fallado lo que se espera, sin embargo, el tráfico multicast será reenviado.

```
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
```

Hay otra forma de lograrlo, que es la siguiente:

```
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
```

Con esto, la verificación de RPF será exitosa.

```
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
```

Sin embargo, puede utilizar el comando **RPF select** o el comando **fallback lookup**, ambos eventualmente cumplen con nuestro propósito.

## Troubleshoot

Actualmente, no hay información específica de troubleshooting disponible para esta configuración.