

# في احوال ص او ARP ة قد عا ط خ ا فاش ك ت س ا SD ل و ص و ة ي ن ب

## تاي و ت ح م ل ا

ة م د ق م ل ا

ة ي س ا س ا ل ا ت ا ب ل ط ت م ل ا

ت ا ب ل ط ت م ل ا

ة م د خ ت س م ل ا ت ا ن و ك م ل ا

ط خ م ل ا

ي د ا ح ا ل ا ت ا ب ل ا ر ا س م ل ا ة ي ل و ا ل ا ة ل ا ح ا ل ا

ي و ت س م ل ا ي ل ا ع ي د ا ح ا ل ا ت ا ب ل ا ر ا س م ل ا ص ا خ ل ا ARP ب ل ط ل م ع ر ي س

ت ا ب ل ا ي د ا ح ا ل ا ر ا س م ل ا ARP ب ل ط ن م ق ق ح ت ل ا

Edge-1 (10.47.1.12)

10.47.1.10 و 10.47.1.11) ة م ح م ل ا (د و د ح ل ا) د و د ح ل ا

Edge-2 (10.47.1.13)

ي د ا ح ا ل ا ت ا ب ل ا ARP ر ا س م ل ا ع د ر ل ل ا ي و ت س م ل ا ي ل ا ع ل م ع ر ي س

ت ا ب ل ا ي د ا ح ا ل ا ر ا س م ل ا ARP د ر ن م ق ق ح ت ل ا

Edge-2 (10.47.1.13)

Edge-1 (10.47.1.12)

ر م غ ل ا (L2) ر م غ ر ا س م

ر م غ ل ا ر ا س م ل ا ARP ب ل ط ن م ق ق ح ت ل ا

Edge-1 (10.47.1.12)

Edge-2 (10.47.1.13)

ر م غ ل ا ر ا س م ل ا ARP د ر ة ح ص ن م ق ق ح ت ل ا

## ة م د ق م ل ا

ا ح ا ل ا ص ا و (ARP) ن ا و ن ع ل ا ل ي ل ح ت ل و ك و ت و ر ب ع ا ط خ ا ف ا ش ك ت س ا ة ي ف ي ك د ن ت س م ل ا ا ذ ه ح ص و ي  
SD ل و ص و ة ي ن ب ي

## ة ي س ا س ا ل ا ت ا ب ل ط ت م ل ا

### ت ا ب ل ط ت م ل ا

ة ي ل ا ت ل ا ع ي ض ا و م ل ا ب ة ف ر ع م ك ي د ل ن و ك ت ن ا ب Cisco ي ص و ت

- (IP) ت ن ر ت ن ا ل ل و ك و ت و ر ب ه ي ج و ت ة د ا ع |
- (LISP) ع ق و م ل ا د د ح م / ف ر ع م ل ا ل ص ف ل و ك و ت و ر ب
- (ARP) ن ا و ن ع ل ا ل ي ل ح ت ل و ك و ت و ر ب



# ي داحأل ثبلا راسمل ةيلوالا ةلجال

ههلا راشي ام ريشي. ةينبلا لخال ARP لجال ناتي سيئر ناتي قيرط كانه، SDA قاطن ي "Flood arp" صقن وأ (L2) ةقبطلل ARP رمغل نيوكت دجوي ال هنأ لىل ي داحأل ثبلا راسم مساب VLAN ةكبش عم قفاوتي يذلا (IID) ل L2 لىل ثم فرعم تحت هنيوكت مت يذلا "arp and IP" ل نيوكت دجوي ال، ي داحأل ثبلا ARP راسمل لهأتلل، ريذحتلا اذى لىل ةفاضل اب. ةينعمل طقف 3 ةقبطلل عمجل دجوي ال وأ "ARP" لىل حمل لىل كوجل

نأ ضررت في و اذى اءال صا و اءاخأل فاشك تسأ مسق عم عبات ف، تاهي بننتلا هذى ةببلا مت اذى صاخال ةيضا رتفال تارابع لىل لىل لصت نأ نكمي (10.47.4.2 و 10.47.4.3) ةياهن لىل تطقن الك 10.47.4.1 اهنأ لىل ةدوجومل Fabric Edge تالوحم لىل ةدوجومل اءب

```
<#root>
```

```
Edge-1#
```

```
ping vrf red_vn 10.47.4.2
```

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

```
Sending 5, 100-byte ICMP Echos to 10.47.4.2, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 257/292/344 ms
```

```
<#root>
```

```
Edge-2#
```

```
ping vrf red_vn 10.47.4.3
```


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

```
Sending 5, 100-byte ICMP Echos to 10.47.4.3, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 221/321/566 ms
```

---

 لوجمل لىل يئاهنللا فيضمل نم ةيضا رتفال ةبابل لاصتا رابتخاب صوي: جيملت ةئطاخل تاجات ننتسالا بنجل ةريدتسمل لىل ةيلوالا ةقيرطلاب سي لو، يفرطلا فيضمل زاهج لىل ةيامح رادج ةطساوب اءطاقسا متي يتل ICMP مزحب ةقلعتمل يفرطلا.

---

IP، زهجا بقعت لخال اءب ةصاخ ةياهن ةطقن اءل Fabric Edge ةدقع لك نأ نم ققحت، كلذ دعب L3 تانايب ةءعاو، L2 (AR) ناوئل ةقد تانايب ةءعاو، L2 (IPDT) تانايب ةءعاو (IPDT).

```
Edge-1:
```

```
show device-tracking database interface
```

```
<interface connected to endpoint>
```

```
<#root>
```

Edge-1#

show device-tracking database interface gi1/0/3

portDB has 2 entries for interface Gi1/0/3, 2 dynamic

Codes: L - Local, S - Static, ND - Neighbor Discovery, ARP - Address Resolution Protocol, DH4 - IPv4 DHCP

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	ag
-----------------------	--------------------	-----------	------	-------	----

DH4

10.47.4.2

5254.0019.93e9

Gi1/0/3	1026	0024	15s	REACHABLE	228 s try 0(6374 s)
---------	------	------	-----	-----------	---------------------

show lisp eid-table vlan <vlan id> ليدون نم MAC ناونوع و VLAN كيش مدختسأ <mac address> تنرثيإ تانايب ددعاق لISP L2، تانايب ددعاق يف ةيانهنلا ةطقن نم ققحتلل قباسل

