

# سأرلا ىلعا نم لثامملا خس نلا نم ققحتلا SD ىلا لوصولا ةينب يف

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[ةيزكرملا ةجلاعمللا ةدحو عاقتنا راسم - عاشنا \(S,G\)](#)

[MROUTE Hardware - IOS](#) مروتى جمانرب

[IOS MFIB](#) - راسملا ةزهجأ ةجمرى

[MROUTE - RP MFIB](#) ةزهجأ ةجمرى

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## ةمدقملا

يف اهال ص او HeadEnd ل لثامتملا خس نلا عاطخأ فاشك تسأ ةيفيك دنتسمملا اذه حضوي

SD (SDA) إلى لوصول أة ن ب

## ة ساس أال اابل طم ل

### اابل طم ل

ة لال ا ع يضاوم ل ا ب ة فرعم ك ي دل نوكت ن ا ب Cisco ي صوت

- (IP) ن نرت ن ا ل لوكوت و ر ب ه ي جوت ة دا ع |
- (LISP) ع قوم ل ا د د ح م / فرعم ل ل ص ف لوكوت و ر ب
- (PIM) د د ح م لوكوت و ر ب ل ع د ا م ت ع ا ل ا ن و د د د ع ت م ل ا ث ب ل ل ر ث ا ن ت م ل ا ع ض و ل ا

### ة م د خ ت س م ل ا ت ا ن و ك م ل

- C9000v ل ع Cisco IOS® XE 17.10.1
- Cisco Catalyst Center، ر ا د ص ا ل ا 2.3.5.3

ة ص ا خ ة ي ل م ع م ة ئ ي ب ي ف ة د و ج و م ل ا ة ز ه ج ا ل ا ن م د ن ت س م ل ا ا ذ ه ي ف ة د ر ا و ل ا ت ا م و ل ع م ل ا ع ا ش ن ا م ت ن ا ك ا ذ ا . (يضا ر ت ف ا) ح و س م م ن ي و ك ت ب د ن ت س م ل ا ا ذ ه ي ف ة م د خ ت س م ل ا ة ز ه ج ا ل ا ع ي م ج ت ا د ب ر م ا ي ا ل ل م ت ح م ل ا ر ي ث ا ت ل ل ك م ه ف ن م د ك ا ت ف ، ل ي غ ش ت ل ا د ي ق ك ت ك ب ش

ة غ ي ص ة ي ج م ر ب و ز ا ه ج ا ذ ه ع م ت ل م ع ت س ا ت ن ك ا ض ي ا ع ي ط ت س ي ق و ي ث و ا ذ ه

- C9200
- C9300
- C9400
- C9500
- C9600
- Cisco IOS® XE 16.12 ا ر ا د ص ا ل ا و

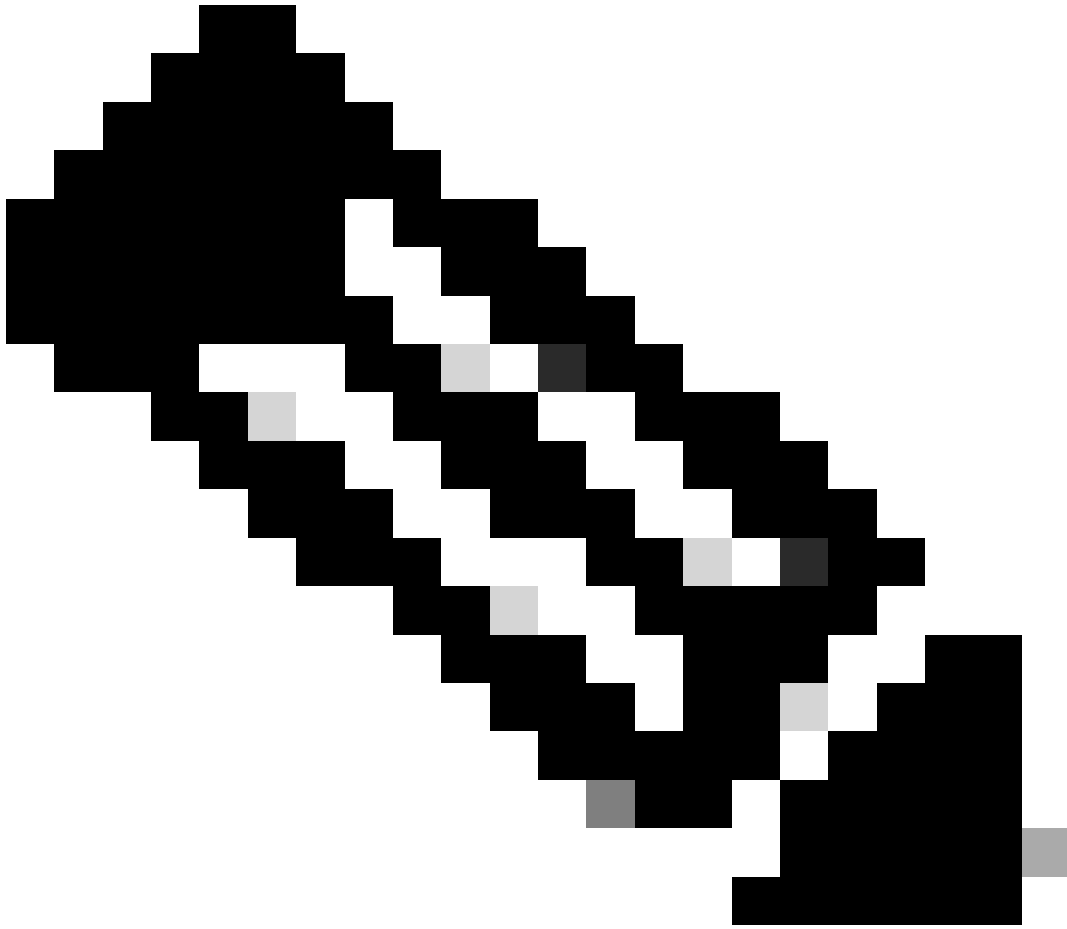
## ة ساس ا تام و ل ع م

م ت ي ي ذ ل ا و ، د د ع ت م ل ا ث ب ل ا ة ي ش غ ت ن م ل ك ش و ه SDA ل ث ب ل ا و ل ا ب ق ت س ا ل ا ة د ح و خ س ن ث ب ل ا ر و ر م ة ك ر ح ن ي م ض ت و ، ة ي ن ب ل ا ة ز ه ج ا ن ي ب د د ع ت م ل ا ث ب ل ا ر و ر م ة ك ر ح ل م ح ل ه م ا د خ ت س ا ل ا ب ق ت س ا ل ا ة ك ب ش ل ل ث ا م ت م ل ا خ س ن ل ا م و ق ي ن ا ن ك م ي . ي د ا ح ا ل ا ث ب ل ل IP س ا ر ي ف د د ع ت م ل ا (ت ا ل ب ق ت س م ل ا) م ل ت س م ل ا و (ر د ا ص م ل ا) ر د ص م ل ا ن ي ب د د ع ت م ل ا ث ب ل ا ر و ر م ة ك ر ح ه ي ج و ت ب ث ب ل ا و ة ك ب ش ل د د ع ت م ل ا ث ب ل ا ه ي ج و ت ن ك م ي) ة ف ل ت خ م VLAN ة ك ب ش و ا ه س ف ن VLAN ة ك ب ش ي ف ا م ا (ا ه س ف ن VLAN).

ة ي ن ب ل ا ة ف ا ح ل ع ت ا ل ب ق ت س م ل ا و ر د ا ص م ل ا ن ي ب د د ع ت م ل ا ث ب ل ا ر و ر م ة ك ر ح ه ي ج و ت ة دا ع ا م ت ت ا ل ا ه ي ج و ت م ت ي ن ك ل و ، (VXLAN) ة ي ر ه ا ط ل ا ة ي ل ح م ل ا ة ك ب ش ل ا ر ب ع د د ع ت م ث ب م ا د خ ت س ا ب ا ه س ف ن ة . ة ي ن ب ل ا ة ف ا ح ة ط س ا و ب ا ي ل ح م

