

# نېب VRF لوكوتورېل ددعتملا ثېلا نېوكت نېب راسملا بېرست نود VRF تاكېش VRF تاكېش

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## عمدقملا

ردصم يف ردصم نم يتاي ثېلا ددعتم ثې قفدت هيچوت عمدا عمديك دننسملا اذه فصيفي  
عارج نود VRF لبقنسم يف نيمدختسملا وحن هچتو (VRF) يرهاطلا هيچوتلا عمداو هيچوتلا  
يديحلال ثېلل VRF نېب راسملا بېرست

## عمس اساسال تابلطملا

### تابلطملا

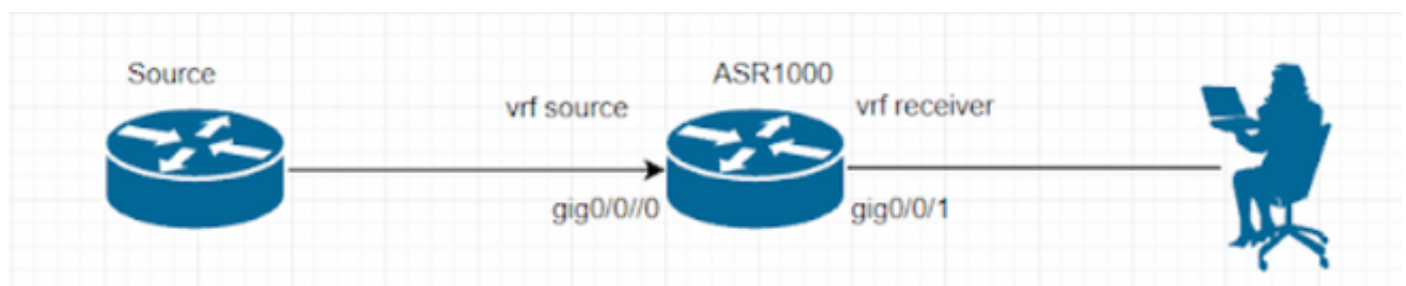
ASM و PIM فئاظوب عمفرعم كيدل نوكت ناب Cisco يصوت

### عمدختسملا تانوكملا

ASR1000 ىلا دننسملا اذه يف عمراولا تامولعملا دننست

عمصاخ عمي لمعم عمئيب يف عموجوملا عمزعمال نم دننسملا اذه يف عمراولا تامولعملا عماشن مم  
تنك اذا (يضا رتفا) حوسمم نېوكت دننسملا اذه يف عمدختسملا عمزعمال عمي ممج تادب  
رمأ يال لمحملا ريثاتلل كمهف نم دكاتف ، ليغشتلا ديقتك كېش

## عمكېشلل يطيطختلا مسرلا



# تاني وكتلا

ردصملا ىلع ددعتملا ثبلا ل UDP قفد ءاشناب مق

```
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
```

IGMP ةيوضع ريراقت لسريو IGMP لوكوتورب مادختساب لابقتسال زاغ نيوكت متي

1 عاجرتسال VRF تاكبش ني ب ددعتملا ثبلا رورم ةكرح هيحوت ةداعاب ASR1000 هجوملا موقبي VRFs نم لكل RP وه VRF 'source' في

```
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
```

يلاحل تقولا في "لابقتسا" VRF في لخال لانيوكت متي مل (s, g).

```
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

يسكعلا راسملا هي جوت ةداعإ نم ققحتلا ريرمتل VRF ديحت كملزي، اذه حالصال (RPF).

```
ip access-list standard 1
```

```
permit 239.1.1.1 log
```

```
exit
```

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

## ةحصلال نم ققحتلا

ححص لكشب نيوكتلا لمع ديكأتل مسقلا اذه مدختسا

لبقستسملا لىع ددعتملا ثبلال بيوزجوم ةيؤر نكمي، اقباس ةروكذملا تاوطخلا ذيفنت دع

```
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

ل.ب.ق.س.م.ل.ا ي.ل.ع ة.م.ز.ح.ل.ا ط.ا.ق.ت.ل.ا

```
> 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)
< 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)
```

(s, g) ل.ب.ق.س.م.ل.ا ي.ل.ع ة.م.ز.ح.ل.ا ط.ا.ق.ت.ل.ا 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

IP ردصم ل و RP ل RIB ل بق تسم VRF ل ي ف لخدم unicast نم ام ك انه ، اضيأ

```
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
```

ةداع م ت تس ، كلذ عمو ، عقوتم لش فك (RPF) يسك عل راسم ل هي جوت ةداع رهظت ، يلات ل ابو  
ددعت ل ثب ل رورم ةك رح هي جوت .

```
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
```

ي لي امك ي هو ، اذه قي قحت ل رخ أ ق ي رط ك ان هو :

```
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
```

احجان (RPF) يسك عل راسم ل هي جوت ةداع نم ق قحت ل نو ك يس ، اذ هب

```
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
```

ثحب ل رم أ و (RPF) يسك عل راسم ل هي جوت ةداع دي دحت رم أ ام ا مدخت س ا كن كم ي ، كلذ عمو  
فاطم ل ة ي اهن ي ف ان فدهب ي ف ي ام هال كو ، ي طاي ت حال ا

## اه حال ص او عا ط خ ال فاش ك ت سا

ن ي و ك ت ل ا ذ ه ل اه حال ص او عا ط خ ال فاش ك ت سا ل ة د دحم ت ام و ل عم ا ي ل ا ح ر ف و ت ت ال

ةمچرتل هذه لوج

ةللأل تاي نقتل نمة ومة مادختساب دن تسمل اذة Cisco تمةرت  
ملاعلاء انء مء مء نمة دختسمل معد و تمة مء دقتل ةر شبل او  
امك ةق قء نوك ت نل ةللأل ةمچرت لصف أن ةظحال مء ءرء. ةصاأل مء تءل ب  
Cisco ةلخت. فرتمة مچرت مء دقء ةل ةل ةفارتحال ةمچرتل عم لاعل او  
ىل إأمءءاد ءوچرلاب ةصوء و تامةرتل هذه ةقء نء اهءل وئس م Cisco  
Systems (رفوتم طبارل) ةلصلأل ةزءل ءن إل دن تسمل