<#root>

Edge-1#

show lisp eid-table vlan 1026 ethernet database 5254.0019.93e9

LISP ETR MAC Mapping Database for LISP 0 EID-table Vlan 1026 (IID 8190), LSBs: 0x1

Entries total 1, no-route 0, inactive 0, do-not-register 2

5254.0019.93e9/48, dynamic-eid Auto-L2-group-8190, inherited from default locator-set rloc\_222e1707-175

Uptime: 3w5d, Last-change: 3w5d

Domain-ID: local

Service-Insertion: N/A

Locator	Pri/Wgt	Source	State
10.47.1.12	10/10	cfg-intf	site-self, reachable <-- Edge-1's RLOC
Map-server	Uptime	ACK	Domain-ID
10.47.1.10	1w3d	Yes	0
10.47.1.11	3w5d	Yes	0

show lisp eid-table vlan <vlan-id> ليدون نم MAC ناونوع و VLAN كيش مدختسأ L2 AR تانايب ددعاق نأ نم ققحتلل قباسل

<#root>

Edge-1#

```
show lisp eid-table vlan 1026 ethernet database address-resolution 5254.0019.93e9
```

```
LISP ETR Address Resolution for LISP 0 EID-table Vlan 1026 (IID 8190)
(*) -> entry being deleted
```

```
Hardware Address          L3 InstID Host Address
```

```
5254.0019.93e9           4099 10.47.4.2/32 <-- Endpoint MAC address, LISP L3 IID, and IPv4 address, r
```

قبا س ل ل ر م أ ل ن م LISP L3 IID م د خ ت س أ ة ي ع ر ف ل ل ة ك ب ش ل ل ع ا ن ق / <IPv4 address> ت ا ن ا ي ب ة د ع ا ق IPv4 <L3 IID> show lisp instance-id ل ر م أ ل ن م د خ ت س أ ة ي ع ر ف ل ل ة ك ب ش ل ل ع ا ن ق / <IPv4 address> ت ا ن ا ي ب ة د ع ا ق IPv4 <L3 IID> show lisp instance-id

```
<#root>
```

```
Edge-1#
```

```
show lisp instance-id 4099 ipv4 database 10.47.4.2/32
```

```
LISP ETR IPv4 Mapping Database for LISP 0 EID-table vrf red_vn (IID 4099), LSBs: 0x1
Entries total 1, no-route 0, inactive 0, do-not-register 1
```

```
10.47.4.2/32
```

```
, dynamic-eid red-IPV4, inherited from default locator-set rloc_222e1707-175d-4019-a783-060404f8bc2f
Uptime: 3w5d, Last-change: 3w5d
Domain-ID: local
Service-Insertion: N/A
Locator      Pri/Wgt  Source      State
```

```
10.47.1.12
```

```
10/10  cfg-intf  site-self, reachable
```

```
<-- Edge-1's own RLOC
```