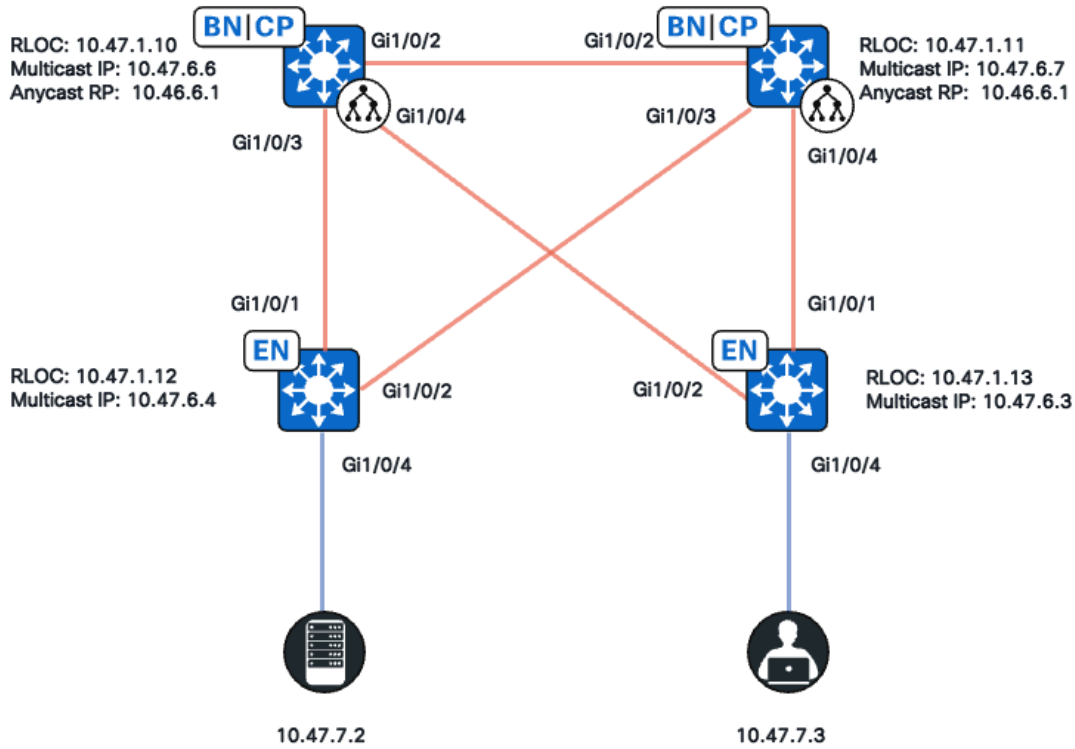
ث ب ل ا و ل ا ب ق ت س ا ل ا ة د ح و) ف ل غ م ل ا د د ع ت م ل ا ث ب ل ل ا ك ش ا ن م ل ك ش ي ا م و ق ي ن ا ن ك م ي ا ل 1=TTL ع م و ا ، 224.0.0.0/24 ق ا ط ن ل ا ي ف ت ا ع و م ج م ل ل د د ع ت م ل ا ث ب ل ا ر و ر م ة ك ر ح ه ي ج و ت ب (ي ل ص ا ل ا) 2 ة ق ب ط ل ا ر م غ ر ب ع ك ل ذ ة ج ل ا ع م م ت ي

يتمل دورهم في إجراء عمليات صيانة وتحديث. طالعهم في إبقاء النظام يعمل بشكل مستمر.



show platform fed <active|standby> لباقي "show platform fed switch <active|standby>". إذا  
ريغتم العودة إلى العمل، فإليك كيفية إعادة تشغيله.

## طالعهم



ةك بشلا اي جولو بوط

اي جولو بوط لاهذه في

- عم AnyCast (RP) عي مجتة طقنك اضيأ لمعتة عمجم دودح يه 10.47.1.11 و 10.47.1.10 ةك بشلا في ف ني نثالال ني ب (MSDP) ددعتم ل ثب ل رصم فاشتك لوكوتورب ةره اظلال (VN)/VRF.
- Fabric Edge دق ع يه 10.47.1.12 و 10.47.1.13
- ددعتم ل ثب ل رصم وه 10.47.7.2
- ددعتم ل ثب ل لبقتسم وه 10.47.7.3
- (GDA) ددعتم ل ثب ل ةعومجم ةهجو ناوع وه 239.1.1.1

## نيوكتلا

ريصقتلا عم انا ب SDA لادوزي نا زكرم تلمعتسا ةزافح ةدام cisco نا ضررت في دادع اةيلمع

- ثب لاولا بقتسالا ةدحوخسن وه لثامتم ل ا خسنلا ذي فنت
- ةدي دش دودح ل ا ل ع multicast (ASM) multicast رصم ي ا ل MSDP عم AnyCast RP ع قووملا

ةدع ل ا ل زاهج ل ل ةلصلال و ذ نيوكتلا يوتحي، Catalyst زكرم نم حج ان نيوكت دعب اماسقأ

Fabric Edge (10.47.1.12) نيوكت

---

```
ip multicast-routing vrf blue_vn
ip multicast vrf blue_vn multipath
!
interface LISP0.4100
vrf forwarding blue_vn
ip pim sparse-mode
end
!
interface Loopback4100
vrf forwarding blue_vn
ip address 10.47.6.4 255.255.255.255
ip pim sparse-mode
end
!
ip pim vrf blue_vn register-source Loopback4100
ip pim vrf blue_vn rp-address 10.47.6.1 ASM_ACL_IPV4_blue_vn_10.47.6.1
!
interface Vlan1025
description Configured from Cisco DNA-Center
mac-address 0000.0c9f.fb87
vrf forwarding blue_vn
ip address 10.47.7.1 255.255.255.0
ip helper-address 10.47.9.9
no ip redirects
ip pim passive
ip route-cache same-interface
ip igmp version 3
ip igmp explicit-tracking
no lisp mobility liveness test
lisp mobility blue-IPV4
end
!
ip access-list standard ASM_ACL_IPV4_blue_vn_10.47.6.1
10 permit 239.0.0.0 0.255.255.255
```

### نيوكت Fabric Edge (10.47.1.13)

```
ip multicast-routing vrf blue_vn
ip multicast vrf blue_vn multipath
!
interface LISP0.4100
vrf forwarding blue_vn
ip pim sparse-mode
end
!
interface Loopback4100
vrf forwarding blue_vn
ip address 10.47.6.4 255.255.255.255
ip pim sparse-mode
end
!
ip pim vrf blue_vn register-source Loopback4100
ip pim vrf blue_vn rp-address 10.47.6.1 ASM_ACL_IPV4_blue_vn_10.47.6.1
!
interface Vlan1025
```

---

---

```
description Configured from Cisco DNA-Center
mac-address 0000.0c9f.fb87
vrf forwarding blue_vn
ip address 10.47.7.1 255.255.255.0
ip helper-address 10.47.9.9
no ip redirects
ip pim passive
ip route-cache same-interface
ip igmp version 3
ip igmp explicit-tracking
no lisp mobility liveness test
lisp mobility blue-IPV4
end
!
ip access-list standard ASM_ACL_IPV4_blue_vn_10.47.6.1
10 permit 239.0.0.0 0.255.255.255
```

### دودج نيوكت /AnyCast RP (10.47.1.10)

```
router bgp 69420
address-family ipv4 vrf blue_vn
aggregate-address 10.47.6.0 255.255.255.0 summary-only
!
router lisp
site site_uci
eid-record instance-id 4100 10.47.6.0/24 accept-more-specifics
!
ip multicast-routing vrf blue_vn
ip multicast vrf blue_vn multipath
!
interface LISP0.4100
vrf forwarding blue_vn
ip pim sparse-mode
end
!
interface Loopback4100
vrf forwarding blue_vn
ip address 10.47.6.1 255.255.255.255
ip pim sparse-mode
end
!
interface Loopback4600
vrf forwarding blue_vn
ip address 10.47.6.6 255.255.255.255
ip pim sparse-mode
end
!
ip pim vrf blue_vn rp-address 10.47.6.1 ASM_ACL_IPV4_blue_vn_10.47.6.1
ip pim vrf blue_vn register-source Loopback4100
!
ip access-list standard ASM_ACL_IPV4_blue_vn_10.47.6.1
10 permit 239.0.0.0 0.255.255.255
!
ip msdp vrf blue_vn peer 10.47.6.7 connect-source Loopback4600
ip msdp vrf blue_vn cache-sa-state
ip msdp vrf blue_vn originator-id Loopback4600
```

---

## دودح نڤوكت /AnyCast RP (10.47.1.11)

```
router bgp 69420
address-family ipv4 vrf blue_vn
aggregate-address 10.47.6.0 255.255.255.0 summary-only
!
router lisp
site site_uci
eid-record instance-id 4100 10.47.6.0/24 accept-more-specifics
!
ip multicast-routing vrf blue_vn
ip multicast vrf blue_vn multipath
!
interface LISP0.4100
vrf forwarding blue_vn
ip pim sparse-mode
end
!
interface Loopback4100
vrf forwarding blue_vn
ip address 10.47.6.1 255.255.255.255
ip pim sparse-mode
end
!
interface Loopback4600
vrf forwarding blue_vn
ip address 10.47.6.7 255.255.255.255
ip pim sparse-mode
end
!
ip pim vrf blue_vn rp-address 10.47.6.1 ASM_ACL_IPV4__blue_vn_10.47.6.1
ip pim vrf blue_vn register-source Loopback4100
!
ip access-list standard ASM_ACL_IPV4_blue_vn_10.47.6.1
10 permit 239.0.0.0 0.255.255.255
!
ip msdp vrf blue_vn peer 10.47.6.6 connect-source Loopback4600
ip msdp vrf blue_vn cache-sa-state
ip msdp vrf blue_vn originator-id Loopback4600
```

## مكحتال يوتسم نم ققحتال

PIM و (IGMP) تنرتن إالة ومجم ةيوضع لوكوتورب، كلذ دع

IGMP ةيوضع ريرقت ددعتمال ثبال لبقتسم لسري

مامضنا وأ (MR) IGMP ةيوضع ريرقت (10.47.7.3) ددعتمال ثبال لبقتسم لسري  
طاقتال نڤوكت كنكمي. ددعتمال ثبال رورم ةكرح يقلتب مامتةال الة راشال IGMP  
:ةيقلت مت IGMP MR دوجو ديأتل (EPC) ةنمضم ةمزح