Map-server	Uptime	ACK	Domain-ID
10.47.1.10	1w0d	Yes	0
10.47.1.11	1w0d	Yes	0

```
Edge-2:
```

```
show device-tracking database interface g1/0/3
<interface connected to local endpoint>
```

```
<#root>
```

```
Edge-2#
```

```
show device-tracking database interface g1/0/3
```

```
portDB has 3 entries for interface Gi1/0/3, 3 dynamic
Codes: L - Local, S - Static, ND - Neighbor Discovery, ARP - Address Resolution Protocol, DHCP - IPv4 DHCP
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              prlv1              ag

DH4

10.47.4.3

5254.001e.ad00

Gi1/0/3    1026              0024              122s              REACHABLE    124 s try 0(5810 s)

show lisp eid-table vlan <vlan id> تظهر قائمة الـ LISP L2، مع عنوان الـ MAC ونوع الـ VLAN كإحدى الخيارات. يمكن أيضاً عرض قائمة الـ LISP L2 مع عنوان الـ MAC ونوع الـ VLAN كإحدى الخيارات. يمكن أيضاً عرض قائمة الـ LISP L2 مع عنوان الـ MAC ونوع الـ VLAN كإحدى الخيارات.

<#root>

Edge-2#

show lisp eid-table vlan 1026 ethernet database 5254.001e.ad00

LISP ETR MAC Mapping Database for LISP 0 EID-table Vlan 1026 (IID 8190), LSBs: 0x1  
 Entries total 1, no-route 0, inactive 0, do-not-register 2

5254.001e.ad00/48, dynamic-eid Auto-L2-group-8190, inherited from default locator-set rloc\_691b1fe4-526

Uptime: 3w5d, Last-change: 3w5d

Domain-ID: local

Service-Insertion: N/A

Locator	Pri/Wgt	Source	State
10.47.1.13	10/10	cfg-intf	site-self, reachable <-- Edge-2's RLOC
Map-server	Uptime	ACK	Domain-ID
10.47.1.10	1w2d	Yes	0
10.47.1.11	1w2d	Yes	0

show lisp eid-table vlan <vlan-id> تظهر قائمة الـ L2 AR مع عنوان الـ MAC ونوع الـ VLAN كإحدى الخيارات. يمكن أيضاً عرض قائمة الـ L2 AR مع عنوان الـ MAC ونوع الـ VLAN كإحدى الخيارات. يمكن أيضاً عرض قائمة الـ L2 AR مع عنوان الـ MAC ونوع الـ VLAN كإحدى الخيارات.

<#root>

Edge-2#

show lisp eid-table vlan 1026 ethernet database address-resolution 5254.001e.ad00

LISP ETR Address Resolution for LISP 0 EID-table Vlan 1026 (IID 8190)

(\*) -> entry being deleted

Hardware Address              L3 InstID Host Address

5254.001e.ad00

4099 10.47.4.3/32 <-- Endpoint MAC address, LISP L3 IID, and IPv4 address, r

قبحاق IPv4 <L3 IID> show lisp instance-id رمألأ مدخلسأ، LISP L3 تانايب ةدعاق نم ققحتلل  
قباسلأ رمألأ نم LISP L3 IID مدخلسأ ةيعرفلال ةكبشلال عانق/<IPv4 address> تانايب

<#root>

Edge-2#

show lisp instance-id 4099 ipv4 database 10.47.4.3/32

LISP ETR IPv4 Mapping Database for LISP 0 EID-table vrf ed\_vn (IID 4099), LSBs: 0x1  
Entries total 1, no-route 0, inactive 0, do-not-register 2

10.47.4.3/32

, dynamic-eid red-IPV4, inherited from default locator-set rloc\_691b1fe4-5264-44c2-bb1b-0903b3eb2c51  
Uptime: 1w0d, Last-change: 1w0d  
Domain-ID: local  
Service-Insertion: N/A  
Locator Pri/Wgt Source State

10.47.1.13

10/10 cfg-intf site-self, reachable

<-- Edge-2, RLOC

Map-server	Uptime	ACK	Domain-ID
10.47.1.10	1w0d	Yes	0
10.47.1.11	1w0d	Yes	0

ةكرتشم دودح:

نم لك لىل L3 و L2 AR و L2 LISP روظنم نم يلاثم لكشب ةياهنلل يتطقن ليجست متي  
ققحت، L2 LISP ةئف فرعم صالختسال (border-1 و border-2) ةينبال ي فم كحتل تايوتسم  
show vlan id <vlan id> رمألأ مدخلسا و ةينبال ةفاح ةدقع نم

<#root>

Edge-1#

show vlan id 1026

VLAN Name	Status	Ports
1026 red	active	

L2LI0:8190

, Gi1/0/3

<-- L2 LISP IID

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1026	enet	101026	1500	-	-	-	-	-	0	0

Remote SPAN VLAN

-----  
Disabled

Primary Secondary Type Ports  
-----

نم مداخل لا نم ققحتلل تنرثي إمداخ <L2 IID> show lisp instance-id رمأل ا يف L2 فرع م مدختسأ  
يناثل ا يوتسم ل نم LISP روظنم

<#root>

Border-1#

show lisp instance-id 8190 ethernet server

LISP Site Registration Information

\* = Some locators are down or unreachable

# = Some registrations are sourced by reliable transport

Site Name	Last Register	Up	Who Last Registered	Inst ID	EID Prefix
site_uci	never 1w3d	no yes#	--	8190	any-mac

10.47.1.12

:21038 8190

5254.0019.93e9/48 <-- RLOC of the FE node, EID prefix that was registered

1w2d yes#

10.47.1.13

:16056 8190

5254.001e.ad00/48 <-- RLOC of the FE node, EID prefix that was registered

تنرثي إمداخ ناوع ةقد <L2 IID> show lisp instance-id رمأل ا مدختسأ، L2 AR مداخل نم ققحتلل

<#root>

Border-1#

show lisp instance-id 8190 ethernet server address-resolution

Address-resolution data for router lisp 0 instance-id 8190



L3 InstID	Host Address	Hardware Address
4099	10.47.4.2/32	5254.0019.93e9 <-- L3 LISP IID, Endpoint IPv4 A
4099	10.47.4.3/32	5254.001e.ad00 <-- L3 LISP IID, Endpoint IPv4 A

show lisp instance-id <L3 IID> IPv4

<#root>

Border-1#

show lisp instance-id 4099 ipv4 server

LISP Site Registration Information

\* = Some locators are down or unreachable

# = Some registrations are sourced by reliable transport

Site Name	Last Register	Up	Who Last Registered	Inst ID	EID Prefix
site_uci	never	no	--	4099	0.0.0.0/0
	6d01h	yes#	10.47.1.11:22876	4099	8.8.8.8/32
	1w0d	yes#	10.47.1.10:21610	4099	10.47.2.4/30
	1w0d	yes#	10.47.1.11:22876	4099	10.47.2.12/30
	never	no	--	4099	10.47.4.0/24
	1w0d	yes#	10.47.1.12:21038	4099	10.47.4.2/32
	1w0d	yes#	10.47.1.13:16056	4099	10.47.4.3/32
	1w0d	yes#	10.47.1.11:22876	4099	10.47.6.0/24
	1w0d	yes#	10.47.1.11:22876	4099	10.47.7.0/24
	1w0d	yes#	10.47.1.11:22876	4099	10.47.9.8/29
	never	no	--	4099	10.47.10.0/24
	1w0d	yes#	10.47.1.13:16056	4099	10.47.10.2/32

AR، L2 و L3 والداخل ليجس التا ادخال ةزجوم تاظوف حم ىل ع مكحت التا ايوتسم يوتحت نوكت دق واهال صا وني لوجت م ال عال مع ال اءا خا فاشك ت سا دن ع ةديفم نوكت نا نكمي يتلاو تقوي فچيسن فاوح ةدع ةطساوب عقوقت م ريغ لكشب عال مع ال ليجست متي شي لمع ةقلح ادج ريصق.

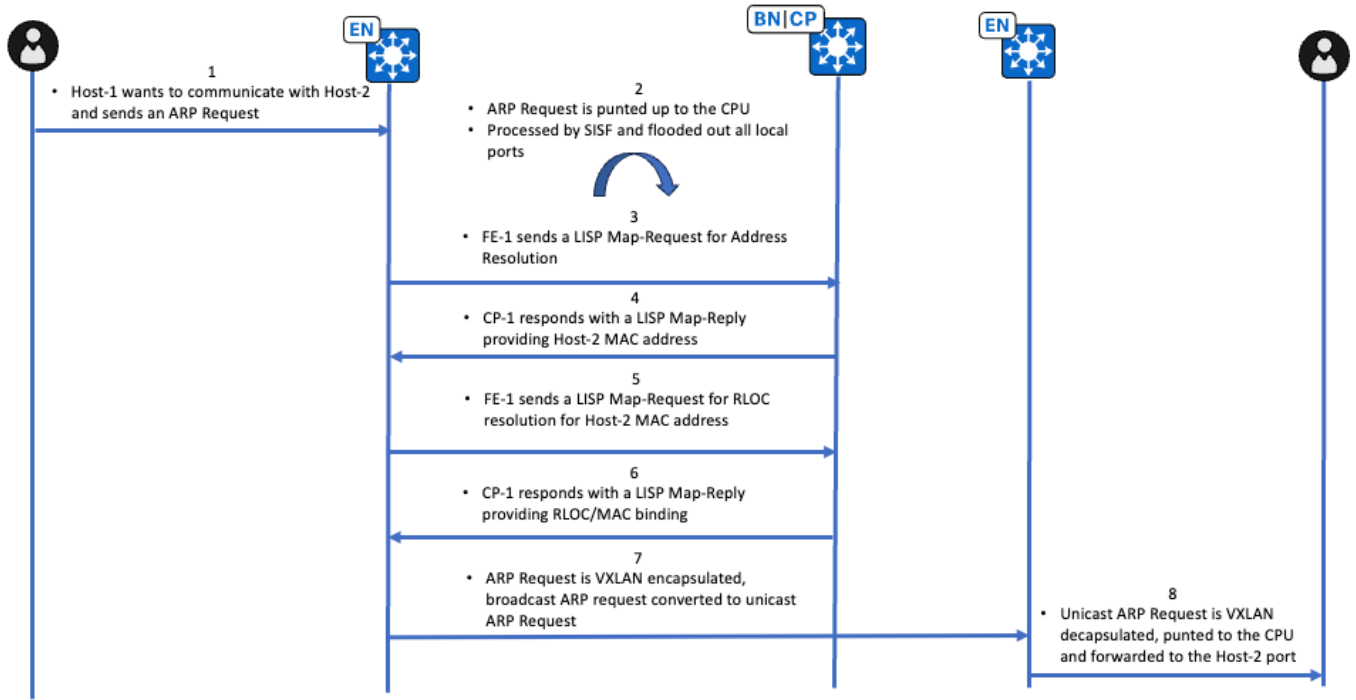
<#root>

Border-1#

show lisp instance-id 8190 ethernet server resolution registration-history | include Timestamp|10.47.4.2

Timestamp (UTC)	Instance	Proto	Roam	WLC	Source
*Oct 9 19:14:39.183	8190	TCP	No	No	10.47.1.12
					+*10.47.4.2/32 / 5254.0019.93e9 <-- Last registered at Oct 9
*Oct 9 19:14:41.183	8190	TCP	No	No	10.47.1.13
					+*10.47.4.3/32 / 5254.001e.ad00 <-- Last registered at Oct 9

# يلا ع يداأال اأبلا راس م ب صاأال ARP بلط لمع ريس يوسملا



## أبلا راس م ل ARP بلط نم ققأال

أاقأال ربع ديأأ، أبلا ARP بلط IP 10.47.4.2 ناوع كأمأ يأال ةأهاللا ةطقن لسرأ  
Edge-1 ل ع (EPC) نم ضم ةمزح

Edge-1 (10.47.1.12)

```
<#root>
```

```
Edge-1#
```

```
monitor capture 1 interface g1/0/3 in match any
```

```
Edge-1#
```

```
monitor capture 1 start
```

```
Edge-1#
```

```
monitor capture 1 stop
```

Capture statistics collected at software:

Capture duration - 39 seconds

Packets received - 21

Packets dropped - 0

Packets oversized - 0

Number of Bytes dropped at asic not collected

Capture buffer will exists till exported or cleared

Stopped capture point : 1

Edge-1#

show monitor capture 1 buffer brief

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

1 0.000000

52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP 60 Who has 10.47.4.3? Tell 10.47.4.

Edge-1#

show monitor capture 1 buffer detailed

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

Frame 1: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface /tmp/epc\_ws/wif\_to\_ts\_p

Interface id: 0 (/tmp/epc\_ws/wif\_to\_ts\_pipe)

Interface name: /tmp/epc\_ws/wif\_to\_ts\_pipe

Encapsulation type: Ethernet (1)

Arrival Time: Oct 19, 2023 23:43:31.893095000 UTC

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1697759011.893095000 seconds

[Time delta from previous captured frame: 0.000000000 seconds]

[Time delta from previous displayed frame: 0.000000000 seconds]

[Time since reference or first frame: 0.000000000 seconds]

Frame Number: 1

Frame Length: 60 bytes (480 bits)

Capture Length: 60 bytes (480 bits)

[Frame is marked: False]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:arp]

Ethernet II, Src: 52:54:00:19:93:e9 (

52:54:00:19:93:e9

), Dst: ff:ff:ff:ff:ff:ff (

ff:ff:ff:ff:ff:ff

)

Destination: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)

Address: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)

.... ..1. .... = LG bit: Locally administered address (this is NOT the factory d

.... ..1 .... = IG bit: Group address (multicast/broadcast)

Source: 52:54:00:19:93:e9 (52:54:00:19:93:e9)

Address: 52:54:00:19:93:e9 (52:54:00:19:93:e9)

.... ..1. .... = LG bit: Locally administered address (this is NOT the factory d

.... ..0 .... = IG bit: Individual address (unicast)

Type: ARP (0x0806)

Padding: 00000000000000000000000000000000

Address Resolution Protocol (request)

Hardware type: Ethernet (1)

Protocol type: IPv4 (0x0800)

Hardware size: 6

Protocol size: 4

Opcode: request (1)





Edge-1#

```
debug platform software infrastructure punt
```

```
*Oct 20 00:07:01.509: PUNT RX: mcprp_process_receive_packet: pak->vlan_id: 1026
```

```
*Oct 20 00:07:01.509: Punt: IP proto src 147.233.
```

```
10.47
```

```
, dst
```

```
4.2
```


```
.0.0, from table 0, intf Gi1/0/3, encap ARPA, size 60, cause snoop packets(L3)
```

```
<-- The IP address is obscured, but it is 10.47.4.2
```

```
*Oct 20 00:07:01.509: punt cause:snoop packets invoking reg_invoke_mcprp_punt_feature_msg
```

```
*Oct 20 00:07:01.509: punt cause:snoop packets MCPRP_PUNT_PAK_PROC_OK_DONE
```

---

 رذحب مادختسالا، ةرثرثلا وه اذه ءاطخألا حيحصت: ريذحت

---

ىل عف ل فطتلا يتي لمع ىل ةمزحلا ملست اهنإف، ةمزحلا ةجالع مبعي مجتلا ةمدخ موقت نأ دعب لوكوتورب ىل عف ل فطتلا لودج يف لاخدا ءاشنإ ىل ي دؤي اذهو. Proto SNOOP و Proto ARP. debug arp، ك ل ذ ةي ؤرل. ISF/ ةزهجال بقعت ىل ةمزحلا لاسرا متي و (ARP) نيوانعلا ليلحت عي مجل ءاطخألا حيحصت ةصنم ىل ةفاضل اب

<#root>

Edge-1#

```
debug arp
```

Edge-1#

```
debug platform fhs all
```

```
*Oct 20 00:12:06.908:
```

```
ARP packet received from ARP snoopers(Gi1/0/3 10.47.4.2 (5254.0019.93e9) VLAN:1026)
```

---

 رذحب مدختسا، ةشدر ن ع ةرابع ءاطخألا هذه: ريذحت

---

ب لطل ثدحي ام ىل عف ل طاللا show platform arpsnooping client <MAC address> رمألا مدختسا ARP

<#root>

Edge-1#