---

<#root>

Edge-2#

```
monitor capture 1 interface GigabitEthernet1/0/5 IN
```

Edge-2#

```
monitor capture 1 match any
```

Edge-2#

```
monitor capture 1 buffer size 10
```

Edge-2#

```
monitor capture 1 start
```

Edge-2#

```
monitor capture 1 stop
```

Edge-1#

```
show monitor capture 1 buff display-filter igmp brief
```

Starting the packet display ..... Press Ctrl + Shift + 6 to exit

```
145 63.730527 10.47.7.4 -> 239.1.1.1 IGMPv2 60 Membership Report group 239.1.1.1
```

كشور (DR) PIM لبق نم نيعملا هجوملا يه ةينبلا ةفاح نا نم دكأت، كلذ دعب ةوطخل هجوم مساب اضيأ هيلإ راشي و. اهيف دوجوم ددعتملا ثبلا لبق تسم نا أو VLAN ةريخألا (LHR). ةريخألا show ip pim vrf <vn name> interface vlan <vlan> detail | i PIM DR" نيمضت

<#root>

Edge-2#

```
show ip pim vrf blue_vn interface vlan 1025 detail | i PIM DR
```

```
PIM DR: 10.47.7.1 (this system)
```

show ip igmp vrf <vn name> snooping group" طقتلا دق IGMP MR مادختساب IGMP MR طقتلا دق IGMP MR مادختساب

<#root>

---



---

Edge-1#

```
show ip igmp vrf blue_vn snooping groups
```

```
Vlan Group          Type Version Port List
```

```
-----  
1025 239.255.255.254 igmp v2      Gi1/0/5
```

## PIM Join to AnyCast RP. ل رثن ل عضو ي ف ة كرتش م ل ا ة رجش ل ا عاش ن ا

Edge-2، وهو DR ل كل ذ ي ف AnyCast RP. ل ح م ت ي م ل ا ذ ا. ل س ر ي ة ز ج ل ا ل ذ ي ف DR، وهو LISP، ة ط ي ر خ ل ت ق و م ل ا ن ي ر خ ت ل ا ة ك ا ذ ي ف AnyCast RP ن ا و ن ع ر م ا ل ا م ا د خ ت س ا ك ن ك م ي. LISP ة ط ي ر خ ت ا ب ل ط ل ي غ ش ت ن ع ة ل و و س م د ي ع ل ا ل ا ل خ LISP RLOC" ا د ب | show lisp instance-id <LISP L3 IID> IPv4/IPv6 eid-watch

```
<#root>
```

Edge-2#

```
show lisp instance-id 4100 ipv4 eid-watch | begin RLOC
```

```
LISP IPv4 EID Watches for Table (RLOC mapping in vrf blue_vn IPv4) IID (4100), 1 watch entries  
Watch entries for prefix 10.47.6.1/32
```

```
10.47.6.1
```

```
,
```

```
multicast
```

Edge-2#

```
show lisp instance-id 4100 ipv4 map-cache 10.47.6.1
```

```
LISP IPv4 Mapping Cache for LISP 0 EID-table vrf blue_vn (IID 4100), 1 entries  
10.47.6.1/32, uptime: 9w1d, expires: 20:19:57, via map-reply, complete  
Sources: map-reply  
State: complete, last modified: 9w1d, map-source: 10.47.1.10  
Active, Packets out: 577721(21849998 bytes), counters are not accurate (~ 00:00:12 ago)  
Locator Uptime State Pri/Wgt Encap-IID
```

```
10.47.1.10
```

```
9w1d up 10/10 -
```

```
Last up-down state change: 1w1d, state change count: 3
```

```
Last route reachability change: 9w1d, state change count: 1
```

```
Last priority / weight change: never/never
```

```
RLOC-probing loc-status algorithm:
```

```
Last RLOC-probe sent: 1w1d (rtt 272ms)
```

```
10.47.1.11
```

```
9w1d up 10/10 -
```

---

---

Last up-down state change: 9w1d, state change count: 1  
Last route reachability change: 9w1d, state change count: 1  
Last priority / weight change: never/never  
RLOC-probing loc-status algorithm:  
Last RLOC-probe sent: 1w1d (rtt 602ms)

Edge-2#

```
show ip rpf vrf blue_vn 10.47.6.1
```

```
RPF information for (10.47.6.1)
RPF interface: LISP0.4100
RPF neighbor: ? (10.47.1.10)
RPF route/mask: 10.47.6.1/32
RPF type: unicast ()
Doing distance-preferred lookups across tables
Multicast Multipath enabled.
RPF topology: ipv4 multicast base
```

show ip mroute vrf <vn name>  
<multicast group>"

<#root>

Edge-2#

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,  
e - encap-helper tunnel flag, l - LISP decap ref count contributor  
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join  
t - LISP transit group  
Timers: Uptime/Expires  
Interface state: Interface, Next-Hop or VCD, State/Mode  
(\* , 239.1.1.1), 4d05h/00:02:12, RP

10.47.6.1

, flags: SC

<-- Anycast RP IP address 10.47.6.1

---

Incoming interface: LISP0.4100, RPF nbr

10.47.1.10 <-- Reverse Path Forwarding (RPF) neighbor to get to the Anycast RP IP

Outgoing interface list:

Vlan1025

, Forward/Sparse-Dense, 4d05h/00:02:12, flags:

<-- Outgoing interface list (OIL) is populated via PIM Join or IGMP Membership Report

## ةيشغتلل في PIM ناريج

ددحمب اهليثمت متي يتللا ةرواجملا (RPF) يسكعل راسملا هيحوت ةداعل ةفاضل درجمب متت، LISP ةهجاو ربع اهليل لوصولو نكميو (RLOC) اهب صاخلا هيحوتلا عقوم VRF/VN في PIM لوكوتوربل راجك اهتفاضل.

اهب ملع لىل ع نوكت نأ بجي ةديدع رومأ

- لاسرل اهماذختسا متي يذلاو، (RPF) يسكعل راسملا هيحوت ةداعل صحف لمعي اهاتنا تقوؤم اذختساب PIM راج عاشنل ليغشت لىل ع (\*،G) PIM لىل امامضنالا، ني تقوقد ةدمل PIM Join لئاسر لاسرلا متي مل اذا. ني تقوقد ةدمل ةيحالص رواجملا تقوللا يهتني سف.
- ثيح قفاوتملا RLOC ل حيرص لكشب ةرواجم ةينب عاشنل PIM موقبي نأ بجي SDA ةيشغت في PIM Hello لئاسر لاسرلا متي ال

<#root>

Edge-2#

```
show ip pim vrf blue_vn neighbor
```

PIM Neighbor Table

Mode: B - Bidir Capable, DR - Designated Router, N - Default DR Priority,

P - Proxy Capable, S - State Refresh Capable, G - GenID Capable,

L - DR Load-balancing Capable

Neighbor	Interface	Uptime/Expires	Ver	DR
----------	-----------	----------------	-----	----

Address				Prio/Mode
---------	--	--	--	-----------

10.47.1.10	LISP0.4100	4d23h/00:01:37	v2	0 /
------------	------------	----------------	----	-----

## إاشنل AnyCast RP (\*،G)

RLOC وحن تي زلا عم (\*،G) border-1 ةيشنل، Edge-2 نم لوصولو (\*،G) PIM لىل اذانتسا ةفاحل

<#root>

---

Border-1#

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,  
e - encap-helper tunnel flag, l - LISP decap ref count contributor  
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join  
t - LISP transit group  
Timers: Uptime/Expires  
Interface state: Interface, Next-Hop or VCD, State/Mode  
(\*, 239.1.1.1), 4d23h/00:02:48, RP 10.47.6.1, flags: S  
Incoming interface: Null, RPF nbr 0.0.0.0  
Outgoing interface list:

LISP0.4100

,

10.47.1.13

, Forward/Sparse, 4d23h/00:02:33, flags:

<-- RLOC of Edge-2

## ددعتم ال ثب ال ردصم ليجست

Edge-1 عمجت يتلاو، ددعتم ال ثب ال رورم ةكح 10.47.7.2 ددعتم ال ثب ال ردصم لسري  
لجسي و (S.G) ةلا حءاشن ال ةيزك رمل ال ةجال عمل ال ةدحو يت ح ةمزحل برضب Edge-1 موقبي  
Edge-1 ال ردصم ال AnyCast RP.