```
show platform arpsnooping client 5254.0019.93e9
```

```
PLAT_DAI      : Platform DAI shim  
FWDPLANE     : Dataplane forwarding  
BRIDGE       : Packet to be bridged  
ARPSN        : Arp Snooping  
Packet Trace for client MAC 5254.0019.93E9:
```

Timestamp	Sender Mac	Sender IP	Target Mac	Target IP	Opcode
2023/10/24 14:37:15.045	5254.0019.93e9	10.47.4.2	0000.0000.0000	10.47.4.3	ARP_REQUEST
2023/10/24 14:37:15.045	5254.0019.93e9	10.47.4.2	0000.0000.0000	10.47.4.3	ARP_REQUEST
2023/10/24 14:37:15.045	5254.0019.93e9	10.47.4.2	0000.0000.0000	10.47.4.3	ARP_REQUEST

```
INJECT:BD_DPIDX_TO_FWDPLANE
```

الادخال لشيء من ARP بل ط تايوتحم نم ققحتي هن اف، عمزحل اة جلاع م ب IPDT/SIF موق ي امن ي ب  
LISP. ربع ل حل رظت ني امن ي ب اتقؤم

```
<#root>
```

```
Edge-1#
```

```
show device-tracking messages detailed 255 | i 5254.0019.93e9
```

```
[Tue Oct 24 14:37:12.000] VLAN 1026, From Gi1/0/3 seclvl [guard], MAC 5254.0019.93e9: ARP::REQ,  
[Tue Oct 24 14:37:13.000] VLAN 1026, From Gi1/0/3 seclvl [guard], MAC 5254.0019.93e9: ARP::REQ,
```

وحن ريشي لادخال كانه نأ ىرت كنأف اءاطخال احي حصت زهجا عبتت مدختست تنك اذا  
نع ملعتسي Gi1/0/3 فلخ دوجومل ا فيضمل ا نأ ينعي اذه لك. ةزهجالا بقعت ي ف 000.000.00fd  
فيضم نع مالعتسال اة لاج ي ف مئاد و ا) ة لاق تنا ة لاج ي ف وه ف، دع ب هلح متي مل فيضم  
ايس ارم ا ةرورض ل ا ب سيل اذه و، دوجوم ريشي

```
<#root>
```

```
Edge-1
```

```
#debug device-tracking
```

```
Device-tracking - General debugging is on  
*Oct 24 14:55:02.967: SISF[POL]: vlan 1026 matches vlan list on policy IPDT_POLICY for target Gi1/0/3  
*Oct 24 14:55:02.967: SISF[POL]: Found matching policy IPDT_POLICY for feature Device-tracking on Gi1/0/3  
*Oct 24 14:55:02.967: SISF[GLN]: Checking if ARP ownership can be taken by device-tracking  
*Oct 24 14:55:02.967: SISF[GLN]: Not an ARP reply, do not take over  
*Oct 24 14:55:02.967: SISF[POL]: Found matching policy LISP-AR-RELAY-VLAN for feature Address Resolution  
*Oct 24 14:55:02.967: SISF[MAC]:
```

```
Creating new MAC entry for 0000.0000.00fd on interface          if none exists
```

```
*Oct 24 14:55:02.967: SISF[MAC]: Number of MAC entries in MAC-CREATING state incremented to 1  
*Oct 24 14:55:02.968: SISF[BT ]: Attaching 0000.0000.00fd entry in MacAdrDB for 10.47.4.3  
*Oct 24 14:55:02.968: SISF[GLN]: Binding entry event 1 for 10.47.4.3
```

LISP-AR-RELAY-VLAN. ةساي س ببسب LISP مادختساب ARP لي لحت لي غشتب SIF موقت  
رملال ي لوت نم LISP مكحت يوتسم في مكحت ال تايل مع نكمتت نأ دعب

```
<#root>
```

```
Edge-1#
```

```
debug lisp control-plane all
```

```
Edge-1#
```

```
debug l2lisp all
```

```
*Oct 24 15:10:27.677: LISP Client 'SISF client':
```

```
SISF request to resolve 10.47.4.3 in Vlan 1026.
```

Edge-1 لسري LISP Control-  
Plane (يوتسم) لال خ نم 10.47.4.3 ب صاخ ال MAC ناوع ل حل LISP ةطي رخ بل ط Edge-1 لسري

```
<#root>
```

```
Edge-1#
```

```
debug lisp control-plane all
```

```
Edge-1#
```

```
debug l2lisp all
```

```
*Oct 24 15:10:27.681: LISP[REMT ]-0: Map Request: Delay is over for IID 8190 EID 10.47.4.3/32, requester
```

```
*Oct 24 15:10:27.681: LISP[REMT ]-0 IID 8190: Schedule processing of Map-Requests from 'remote EID pref
```

```
*Oct 24 15:10:27.681: LISP[REMT ]-0: Map Request:
```

```
Sending request for IID 8190 EID 10.47.4.3/32, requester 'AR'.
```

ةجال عمل اةدحو ةطساوب متي يذال (EPC) هاجت ال اي ئانث ةنمضم ال ةمزح ال طاقت ال حضوي  
قجال ال LISP ةطي رخ بل طو دراوال ARP بل ط Edge-1 في (مكحت ال يوتسم) ةيزك رملال

```
<#root>
```

```
Edge-1#
```

```
monitor capture 1 control-plane both match any
```

```
Edge-1#
```

```
monitor capture 1 start
```

```
Started capture point : 1
```

```
Edge-1#
```



```
monitor capture 1 stop
```

```
Edge-1#
```

```
show monitor capture 1 buffer display-filter "arp.dst.proto_ipv4==10.47.4.3 or lisp"
```

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

```
60 10.110293 52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP 60 Who has 10.47.4.3? Tell 10.47.4.2
61 10.111714 10.47.4.3 -> 10.47.4.3 LISP 114 Encapsulated Map-Request for Unknown LCAF Type (5
```

LISP طيخ بلطل الي صفت رثكأ ضرع ذخأ كنكمي

```
<#root>
```

```
Edge-1#
```

```
show monitor capture 1 buffer display-filter "frame.number==61" detailed
```

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

```
Frame 61: 114 bytes on wire (912 bits), 114 bytes captured (912 bits) on interface /tmp/epc_ws/wif_to_t
```

```
Interface id: 0 (/tmp/epc_ws/wif_to_ts_pipe)
```

```
Interface name: /tmp/epc_ws/wif_to_ts_pipe
```

```
Encapsulation type: Ethernet (1)
```

```
Arrival Time: Oct 24, 2023 15:20:08.948469000 UTC
```

```
[Time shift for this packet: 0.000000000 seconds]
```

```
Epoch Time: 1698160808.948469000 seconds
```

```
[Time delta from previous captured frame: 0.001421000 seconds]
```

```
[Time delta from previous displayed frame: 0.000000000 seconds]
```

```
[Time since reference or first frame: 10.111714000 seconds]
```

```
Frame Number: 61
```

```
Frame Length: 114 bytes (912 bits)
```

```
Capture Length: 114 bytes (912 bits)
```

```
[Frame is marked: False]
```

```
[Frame is ignored: False]
```

```
[Protocols in frame: eth:ethertype:ip:udp:lisp:ip:udp:lisp]
```

```
Ethernet II, Src: 00:00:00:00:00:00 (
```

```
00:00:00:00:00:00
```

```
), Dst: 00:00:00:00:00:00 (
```

```
00:00:00:00:00:00
```

```
)
```

```
<-- Ignore the SMAC/DMAC this is done up at the CPU, not final MAC addresses
```

```
Destination: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
Address: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
.... ..0. .... = LG bit: Globally unique address (factory default)
```

```
.... ..0. .... = IG bit: Individual address (unicast)
```

```
Source: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
Address: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
.... ..0. .... = LG bit: Globally unique address (factory default)
```

```
.... ..0. .... = IG bit: Individual address (unicast)
```

```
Type: IPv4 (0x0800)
```

```
Internet Protocol Version 4,
```

Src: 10.47.1.12, Dst: 10.47.1.10 <-- Edge-1 RLOC and one of the collocated border RLOC, respectively

```
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
  1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)
  .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 100
Identification: 0x599c (22940)
Flags: 0x0000
  0... .... = Reserved bit: Not set
  .0.. .... = Don't fragment: Not set
  ..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0x4ab9 [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.1.12
Destination: 10.47.1.10
User Datagram Protocol, Src Port: 4342, Dst Port: 4342
Source Port: 4342
Destination Port: 4342
Length: 80
Checksum: 0x6393 [unverified]
[Checksum Status: Unverified]
[Stream index: 0]
[Timestamps]
  [Time since first frame: 0.000000000 seconds]
  [Time since previous frame: 0.000000000 seconds]
Locator/ID Separation Protocol
  1000 .... = Type: Encapsulated Control Message (8)
  .... 0... = S bit (LISP-SEC capable): Not set
  .... .0.. = D bit (DDT-originated): Not set
  .... ..00 0000 0000 0000 0000 0000 0000 = Reserved bits: 0x00000000
Internet Protocol Version 4,
Src: 10.47.4.3, Dst: 10.47.4.3
```

<-- MAP Request to resolve the MAC address tied to 10.47.4.3

```
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
  1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)
  .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 68
Identification: 0x599b (22939)
Flags: 0x0000
  0... .... = Reserved bit: Not set
  .0.. .... = Don't fragment: Not set
  ..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0x44ea [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.4.3
Destination: 10.47.4.3
User Datagram Protocol, Src Port: 4342, Dst Port: 4342
Source Port: 4342
Destination Port: 4342
```

```

Length: 48
Checksum: 0x9622 [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
[Timestamps]
  [Time since first frame: 0.000000000 seconds]
  [Time since previous frame: 0.000000000 seconds]
Locator/ID Separation Protocol
0001 ..... = Type: Map-Request (1)
.... 0000 00.. ..... = Flags: 0x00
.... 0... ..... = A bit (Authoritative): Not set
.... .0.. ..... = M bit (Map-Reply present): Not set
.... ..0. .... = P bit (Probe): Not set
.... ...0 ..... = S bit (Solicit-Map-Request): Not set
.... .... 0... ..... = p bit (Proxy ITR): Not set
.... ..... 0.. ..... = s bit (SMR-invoked): Not set
.... .... ..00 0000 000. .... = Reserved bits: 0x000
.... .... .... ..0 0000 = ITR-RLLOC Count: 0
Record Count: 1
Nonce: 0xcffee30fb39a05b7
Source EID AFI: Reserved (0)
Source EID: not set
ITR-RLLOC 1: 10.47.1.12
  ITR-RLLOC AFI: IPv4 (1)
  ITR-RLLOC Address: 10.47.1.12
Map-Request Record 1: Unknown LCAF Type (53)/32
  Reserved: 0x00
  Prefix Length: 32
  Prefix AFI: LISP Canonical Address Format (LCAF) (16387)
  Prefix: Unknown LCAF Type (53)
    LCAF: Unknown (53)
      LCAF Header: 00003520000a
        Reserved bits: 0x00
        Flags: 0x00
        Type: Unknown (53)
        Reserved bits: 0x20
        Length: 10
      [Expert Info (Error/Protocol): LCAF type 53 is not defined in draft-ietf-lisp-lcaf-05]
        [LCAF type 53 is not defined in draft-ietf-lisp-lcaf-05]
        [Severity level: Error]
        [Group: Protocol]

```

## دودج (دودج) (10.47.1.10 و 10.47.1.11) دودج

LISP طيرخ ىلع در مادختساب edge-1 لى لى LISP في م كحتال ىوتسم بيحتسي، كلذ دعب CPU EPC كلذكو عاخال احيصت في كلذ ةطحال منكمي و.

<#root>

Border-2#

show monitor capture 1 buffer display-filter lisp

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