<#root>

Edge-1#

```
monitor capture 1 interface GigabitEthernet1/0/4 IN
```

Edge-1#

```
monitor capture 1 match any
```

Edge-1#

```
monitor capture 1 buffer size 10
```

---

---

Edge-1#

monitor capture 1 start

Edge-1#

monitor capture 1 stop

Edge-1#

show monitor capture 1 buffer brief

Starting the packet display ..... Press Ctrl + Shift + 6 to exit

```
1 0.000000 10.47.7.2 -> 239.1.1.1 ICMP 98 Echo (ping) request id=0x0007, seq=107/27392, ttl=5
2 0.355071 10.47.7.3 -> 239.1.1.1 ICMP 98 Echo (ping) request id=0x0007, seq=107/27392, ttl=5
3 1.096757 10.47.7.3 -> 239.1.1.1 ICMP 98 Echo (ping) request id=0x0007, seq=108/27648, ttl=5
4 1.102425 10.47.7.3 -> 239.1.1.1 ICMP 98 Echo (ping) request id=0x0007, seq=108/27648, ttl=5
```

border-1 يدل نوكي، PIM ليحست ربع ددعت مل ا ثبل ا ةمزح border-1 ي قللت نأ درج ب  
MSDP ربع border-2 ي ل كلذ نع نال عال او (S,G)

<#root>

Border-1#

show ip mroute vrf blue\_vn 239.1.1.1 10.47.7.2

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, l - LISP decap ref count contributor

Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join  
t - LISP transit group

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode  
(10.47.7.2, 239.1.1.1), 00:02:26/00:00:34, flags: T

A <-- A flag indicates that this is a candidate for MSDP advertisement

Incoming interface: LISP0.4100, RPF nbr 10.47.1.12

Outgoing interface list:

LISP0.4100, 10.47.1.13, Forward/Sparse, 00:02:26/00:02:36, flags:

---

## MSDP ردصم نالعل

تقوؤم لانيخت لة ركاذ ضرعل "show ip msdp vrf <vn name> sa-cache" رمأل مدختسأ  
ردصم لة طشن لال show ip msdp vrf <vn name> رمأل تلمعتسا عيطتسي تنأ. ردم لة طشن لال  
ريظن MSDP لال يري نأ "ةصالخ

```
<#root>
```

```
Border-1#
```

```
show ip msdp vrf blue_vn sa-cache
```

```
MSDP Source-Active Cache - 1 entries
```

```
(10.47.7.2, 239.1.1.1), RP 10.47.6.7, BGP/AS 23456, 00:00:34/00:05:25, Peer 10.47.6.7
```

```
Border-1#
```

```
show ip msdp vrf blue_vn summary
```

```
MSDP Peer Status Summary
```

```
Peer Address AS      State Uptime/  Reset SA   Peer Name  
                               Downtime Count Count
```

```
10.47.6.7
```

```
23456
```

```
Up
```

```
1w1d      0      1
```

نمأل ةرازو نالعل قيرط نع Border-1 ةكرش نم (S,G) تامولعم يقلتت Border-2  
قلخي Border-2 نإف، Edge-2 نم مضمنا (\*،g) PIM يقلتت دق Border-2 ناك اذا. عافدل او  
ةدعاق لال Edge-2 ب صاخ لال RLOC لال ريشي يذلا (\*،G) نم LISP تيز شريو ءانمي (S,G)  
تامولعم ةدعاق ي ف طقف اهت ي ب ثت م تي MSDP SA تال اخذ نأ يه ةب رجت لال نع ةمجان لال  
ادوجوم (\*،G) ناك اذا (MRIB) ددعت مل ثبل لهي جوت.

```
<#root>
```

```
Border-2#
```

```
show ip msdp vrf blue_vn sa-cache
```

```
MSDP Source-Active Cache - 1 entries
```

```
(10.47.7.2, 239.1.1.1), RP 10.47.6.6, BGP/AS 23456, 00:13:59/00:03:28, Peer 10.47.6.6
```

```
Border-2#
```

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,  
e - encap-helper tunnel flag, l - LISP decap ref count contributor  
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join  
t - LISP transit group  
Timers: Uptime/Expires  
Interface state: Interface, Next-Hop or VCD, State/Mode  
(\* , 239.1.1.1), 00:21:04/00:00:06, RP 10.47.6.1, flags: SP  
Incoming interface: Null, RPF nbr 0.0.0.0

Outgoing interface list: Null <-- Indicates no PIM (\*,G) Join received, if there was an OIL, then

شبكة رورم كوك بديل 10.47.7.2 ردصم الى الى امامضنا (S,G) PIM border-1 لسري  
(S,G) تيز شيدحتب 1-Edge ل حمسي امم، يعيبط لكش ب ددعتم الى

<#root>

Edge-1#

show ip mroute vrf blue\_vn 239.1.1.1 10.47.7.3

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, l - LISP decap ref count contributor  
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join  
t - LISP transit group  
Timers: Uptime/Expires  
Interface state: Interface, Next-Hop or VCD, State/Mode  
(10.47.7.2, 239.1.1.1), 01:19:57/00:02:29, flags: FT  
Incoming interface:

---

```
vlan1025
, RPF nbr 0.0.0.0
<-- Multicast source 10.47.7.2 is in VLAN 1025
```

```
Outgoing interface list:
LISPO.4100,
10.47.1.10
, Forward/Sparse, 01:19:55/00:02:30, flags:
<-- RLOC of Border-1
```

10.47.6.6 نم 239.1.1.1 إلى 10.47.7.2 نم ددعت مل ثبل رورم ة كرح هيجوت ةداع| متت دي عي و، VXLAN رورم ة كرح border-1 جم دي. يداح أل ثبل VXLAN ني مضت ربع (border-1) Edge-2 (10.47.1.13) إلى اهل سبك

```
<#root>
```

```
Border-1#
```

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,
e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
t - LISP transit group
```

```
Timers: Uptime/Expires
```

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

```
(*, 239.1.1.1), 5d01h/00:03:14, RP 10.47.6.1, flags: S
```

```
Incoming interface: Null, RPF nbr 0.0.0.0
```

```
Outgoing interface list:
```

```
LISPO.4100, 10.47.1.13, Forward/Sparse, 5d01h/00:02:54, flags:
```

```
(
```

```
10.47.7.2
```

```
, 239.1.1.1), 00:02:28/00:00:30, flags: MT
```

```
<-- Unicast Source
```



---

```
Incoming interface: LISPO.4100, RPF nbr
10.47.1.12
<-- RPF neighbor to get to the source (Edge-1)
```

```
Outgoing interface list:
LISPO.4100,
10.47.1.13
, Forward/Sparse, 00:02:28/00:03:14, flags:
<-- RLOC of Edge-2
```

## رأس مالا ةرجش ل بيضق رصقاً (SPT)

ةرجش لوط لىلع ددعت مالا ثبلا ةمزح، Edge-2 (LHR) ةريخألا ةوطخلال ةجوم مالتسإ درجم ب  
Edge-1 لىلإ (S,G) PIM مامضنا لاسراو SPT عطق ءارج لواحى هنإف، (\*,G).

```
<#root>
```

```
Edge-2#
```

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,
e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
t - LISP transit group
```

```
Timers: Uptime/Expires
```

```
Interface state: Interface, Next-Hop or VCD, State/Mode
(*, 239.1.1.1), 4d23h/stopped, RP 10.47.6.1, flags: SJC
```

```
Incoming interface: LISPO.4100, RPF nbr 10.47.1.10
```

```
Outgoing interface list:
```

```
Vlan1025
```

```
, Forward/Sparse-Dense, 4d23h/00:02:40, flags:
```

```
<-- LHR creates the OIL because of receipt of an IGMP MR
```

---

---

```
(
10.47.7.2
, 239.1.1.1), 00:00:02/00:02:57, flags: JT
<-- Unicast Source

Incoming interface: LISP0.4100, RPF nbr
10.47.1.12
<-- RPF neighbor to get to 10.47.7.2, which is Edge-1 RLOC

Outgoing interface list:
Vlan1025
, Forward/Sparse-Dense, 00:00:02/00:02:57, flags:
<-- Multicast traffic is forwarded into VLAN 1025, where 10.47.7.3 is
```

Edge-2 ب صاخال RLOC وحن ةرشابم ريشي (S.G) لىل ع (Edge-1) FHR يوتحي

```
<#root>
```

```
Edge-1#
```

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,
e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
t - LISP transit group
```

```
Timers: Uptime/Expires
```

```
Interface state: Interface, Next-Hop or VCD, State/Mode
(*, 239.1.1.1), 5d01h/stopped, RP 10.47.6.1, flags: SCF
```

```
Incoming interface: LISP0.4100, RPF nbr 10.47.1.10
```

```
Outgoing interface list:
```

```
Vlan1025, Forward/Sparse-Dense, 5d01h/00:01:40, flags:
```

---

```
(
10.47.7.2
, 239.1.1.1), 01:53:06/00:02:42, flags: FT
<-- Unicast Source

Incoming interface: Vlan1025, RPF nbr 0.0.0.0
Outgoing interface list:
LISP0.4100,
10.47.1.13
, Forward/Sparse, 00:14:22/00:03:07, flags:
<-- Edge-2's RLOC
```

## مماظنللا نعل لقتسم) تانايبلا يوتسم نم ققحتلا (يساسالا

ثبلا لبقتسم وأ ددعتملا ثبلا روصم عنمي نأ فلتخم رادصا كانه نوكي نأ نكمي لكاشملا نم ققحتلا لعل مسقلا اذه زكري. رورملا كرح لابقتسا/الاسرا نم ددعتملا عم، ددعتملا ثبلا يقلتومو ددعتملا ثبلا روصم نم لك لعل رثوت نأ نكمي يتلا. ةزهجالا عمربب قلعتت ال يتلا اياضقلا لعل زيكرتلا.

### ردصملا بناج نم ققحتلا

نم ققحتلا، (S.G) ءاشنالا لعل FHR ةردقو ددعتملا ثبلا روصم ةحص نم ققحتلا ل Cisco نم عيرسلا هيحوتلا ةءاعا، LISP، ل وحملا لمكتملا نامالا ةزيم ةحص (RPF) يسكعلا راسملا هيحوت ةءاعا مث، (CEF).

ةيقب كرحي يذلا (IPDT) ةزهجالا عبتتلا ISF/IP ي ددعتملا ثبلا روصم نوكي نأ بجي RPF، فاطملا ةياهن يفو، CEF و LISP.

نأ نامضل "<ip address> show device-tracking database address" رمال مادختسا كنكمي. حلص IPDT لاخدا لعل يوتحي ددعتملا ثبلا روصم.

```
<#root>
```

```
Edge-1#
```

```
show device-tracking database address 10.47.7.2
```

```
Codes: L - Local, S - Static, ND - Neighbor Discovery, ARP - Address Resolution Protocol, DH4 - IP
Preflevel flags (prlvl):
0001:MAC and LLA match 0002:Orig trunk 0004:Orig access
0008:Orig trusted trunk 0010:Orig trusted access 0020:DHCP assigned
0040:Cga authenticated 0080:Cert authenticated 0100:Statically assigned
Network Layer Address Link Layer Address Interface vlan prlvl age state Time left
DH4 10.47.7.2 5254.0012.521d Gi1/0/4 1025 0024 163s REACHABLE 81 s try 0(8428
```

---

ثب ال ردم ل لاخدا لىل ع يوتحت FHR لىل ع LISP تانايب ةدعاق نا نم دكات ،كلذ دع ب  
"show lisp instance-id <LISP L3 IID> ipv4 database address/32" رمالا مدختسا .ددعتم ل

<#root>

Edge-1#

```
show lisp instance-id 4100 ipv4 database 10.47.7.2/32
```

```
LISP ETR IPv4 Mapping Database for LISP 0 EID-table vrf blue_vn (IID 4100), LSBs: 0x1
Entries total 1, no-route 0, inactive 0, do-not-register 1
10.47.7.3/32, dynamic-eid blue-IPV4, inherited from default locator-set rloc_691b1fe4-5264-44c2-b
Uptime: 1w2d, Last-change: 1w2d
Domain-ID: local
Service-Insertion: N/A
Locator Pri/Wgt Source State
10.47.1.13 10/10 cfg-intf site-self, reachable
Map-server Uptime ACK Domain-ID
10.47.1.10 1w2d Yes 0
10.47.1.11 1w2d Yes 0
```

Edge-1#

```
show ip lisp instance-id 4100 forwarding eid local 10.47.7.2
```

Prefix

10.47.7.2/32

س يلو ، فيضم /32 لاخدا لىل ريشي CEF ، لىل ع انا ب لاخدا عاشنا ب CEF موقت  
LISP.

<#root>

Edge-1#

```
show ip cef vrf blue_vn 10.47.7.2
```

```
10.47.7.2/32
nexthop 10.47.7.2 Vlan1025
```

CEF نم (RPF) يسكعلا راسملا هي جوت ةدعاق قاقتشا متي ، كلذ دع ب

<#root>

Edge-1#

---

---

```
show ip rpf vrf blue_vn 10.47.7.2
```

```
RPF information for (10.47.7.2)
```

```
RPF interface: Vlan1025
```

```
RPF neighbor: ? (
```

```
10.47.7.2
```

```
) - directly connected
```

```
RPF route/mask: 10.47.7.2/32
```

```
RPF type:
```

```
unicast (lisp)
```

```
Doing distance-preferred lookups across tables
```

```
Multicast Multipath enabled.
```

```
RPF topology: ipv4 multicast base, originated from ipv4 unicast base
```

تانايب ةدعاق نيي عت مدع هنع جتن ني امم، ISF/IPDT في حل اص لاخدا كانه نكي مل اذا  
ثبلا رصم ناك اذا. دودحل الى RPF و CEF هيجوت هنع جتن ني امم، FHR الى لISP  
جتني امم، ةححصلا ريغ ةهجاوالا الى تانايبلا رورم ةكرحل RPF طاقن لسري ددعتملا  
اهنيوكت متي ال (S,G)، RPF لشف هنع

```
<#root>
```

```
Edge-1#
```

```
show device-tracking database address 10.47.7.2
```

```
Codes: L - Local, S - Static, ND - Neighbor Discovery, ARP - Address Resolution Protocol, DH4 - I  
Preflevel flags (prlvl):
```

```
0001:MAC and LLA match 0002:Orig trunk 0004:Orig access
```

```
0008:Orig trusted trunk 0010:Orig trusted access 0020:DHCP assigned
```

```
0040:Cga authenticated 0080:Cert authenticated 0100:Statically assigned
```

```
Network Layer Address Link Layer Address Interface vlan prlvl age state Time left
```

```
Edge-1#
```

```
show lisp instance-id 4100 ipv4 database 10.47.7.2/32
```

```
% No database-mapping entry for 10.47.7.2/32.
```

```
Edge-1#
```

```
show ip cef vrf blue_vn 10.47.7.2
```

```
10.47.7.0/24
```

```
nexthop 10.47.1.10
```

```
LISP0.4100 <-- Result of a LISP Negative Map-Reply, so the LISP interface is now the RPF interface
```

```
nexthop 10.47.1.11
```

---

---

LISP0.4100 <-- Result of a LISP Negative Map-Reply, so the LISP interface is now the RPF interface

Edge-1#

```
show ip rpf vrf blue_vn 10.47.7.2
```

RPF information for (10.47.7.2)

RPF interface:

LISP0.4100

RPF neighbor: ? (

10.47.1.11

)

RPF route/mask: 10.47.7.2/32

RPF type: unicast ( )

Doing distance-preferred lookups across tables

Multicast Multipath enabled.

RPF topology: ipv4 multicast base

طبر بلغتي نأ نكمي شيح، تماص فيضمك ددعتملا ثبلل ردصم عم لماعت، اذه عنم ل  
ةل كشملا هذه لعل تباثلا ISF/IPDT و، تانااضي فالوا، هجوم ل IP.

## ردصملا ليجست

ةمزح يأل لم LISP/VXLAN مدختسي يذلاو، يداحلأا ثبلل ةمزح قفدت وه PIM ليجست  
FHR نأ نم ققحتلل ةبولطملا ققحتلا تاي لمع نم ديدعلا كانه. يداحلأا ثبلل رخأ  
AnyCast RP ليجست ل كشملا ثبلل ردصم ليجست نكمي.

GDA ليجست ل كشملا RP AnyCast نيوكت نم دكأت، الوأ

<#root>

Edge-1#

```
show ip pim vrf blue_vn rp 239.1.1.1
```

Group: 239.1.1.1, RP: 10.47.6.1, uptime 5d22h, expires never

PIM ليجست قفن نيوكت نم دكأت

<#root>

Edge-1#

---

---

```
show ip pim vrf blue_vn tunnel
```

```
Tunnel1
```

```
Type : PIM Encap
```

```
RP :
```

```
10.47.6.1 <-- This is from "ip pim vrf blue_vn rp-address 10.47.6.1 ASM_ACL_IPV4_blue_vn_10.47.6.1"
```

```
Source :
```

```
10.47.6.4 <-- This is from "ip pim vrf blue_vn register-source Loopback4100"
```

```
State : UP
```

```
Last event : Created (1w2d)
```

## AnyCast RP على IP على لوصولة فيناكم نامض

```
<#root>
```

```
Edge-1#
```

```
show ip cef vrf blue_vn 10.47.6.1
```

```
10.47.6.1/32
```

```
nexthop
```

```
10.47.1.10
```

```
LISPO.4100
```

```
<-- RLOC of Border-1
```

```
nexthop
```

```
10.47.1.11
```

```
LISPO.4100
```

```
<-- RLOC of Border-2
```

```
Edge-1#
```

```
ping vrf blue_vn 10.47.6.1 source lo4100
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.47.6.1, timeout is 2 seconds:
```

```
Packet sent with a source address of 10.47.6.4
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 257/275/294 ms
```

---

## لبقتسم لبا ن م ققحتلا

- IGMP MR لاسراب موقوي ددعتم لبا لباقتسم نأ ن م دكأت
- ن م ديحول ا عونل VNس طقف L2 IGMP لوكونورب يلعل لفظتلل نيكمت ن م دكأت نكمي IGMP لفظتي يقلتي ال نأ VN
- م كحتل ا عمئاق ، ذفنم لبا ةصاخلا لوصولا يف م كحتل ا عمئاق دوجو مدع ن م دكأت ذفنم لبا ةصاخلا لوصولا يف م كحتل ا عمئاق ، VLAN ةكبشل لوصولا يف IGMP MR طقس ت شحب اهنويوكت مت يتل ا هجومل
- لبقتسم ناك اذا ، IGMPv2 وه يضارثفا لكشب ، IGMP MR رادصا ن م ققحتلا "ip igmp version 3" ب لظتي كلذ نإف ، IGMPv3 وه ددعتم لبا لبا
- "ip option drop" نويوكت مدع ن م دكأت

## لبقتسم لبا ن م ققحتلا LHR PIM (\*،G)

- لبقتسم لبا صاخلا عطقم لبا/ةيعرفل ا ةكبش لل PIM DR وه LHR نأ ن م دكأت لبا
- "ip multicast group-range" نويوكت مدع ن م دكأت
- م كحتل ا عمئاق ، ذفنم لبا ةصاخلا لوصولا يف م كحتل ا عمئاق دوجو مدع ن م دكأت ذفنم لبا ةصاخلا لوصولا يف م كحتل ا عمئاق ، VLAN ةكبشل لوصولا يف IGMP MR طقس ت شحب اهنويوكت مت يتل ا هجومل
- م كحتل ا يوتسم م يظنت وأ ةيلاع (CPU) ةيزكرم ةجلاعم ةدحو دوجو مدع ن م دكأت IGMP MR لوكونورب طاقس ل (CoPP)

## LHR PIM ل ةكرتشم لبا ةرجش لبا ن م ققحتلا

ددعتم لبا لبا ةومجم ل RP نويوكت ن م دكأت لبا