```

113 12.767420 10.47.4.3 -> 10.47.4.3 LISP 114 Encapsulated Map-Request for Unknown LCAF Type (5
114 12.774428 10.47.1.11 -> 10.47.1.12 LISP 96 Map-Reply for Unknown LCAF Type (53)/32

```

ةطيرخ درو LISP ةطيرخ بلط ةدهاشم اننكمي ،ليصافتلا نم ديزمب مزحلا الى رظنن امنيب  
قحلال LISP

<#root>

Border-2#

show monitor capture 1 buffer display-filter frame.number==113 detailed

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

Frame 113: 114 bytes on wire (912 bits), 114 bytes captured (912 bits) on interface /tmp/epc\_ws/wif\_to\_

Interface id: 0 (/tmp/epc\_ws/wif\_to\_ts\_pipe)

Interface name: /tmp/epc\_ws/wif\_to\_ts\_pipe

Encapsulation type: Ethernet (1)

Arrival Time: Oct 24, 2023 15:41:06.566253000 UTC

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1698162066.566253000 seconds

[Time delta from previous captured frame: 0.013424000 seconds]

[Time delta from previous displayed frame: 0.000000000 seconds]

[Time since reference or first frame: 12.767420000 seconds]

Frame Number: 113

Frame Length: 114 bytes (912 bits)

Capture Length: 114 bytes (912 bits)

[Frame is marked: False]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:udp:lisp:ip:udp:lisp]

Ethernet II, Src: 52:54:00:04:84:a3 (

52:54:00:04:84:a3

), Dst: 52:54:00:1c:7d:e0 (

52:54:00:1c:7d:e0

)

<-- True MAC addresses

Destination: 52:54:00:1c:7d:e0 (52:54:00:1c:7d:e0)

Address: 52:54:00:1c:7d:e0 (52:54:00:1c:7d:e0)

.... ..1. .... = LG bit: Locally administered address (this is NOT the factory d

.... ..0 .... = IG bit: Individual address (unicast)

Source: 52:54:00:04:84:a3 (52:54:00:04:84:a3)

Address: 52:54:00:04:84:a3 (52:54:00:04:84:a3)

.... ..1. .... = LG bit: Locally administered address (this is NOT the factory d

.... ..0 .... = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4,

Src: 10.47.1.12, Dst: 10.47.1.11 <-- Edge-1 RLOC and Border-2 RLOC, respectively

0100 .... = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)

1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)

.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 100

Identification: 0x5e19 (24089)

Flags: 0x0000

```

    0... .. = Reserved bit: Not set
    .0.. .. = Don't fragment: Not set
    ..0. .. = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0x463b [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.1.12
Destination: 10.47.1.11
User Datagram Protocol, Src Port: 4342, Dst Port: 4342
Source Port: 4342
Destination Port: 4342
Length: 80
Checksum: 0x6392 [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
[Timestamps]
    [Time since first frame: 0.000000000 seconds]
    [Time since previous frame: 0.000000000 seconds]
Locator/ID Separation Protocol
1000 .... = Type: Encapsulated Control Message (8)
.... 0... .. = S bit (LISP-SEC capable): Not set
.... .0.. .. = D bit (DDT-originated): Not set
.... ..00 0000 0000 0000 0000 0000 0000 = Reserved bits: 0x00000000
Internet Protocol Version 4,
Src: 10.47.4.3, Dst: 10.47.4.3 <-- LISP MAP Request for 10.47.4.3

0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
    1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)
    .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 68
Identification: 0x5e18 (24088)
Flags: 0x0000
    0... .. = Reserved bit: Not set
    .0.. .. = Don't fragment: Not set
    ..0. .. = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0x406d [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.4.3
Destination: 10.47.4.3
User Datagram Protocol, Src Port: 4342, Dst Port: 4342
Source Port: 4342
Destination Port: 4342
Length: 48
Checksum: 0xe9a8 [unverified]
[Checksum Status: Unverified]
[Stream index: 2]
[Timestamps]
    [Time since first frame: 0.000000000 seconds]
    [Time since previous frame: 0.000000000 seconds]
Locator/ID Separation Protocol
0001 .... = Type: Map-Request (1)
.... 0000 00.. .. = Flags: 0x00
    .... 0... .. = A bit (Authoritative): Not set
    .... .0.. .. = M bit (Map-Reply present): Not set
    .... ..0. .. = P bit (Probe): Not set

```

```

.....0..... = S bit (Solicit-Map-Request): Not set
.....0... = p bit (Proxy ITR): Not set
.....0.. = s bit (SMR-invoked): Not set
.....0000000. = Reserved bits: 0x0000
.....00000 = ITR-RLLOC Count: 0
Record Count: 1
Nonce: 0x50c5f2b60b41ca1c
Source EID AFI: Reserved (0)
Source EID: not set
ITR-RLLOC 1: 10.47.1.12
  ITR-RLLOC AFI: IPv4 (1)
  ITR-RLLOC Address: 10.47.1.12
Map-Request Record 1: Unknown LCAF Type (53)/32
  Reserved: 0x00
  Prefix Length: 32
  Prefix AFI: LISP Canonical Address Format (LCAF) (16387)
  Prefix: Unknown LCAF Type (53)
    LCAF: Unknown (53)
      LCAF Header: 00003520000a
        Reserved bits: 0x00
        Flags: 0x00
        Type: Unknown (53)
        Reserved bits: 0x20
        Length: 10
      [Expert Info (Error/Protocol): LCAF type 53 is not defined in draft-ietf-lisp-lcaf-05]
      [LCAF type 53 is not defined in draft-ietf-lisp-lcaf-05]
      [Severity level: Error]
      [Group: Protocol]

```

رڤأ ةرم اهل اسرل م تي ي ت ل ل LISP ة ط ي ر خ ي ل ع د ر ل ا ي ل ع ا ل ط ا ل ا ا ن ن ك م ي ا م ك

<#root>

Border-2#

show monitor capture 1 buffer display-filter frame.number==114 detailed

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

Frame 114: 96 bytes on wire (768 bits), 96 bytes captured (768 bits) on interface /tmp/epc\_ws/wif\_to\_ts.