```
<#root>
```

```
Edge-2#
```

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,
```

```
e - encap-helper tunnel flag, l - LISP decap ref count contributor
```

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

```
t - LISP transit group
```



---

Timers: Uptime/Expires  
Interface state: Interface, Next-Hop or VCD, State/Mode  
(\* , 239.1.1.1), 6d01h/stopped,

RP 10.47.6.1

, flags: SCF  
Incoming interface: LISP0.4100, RPF nbr 10.47.1.10  
Outgoing interface list:  
Vlan1025, Forward/Sparse-Dense, 6d01h/00:01:34, flags:

AnyCast RP إلى (RPF) يسكنه راسم ال هي جوت ةداع| ةحص نم دكأت

<#root>

Edge-2#

```
show ip cef vrf blue_vn 10.47.6.1
```

```
10.47.6.1/32  
nexthop 10.47.1.10 LISP0.4100  
nexthop 10.47.1.11 LISP0.4100
```

Edge-2#

```
show ip rpf vrf blue_vn 10.47.6.1
```

```
RPF information for (10.47.6.1)  
RPF interface: LISP0.4100  
RPF neighbor: ? (10.47.1.10)  
RPF route/mask: 10.47.6.1/32  
RPF type: unicast ()  
Doing distance-preferred lookups across tables  
Multicast Multipath enabled.  
RPF topology: ipv4 multicast base
```

ردصم ال بناج نم ققحت ال - MFIB هي جوت ةداع|

show ip mfib vrf <vn name> <multicast group> <unicast source> verbose" ةمزحل هي جوت ةداع| لوح يفاض| ةمولعم لصحي نأ

<#root>

Edge-1#

```
show ip mfib vrf blue_vn 239.1.1.1 10.47.7.2 verbose
```

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,  
e - Encap helper tunnel flag.  
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 blue\_vn  
(10.47.7.2,239.1.1.1) Flags: K HW DDE  
0x42 OIF-IC count: 0, OIF-A count: 1  
SW Forwarding: 0/0/0/0, Other: 272/272/0  
HW Forwarding: 7431223059161284608/0/0/0, Other: 0/0/0  
Vlan1025 Flags: RA A MA NS  
LISP0.4100,

10.47.1.13

Flags: RF F NS

<-- RLOC of Edge-2

CEF: Adjacency with MAC: 4500000000004000001164770A2F010D0A2F010C000012B5000000000840000000100400

Pkts: 0/0/0 Rate: 0 pps

Edge-1#

show adjacency lisp0.4100

Protocol Interface Address  
IP LISP0.4100 10.47.1.10(23)  
IP LISP0.4100 10.47.1.11(27)  
IP LISP0.4100

10.47.1.13

(8)

Edge-2#

show adjacency lisp0.4100 10.47.1.13 detail

Protocol Interface Address  
IP LISP0.4100

10.47.1.13

(8)

0 packets, 0 bytes  
epoch 0  
sourced in sev-epoch 14  
Encap length 50  
4500000000004000001164770A2F010D

---

---

```
0A2F010C000012B50000000008400000
00100400BA25CDF4AD3852540017FE73
0000
L2 destination address byte offset 0
L2 destination address byte length 0
Link-type after encap: ip
LISP
Next chain element:

IP adj out of GigabitEthernet1/0/1
, addr 10.47.1.6
```

ددعت مل ثب لة مزحل VXLAN ن م ضت نم ق قحت ل ل EPC مادخت سا ن كم ي

<#root>

```
Edge-1#monitor capture 1 interface GigabitEthernet1/0/4 IN
Edge-1#monitor capture 1 interface GigabitEthernet1/0/1 OUT
Edge-1#monitor capture 1 match any
Edge-1#monitor capture 1 buffer size 10
Edge-1#monitor capture 1 limit pps 1000
Edge-1#monitor capture 1 start
Edge-1#monitor capture 1 stop
```

Edge-1#

```
show monitor capture 1 buffer brief
```

```
Starting the packet display ..... Press Ctrl + Shift + 6 to exit
```

```
1 0.000000 10.47.7.2 -> 239.1.1.1 ICMP 98 Echo (ping) request id=0x0008, seq=28213/13678,
ttl=5 <-- Packet as it ingresses the FHR, TTL is 5
```

```
2 0.014254 10.47.7.2 -> 239.1.1.1 ICMP 148 Echo (ping) request id=0x0008, seq=28213/13678,
ttl=4 <-- Packet as it leaves the FHR, TTL is 4 as is it decremented
```

ل بق س مل بانج نم ق قحت ل ل - MFIB ه ي جوت ة داع ل

ه ي جوت مادخت سا ب Edge-2 ل ل Edge-1 نم ة مزحل هذه ه ي جوت ب ة ي عرف ل ة ك ب ش ل م وقت ي دا ح أ ل ث ب ل ل

<#root>

Edge-2#

```
show ip mroute vrf blue_vn 239.1.1.1 10.47.7.2
```

```
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, l - LISP decap ref count contributor  
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join  
t - LISP transit group  
Timers: Uptime/Expires  
Interface state: Interface, Next-Hop or VCD, State/Mode  
(

10.47.7.2

,

239.1.1.1

), 00:01:39/00:01:20, flags: JT  
Incoming interface: LISPO.4100, RPF nbr

10.47.1.12

Outgoing interface list:

Vlan1025

, Forward/Sparse-Dense, 00:01:39/00:02:45, flags:

مادخالتساب  
عز هأل هيجوت ةءاع ةءاءع ةءاي ز نم ءكأءل ا كن كم ي"،  
show ip mfib vrf <vn name> <group address> <unicast source>  
counters"

<#root>

Edge-2#

show ip mfib vrf blue\_vn 239.1.1.1 counters

Forwarding Counts: Pkt Count/Pkts per second/Avg Pkt Size/Kilobits per second  
Other counts: Total/RPF failed/Other drops(OIF-null, rate-limit etc)  
VRF blue\_vn  
12 routes, 7 (\*,G)s, 4 (\*,G/m)s  
Group: 239.1.1.1  
RP-tree,  
SW Forwarding: 0/0/0/0, Other: 0/0/0  
HW Forwarding: 0/0/2/0, Other: 0/0/0

---

Source: 10.47.7.2,  
SW Forwarding: 0/0/0/0, Other: 2/1/1  
HW Forwarding:

6118996613340856320

/0/0/0, Other: 0/0/0  
Totals - Source count: 1, Packet count:

6118996613340856320

Edge-2#

```
show ip igmp snooping groups vlan 1025 239.1.1.1
```

```
Vlan Group      Type Version Port List
```

```
-----  
1025 239.1.1.1 igmp v2      Gi1/0/4
```

multicast counters لـ multicast الـ واذ ا م ق ق ح ت ي ن ا ج ر خ م ت ل م ع ت س ا ع ي ط ت س ي ت ن ا  
show controllers ethernet-controller <interface> | لاس رال ا ا د د ع ت م ل ا ث ب ل ا ن ي م ض ت | ل LHR، ل ت ك ر ت ر و ر م ة ك ر ح  
الـ اس رال ا ا د د ع ت م ل ا ث ب ل ا ن ي م ض ت |

<#root>

Edge-2#

```
show controllers ethernet-controller g1/0/4 | include Multicast|Transmit  
Transmit
```

```
GigabitEthernet1/0/5      Receive
```

426729240 Total bytes

100803109 Total bytes

5732 Unicast frames

949355 Unicast frames

5732 Unicast bytes

93563018 Unicast bytes

4388433

Multicast frames

32346 Multicast frames

4388433

Multicast bytes

7236178 Multicast bytes

<snip>

Edge-2#

```
show controllers ethernet-controller g1/0/5 | include |Multicast|Transmit
```

Transmit

GigabitEthernet1/0/5  
426742895 Total bytes  
5733 Unicast frames  
5733 Unicast bytes

4388569

Multicast frames

4388569

Multicast bytes

Receive

100813570 Total bytes  
949456 Unicast frames  
93573016 Unicast bytes

32348 Multicast frames

7236641 Multicast bytes

EPC ذيفنت يه LHR كرت عم ددعتم لال ثبل رورم ةكرح ةحص نم ققحتل لى رخأ ةقيرط  
ددعتم لال ثبل لى بقتسم هاجت.

<#root>

Edge-2#

show monitor capture 1 buffer brief

Starting the packet display ..... Press Ctrl + Shift + 6 to exit

1 0.168401 10.47.7.2 -> 239.1.1.1 ICMP 106 Echo (ping) request id=0x0008, seq=35903/16268, ttl=3  
2 0.969138 10.47.7.2 -> 239.1.1.1 ICMP 106 Echo (ping) request id=0x0008, seq=35904/16524, ttl=3

(يساسأل ماظن لال بسح) تانايب لى وتسم نم ققحتل ل

ةيزكرم لال ةجلالعمل لال ةدحو ةاقتنا راسم - ءاشن ل (S,G)

in order for FHR لال نم لسري طبر multicast لال نم نانا لال ةلود (S,G) ققحي نال  
ةمئاق لى لال ددعتم لال ثبل مزح لال سرام تي MFIB ب جلالعي نال cpu لى تح لى ققحتي رقصم  
رابطنا FED "CPU\_Q\_MCAST\_DATA"

<#root>

Edge-1#

show platform software fed switch active punt cpuq 30

Punt CPU Q Statistics

=====

CPU Q Id : 30

CPU Q Name : CPU\_Q\_MCAST\_DATA

Packets received from ASIC : 27124

Send to IOSd total attempts : 27124

Send to IOSd failed count : 0  
RX suspend count : 0  
RX unsuspend count : 0  
RX unsuspend send count : 0  
RX unsuspend send failed count : 0  
RX consumed count : 0  
RX dropped count : 0  
RX non-active dropped count : 0  
RX conversion failure dropped : 0  
RX INTACK count : 0  
RX packets dq'd after intack : 0  
Active RxQ event : 0  
RX spurious interrupt : 0  
RX phy\_idb fetch failed: 0  
RX table\_id fetch failed: 0  
RX invalid punt cause: 0

Replenish Stats for all rxq:

-----  
Number of replenish : 0  
Number of replenish suspend : 0  
Number of replenish un-suspend : 0  
-----

ةيأل MCAST تانايبل CoPP راطت نا ةمئاق ضرعتت الأ ب جي ،كلذ لى ةفاضلإاب  
عضاوي لخداد show platform hardware fed active qos queue stats ةراسخ  
QId|ثبل تانايب ني م ضت | ةي زكرم لال ةجلال عم ل ةدحو تاسايس

<#root>

Edge-1#

show platform hardware fed active qos queue stats internal cpu policer | include MCAST Data|QId

QId	PlcIdx	Queue	Name	Enabled	Rate	Rate
30	9	MCAST	Data	No	500	400

راطت نا ةمئاق ةطساوب اهتجال عم متت ،ةرشابم لصتم روصم نم رورم لال ةكرح تتأ اذا  
نم ناك اذا "ةرشابم لصتم لال روصم لال" ل (LSMPI) Linux Shared Memory Punt Interface  
(S,G) Join، "Mcast PIM Signaling" هناف

show platform software infrastructure lsmpi punt | م ضت | mcast|بب س لال ني م ضت

<#root>

Edge-1#

```
show platform software infrastructure lsmapi punt | include Cause|Mcast
```

Cause	Total	Total	Length	Dot1q encap	Other
<b>Mcast Directly Connected Source</b>					
0					
27038					
0	0	0	0		
Mcast IPv4 Options data packet	0	0	0	0	0
Mcast Internal Copy	0	0	0	0	0
Mcast IGMP Unroutable	0	0	0	0	0
<b>Mcast PIM signaling</b>					
0	0	0	0	0	
Mcast punt to RP	0	0	0	0	0
Mcast UDLR	0	0	0	0	0

ردصملا نم ددعتملا ثبلا مزح طاقتلال FED ةمزح طاقتلال ءارجا نكمي، كلذ دع راطتنا ةمئاقو ةدراولا ةهجاولا دكؤت يتلاو، ةيزكرملا ةجالعمل ءدحو في ةومجملاو (CPU) ةيزكرملا ةجالعمل ءدحو.

```
<#root>
```

```
Edge-1#
```

```
debug platform software fed switch active punt packet-capture set-filter "ip.addr==239.1.1.1"
```

```
Edge-1#
```

```
debug platform software fed switch active punt packet-capture start
```

```
Edge-1#
```

```
debug platform software fed switch active punt packet-capture stop
```

```
Punt packet capturing stopped. Captured 2 packet(s)
```

```
Edge-1#
```

```
show platform software fed switch active punt packet-capture brief
```

```
Punt packet capturing: disabled. Buffer wrapping: disabled
```

```
Total captured so far: 2 packets. Capture capacity : 4096 packets
```

```
Capture filter : "ip.addr==239.255.255.254"
```

```
----- Punt Packet Number: 1, Timestamp: 2024/08/26 15:38:27.341 -----
```

```
interface : physical:
```

```
GigabitEthernet1/0/4
```

```
[if-id: 0x0000000c], pa1:
```

```
Vlan1025
```



```
[if-id: 0x0000001d]
metadata : cause: 12 [

Mcast Directly Connected Source

], sub-cause: 0, q-no: 30, linktype: MCP_LINK_TYPE_IP [1]
ether hdr : dest mac: 0100.5e7f.ffff, src mac: 5254.0012.521d
ether hdr : ethertype: 0x0800 (IPv4)
ipv4 hdr : dest ip:

239.1.1.1,

src ip: 10.47.7.2
ipv4 hdr : packet len: 84, ttl: 5, protocol: 1 (ICMP)
icmp hdr : icmp type: 8, code: 0
```

## مراجعة MROUTE Hardware - IOS MRoute

رأس موجه راسم ي أ ي ف مدخست يتال ة ينبل س فن (S,G) ةزهجال ة م ر ب مدخست و  
IOS لى FMAN RP لى FMAN FP، لى FED.

```
<#root>
```

```
Edge-1#
```

```
show ip mroute vrf blue_vn 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, # - iif-starg configured on rpf intf,
e - encap-helper tunnel flag, l - LISP decap ref count contributor
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
t - LISP transit group
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(*, 239.255.255.254), 00:08:29/stopped, RP
```

```
10.47.6.1
```

```
, flags: SCF
```

```
<-- Anycast RP address
```

---

Incoming interface: LISP0.4100, RPF nbr

10.47.1.10 <-- RLOC of Border-1

Outgoing interface list:

Vlan1025, Forward/Sparse-Dense, 00:08:29/00:00:30, flags:

(

10.47.7.2

,

239.1.1.1

), 00:08:28/00:02:54, flags: FT

<-- Unicast source

Incoming interface:

Vlan1025

, RPF nbr 0.0.0.0

<-- Multicast source is in VLAN 1025

Outgoing interface list:

LISP0.4100

,

10.47.1.13

, Forward/Sparse, 00:08:23/00:03:07, flags:

<-- Forwarding to Edge-2

## راسم الةزه أةجمر ب - IOS MFIB

ثب الة هيجوت ةداع| تامولعم ةدعاق |ل| ددعتم ال ثب الة تاراسم ةفاض| متت كلذ دعبو  
ةداع| |ل| (RIB) هيجوت ال تامولعم ةدعاق ةفاض| ةيفي ك هبشت يت ال او، (MFIB) ددعتم ال  
MFIB. وه ددعتم ال ثب الة لداعيو، Cisco (CEF) نم عيرس ال هيجوت ال

<#root>

Edge-1#

show ip mfib vrf blue\_vn 239.1.1.1 10.47.7.2 verbose

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,

---

---

```
e - Encap helper tunnel flag.
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 blue_vn
(
```

```
10.47.7.2,239.1.1.1
```

```
) Flags: K HW DDE
```

```
<-- Multicast source and GDA
```

```
0x21 OIF-IC count: 0, OIF-A count: 1
SW Forwarding: 0/0/0/0, Other: 2/2/0
HW Forwarding: 0/0/0/0, Other: 0/0/0
Vlan1025 Flags: RA A MA NS
```

```
LISP0.4100, 10.47.1.13
```

```
Flags: RF F NS
```

```
<-- RLOC of Edge-2 and the RPF interface to reach 10.47.1.13
```

```
CEF: Adjacency with MAC: 4500000000004000001164770A2F010D0A2F010C000012B5000000000840000000100400
Pkts: 0/0/0 Rate: 0 pps
```

## مراجعة MROUTE - RP MFIB

مراجعة ومجموع show platform software ip switch active r0 mfib vrf index <vrf index> <GDA/32>

```
<#root>
```

```
Edge-1#
```

```
show vrf detail blue_vn | inc Id
```

```
VRF blue_vn (
```

```
VRF Id = 2
```

```
); default RD <not set>; default VPNID <not set>
```

```
Edge-1#
```

```
show platform software ip switch active r0 mfib vrf index 2 group 239.1.1.1/32
```

```
Route flags:
```

```
S - Signal; C - Directly connected;
```

```
IA - Inherit A Flag; L - Local;
```

---

---

BR - Bidir route

\*,

239.1.1.1/32

--> OBJ\_INTF\_LIST (0x6b)

Obj id:

0x6b

, Flags: C

OM handle: 0x34803c47f0

Edge-2#

```
show platform software ip switch active r0 mfib vrf index 2 group address 239.1.1.1 10.47.7.2
```

Route flags:

S - Signal; C - Directly connected;

IA - Inherit A Flag; L - Local;

BR - Bidir route

239.1.1.1, 10.47.7.2/64

--> OBJ\_INTF\_LIST (0x21)

Obj id:

0x21

, Flags: unknown

OM handle: 0x34803c4088

## مراجعة MROUTE - FP MFIB

(AOM) نمازتم ريغ تانئاك ةرادا فرعم تاراسملا سفنل FMAN RP لادخا نمضتي،  
ةيفاضلا جماربالا ةحص نم ققحتلل اذه AOM فرعم مادختسا متيو.

ةومجم <vrf index> show platform software ip switch active f0 mfib vrf index <vrf index>  
<GDA/32>"

<#root>

Edge-1#

```
show platform software ip switch active f0 mfib vrf index 2 group 239.1.1.1/32
```

Route flags:

S - Signal; C - Directly connected;

IA - Inherit A Flag; L - Local;

BR - Bidir route

\*,

239.1.1.1/32

--> OBJ\_INTF\_LIST (0x6b)

Obj id:

---

```

0x6b
, Flags: C
aom id:

29154
, HW handle: (nil) (created)

Edge-1#
show platform software ip switch active f0 mfib vrf index 2 group address 239.1.1.1 10.47.7.2

Route flags:
S - Signal; C - Directly connected;
IA - Inherit A Flag; L - Local;
BR - Bidir route

239.1.1.1., 10.47.7.2/64
--> OBJ_INTF_LIST (0x21)
Obj id:

0x21
, Flags: unknown
aom id:

36933
, HW handle: (nil) (created)

```

## MROUTE تانئاك - MROUTE ةزهجأ ةجمررب

(S,G) و (\*,G) نم لك لةيصلأا تانئاكل او تانئاكل نم ققحت، AOM تافرع م اذختساب  
 show platform software object-manager switch active f0 object <aom id>" و show platform software object-manager  
 switch active f0 object <AOM id>parent"

IPv4\_mcast لودج ىل تانئاكل دحأ ريشي. نبيصلأا نينئاكل ىل ع راسم لك يوتحي  
 ةللاتل رمأوالا يف اهم اذختساب متي يتللاو، ةمئاق ىل رخال ريشي امنبي

```
<#root>
```

```
Edge-1#
```

```
show platform software object-manager switch active f0 object 29154
```

```
Object identifier: 29154
```

```
Description:
```

```
PREFIX 0.0.0.0 , 239.1.1.1/32
```

```
(Table id 2)
```

```
Obj type id: 72
```

```
Obj type:
```

---

**mroute-pfx**

Status:

Done

, Epoch: 0, Client data: 0xa3e23c48

Edge-1#

**show platform software object-manager switch active f0 object 29154 parents**

Object identifier: 26509

Description:

**ipv4\_mcast table 2 (blue\_vn**

**), vrf id 2**

Status: Done

Object identifier: 29153

Description:

**mlist 107**

Status:

Done

Edge-1#

**show platform software object-manager switch active f0 object 36933**

Object identifier: 36933

Description:

**PREFIX 10.47.7.2 , 239.1.1.164**

(Table id 2)

Obj type id: 72

Obj type:

**mroute-pfx**

Status:

Done

, Epoch: 0, Client data: 0xa413c928

Edge-1#

**show platform software object-manager switch active f0 object 36933 parents**

Object identifier: 26509

Description: **ipv4\_mcast table 2 (blue\_vn), vrf id 2**

Status:

Done

---

---

Object identifier: 47695

Description:

mlist 33

Status:

Done

## عمىاق اناىاك - MROUTE ةزهأ ةجمرب

ةرداصل اناىاق مئاق وةدراولا اناىاق مئاق نم لك نم جزم يه MLIST اناىاق  
show platform software mlist switch active f0 index <index>"

<#root>

This is for (\*,G)

Edge-1#

show platform software mlist switch active f0 index 107

Multicast List entries

OCE Flags:

NS - Negate Signalling; IC - Internal copy;

A - Accept; F - Forward;

OCE	Type	OCE Flags	Interface
-----	------	-----------	-----------

-----  
0xf8000171 OBJ\_ADJACENCY

A

LISP0.4100

<-- A Flag indicates an Incoming interface for (\*,G)

0xf80001d1 OBJ\_ADJACENCY NS,

F

Vlan1025

<-- F Flag indicates an Outgoing interface for (\*,G)

This is for (S,G)

Edge-1#

show platform software mlist switch active f0 index 33

Multicast List entries

OCE Flags:

---

---

NS - Negate Signalling; IC - Internal copy;

A - Accept; F - Forward;

OCE	Type	OCE Flags	Interface
-----	------	-----------	-----------

---

0x5c	OBJ_ADJACENCY	NS,	
------	---------------	-----	--

F

LISP0.4100

<-- F Flag indicates an Outgoing interface(s), for (S,G)

0xf80001d1 OBJ\_ADJACENCY

A

Vlan1025

<-- A Flag indicates an Incoming interface, for (S,G)

## FED MROUTE - ةزهجألا ةجرب راسم

show platform software fed switch active ip mfib vrf <vn name> <gda> <unicast source>"

<#root>

Edge-1#

show platform software fed switch active ip mfib vrf blue\_vn 239.1.1.1 10.47.7.2

Multicast (S,G) Information

VRF : 2

Source Address : 10.47.7.2

HTM Handler : 0x7f45d98c7728

SI Handler : 0x7f45d9a44a28

DI Handler : 0x7f45d9bcb2d8

REP RI handler : 0x7f45d97e7188

Flags :

Packet count : 0

State : 4

RPF :

Vlan1025 A

OIF :

Vlan1025 A

LISP0.4100 F NS

(Adj: 0x5c )

ددتم لا ثبلا رورم ةكرح ةلسبك ةيلمع لوح تامولعم ةباتكلا ةداعإ سرهف رفوي

---





---

ASIC#:0

RI:50

Rewrite\_type:AL\_RRM\_REWRITE\_IPV4\_VXLAN\_INNER\_IPV4\_ENCAP(110) Mapped\_rii:LVX\_L3\_ENCAP\_L2\_PAYLOAD  
Dst Mac: MAC Addr: ba:25:cd:f4:ad:38,

Src IP: 10.47.1.12 <-- RLOC of Edge-1

Dst IP: 10.47.1.13 <--

RLOC of Edge-2

IPv4 TTL: 0

LISP INSTANCEID: 0

L3IF LE Index: 49

ASIC#:1

RI:50

Rewrite\_type:AL\_RRM\_REWRITE\_IPV4\_VXLAN\_INNER\_IPV4\_ENCAP(110) Mapped\_rii:LVX\_L3\_ENCAP\_L2\_PAYLOAD  
Dst Mac: MAC Addr: ba:25:cd:f4:ad:38,

Src IP: 10.47.1.12 <-- RLOC of Edge-1

Dst IP: 10.47.1.13 <-- RLOC of Edge-2

IPv4 TTL: 0

LISP INSTANCEID: 0

L3IF LE Index: 49

show platform software fed switch active ip mfib vrf <vn name> <gda> <source>  
ق. قحت لا نم ديزمل ق باس لا رمألا نم RI لا ذخ، كلذ دع ب

<#root>

Edge-1#

show platform software fed switch active ip mfib vrf blue\_vn 239.1.1.1 10.47.7.2

Multicast (S,G) Information

VRF : 2

Source Address : 10.47.7.2

HTM Handler : 0x7f45d98c7728

SI Handler : 0x7f45d9a44a28

DI Handler : 0x7f45d9bcb2d8

REP RI handler : 0x7f45d97e7188

Flags :

Packet count : 0

State : 4

RPF :

---

---

```
Vlan1025 A
OIF :
Vlan1025 A
LISPO.4100 F NS

(Adj: 0x5c )
```

أرسلت show platform software fed switch active ip adj | destination  
rloc>"

```
<#root>
```

```
Edge-1#
```

```
show platform software fed switch active ip adj 10.47.1.12
```

```
IPV4 Adj entries
```

dest	if_name	dst_mac	si_hdl	ri_hdl	pd_flags	adj_id	Last-modified
10.47.1.12	LISPO.4100	4500.0000.0000	0x7f45d9a4a5e8	0x7f45d9a4a798	0x60		

```
0x5c
```

```
2024/08/21 16:18:58.948
```

```
<-- 0x5c matches the Adj in the previous command
```

نوكي طبير multicast لا شح يري نأ ةسرهف ةياغلا تقود عيطتسي تنأ LHR، لىل  
تلمعتسا عيطتسي تنأ (لابقتسا) لبق تسم multicast ل نوكي ي، لىل تلسرأ  
أرسلت show platform software fed switch active ip mfib vrf <vn name> <gda> <source>"

```
<#root>
```

```
Edge-2#
```

```
show platform software fed switch active ip mfib vrf blue_vn 239.1.1.1 10.47.7.2
```

```
Multicast (S,G) Information
```

```
VRF : 2
```

```
Source Address : 10.47.7.2
```

```
HTM Handler : 0x7f0efdad33a8
```

```
SI Handler : 0x7f0efdad2648
```

```
DI Handler : 0x7f0efdad7668
```

```
REP RI handler : 0x7f0efdad4858
```

```
Flags :
```

```
Packet count : 0
```

```
State : 4
```

```
RPF :
```

```
LISPO.4100 A
```

```
OIF :
```

---



---

stripSeg = 0  
copySeg = 0

=====

---

ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن م ة و مچ م ادخت ساب دن تسم ل ا اذ ه Cisco ت مچرت  
م ل ا ل ا اء ن ا ع مچ ي ف ن ي م دخت س م ل ل م عد ي و ت ح م م ي دقت ل ة ي ر ش ب ل و  
ا م ك ة ق ي ق د ن و ك ت ن ل ة ل ا ة مچرت ل ض ف ا ن ا ة ظ ح ا ل م ي ج ر ي . ة ص ا خ ل ا م ه ت غ ل ب  
Cisco ي ل خ ت . ف ر ت ح م مچرت م ا ه م د ق ي ي ت ل ا ة ي ف ا ر ت ح ا ل ا ة مچرت ل ا ع م ل ا ح ل ا و ه  
ي ل ا م اء ا د ع و ج ر ل ا ب ي ص و ت و ت ا مچرت ل ا ه ذ ه ة ق د ن ع ا ه ت ي ل و ئ س م Cisco  
Systems ( ر ف و ت م ط ب ا ر ل ا ) ي ل ص ا ل ا ي ز ي ل ج ن ا ل ا دن ت س م ل ا