```

Interface id: 0 (/tmp/epc_ws/wif_to_ts_pipe)
  Interface name: /tmp/epc_ws/wif_to_ts_pipe
Encapsulation type: Ethernet (1)
Arrival Time: Oct 24, 2023 15:41:06.573261000 UTC
[Time shift for this packet: 0.000000000 seconds]
Epoch Time: 1698162066.573261000 seconds
[Time delta from previous captured frame: 0.007008000 seconds]
[Time delta from previous displayed frame: 0.000000000 seconds]
[Time since reference or first frame: 12.774428000 seconds]
Frame Number: 114
Frame Length: 96 bytes (768 bits)
Capture Length: 96 bytes (768 bits)
[Frame is marked: False]
[Frame is ignored: False]
[Protocols in frame: eth:ethertype:ip:udp:lisp]

```

Ethernet II, Src: 00:00:00:00:00:00 (

00:00:00:00:00:00

), Dst: 00:00:00:00:00:00 (
00:00:00:00:00:00
)

<-- CPU Inject does not properly show MAC addresses

Destination: 00:00:00:00:00:00 (00:00:00:00:00:00)
Address: 00:00:00:00:00:00 (00:00:00:00:00:00)
.... ..0. .... = LG bit: Globally unique address (factory default)
.... ...0 .... = IG bit: Individual address (unicast)
Source: 00:00:00:00:00:00 (00:00:00:00:00:00)
Address: 00:00:00:00:00:00 (00:00:00:00:00:00)
.... ..0. .... = LG bit: Globally unique address (factory default)
.... ...0 .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)

Internet Protocol Version 4,

Src: 10.47.1.11, Dst: 10.47.1.12 <-- Border-2 RLOC and Edge-1 RLOC, respectively

0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)
.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 82
Identification: 0xe231 (57905)
Flags: 0x0000
0... .... = Reserved bit: Not set
.0.. .... = Don't fragment: Not set
..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0xc234 [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.1.11
Destination: 10.47.1.12

User Datagram Protocol, Src Port: 4342, Dst Port: 4342

Source Port: 4342
Destination Port: 4342
Length: 62
Checksum: 0xe1d6 [unverified]
[Checksum Status: Unverified]
[Stream index: 1]
[Timestamps]
[Time since first frame: 0.007008000 seconds]
[Time since previous frame: 0.007008000 seconds]

Locator/ID Separation Protocol

0010 .... = Type: Map-Reply (2)
.... 0... = P bit (Probe): Not set
.... .0.. = E bit (Echo-Nonce locator reachability algorithm enabled): Not set
.... ..0. = S bit (LISP-SEC capable): Not set
.... ...0 0000 0000 0000 0000 = Reserved bits: 0x000000
Record Count: 1

Nonce: 0x50c5f2b60b41ca1c

Mapping Record 1, EID Prefix: Unknown LCAF Type (53)/32, TTL: 1440, Action: No-Action, Not Authorit

Record TTL: 1440
Locator Count: 1
EID Mask Length: 32
000. .... = Action: No-Action (0)
...0 .... = Authoritative bit: Not set





Edge-1#

```
debug lisp control-plane all
```

Edge-1#

```
debug l2lisp all
```

\*Oct 24 16:19:54.843: LISP[REMT ]-0: Received Map-Reply with nonce 0x37F890B9-0xAC60D2B9, 1 records.

\*Oct 24 16:19:54.843: LISP[MS ]-0: This is a Address Resolution message.

\*Oct 24 16:19:54.843: LISP[REMT ]-0: Map-Reply nonce matches pending request for IID 8190 EID 10.47.4.3.

\*Oct 24 16:19:54.843: LISP[REMT ]-0:

Processing Map-Reply mapping record for IID 8190 Eth-ARP 10.47.4.3/32 LCAF 53, ttl 1440, action none, no

\*Oct 24 16:19:54.843: LISP[REMT ]-0:

5254.001e.ad00 pri/wei/dID/mID/met/si\_type/si\_id/si\_flg/afn\_id=1/100/0/0/4294967295/none/0/UNSPEC/UNSPEC

\*Oct 24 17:11:24.056: LISP[REMT ]-0 IID 8190: Schedule processing of Map-Requests from 'remote EID prefix'

Map Request: Sending request for IID 8190 EID 5254.001e.ad00/48, requester 'remote EID prefix'.>

رېش تسي و، MAC 10.47.4.3 ناونع ب صاخ لا، LISP ة طي رخ ب ل ط LISP Control-Plane ل بقت سي  
MAC-RLOC ط بر عم LISP ة طي رخ در لس ري و L2 LISP IID 8190 ل تنرثي ا ل م داخ ل و دج

<#root>

Border-1#

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

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

250 28.656076 0.0.0.0 -> 0.0.0.0 LISP 176 Encapsulated Map-Request for [8190] 52:54:00:1e:

251 28.658851

10.47.1.10 -> 10.47.1.12 LISP 96 Map-Reply for [8190] 52:54:00:1e:ad:00/48

## Map-Reply و LISP طيرة بلط يلع بٲك نع ةرظن ءاقلل اننكمي

<#root>

Border-1#

```
show monitor capture 1 buffer display-filter frame.number==250 detailed
```

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

Frame 250: 176 bytes on wire (1408 bits), 176 bytes captured (1408 bits) on interface /tmp/epc\_ws/wif\_to\_ts\_pipe

Interface id: 0 (/tmp/epc\_ws/wif\_to\_ts\_pipe)

Interface name: /tmp/epc\_ws/wif\_to\_ts\_pipe

Encapsulation type: Ethernet (1)

Arrival Time: Oct 24, 2023 17:37:11.647755000 UTC

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1698169031.647755000 seconds

[Time delta from previous captured frame: 0.315724000 seconds]

[Time delta from previous displayed frame: 0.000000000 seconds]

[Time since reference or first frame: 28.656076000 seconds]

Frame Number: 250

Frame Length: 176 bytes (1408 bits)

Capture Length: 176 bytes (1408 bits)

[Frame is marked: False]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:udp:lisp:ip:udp:lisp]

Ethernet II, Src: 52:54:00:04:84:b1 (52:54:00:04:84:b1), Dst: 52:54:00:0a:42:f3 (52:54:00:0a:42:f3)

Destination: 52:54:00:0a:42:f3 (52:54:00:0a:42:f3)

Address: 52:54:00:0a:42:f3 (52:54:00:0a:42:f3)

.... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)

.... ..0 .... = IG bit: Individual address (unicast)

Source: 52:54:00:04:84:b1 (52:54:00:04:84:b1)

Address: 52:54:00:04:84:b1 (52:54:00:04:84:b1)

.... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)

.... ..0 .... = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4,

Src: 10.47.1.12, Dst: 10.47.1.10 <-- Edge-1 RLOC and Border-1 RLOC, respectively

0100 .... = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)

1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)

.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 162

Identification: 0x75e5 (30181)

Flags: 0x0000

0... .... = Reserved bit: Not set

.0.. .... = Don't fragment: Not set

..0. .... = More fragments: Not set

Fragment offset: 0

Time to live: 255

Protocol: UDP (17)

Header checksum: 0x2e32 [validation disabled]

[Header checksum status: Unverified]

Source: 10.47.1.12

Destination: 10.47.1.10

User Datagram Protocol, Src Port: 4342, Dst Port: 4342

Source Port: 4342

```
Destination Port: 4342
Length: 142
Checksum: 0x46f1 [unverified]
[Checksum Status: Unverified]
[Stream index: 4]
[Timestamps]
  [Time since first frame: 0.000000000 seconds]
  [Time since previous frame: 0.000000000 seconds]
Locator/ID Separation Protocol
1000 .... = Type: Encapsulated Control Message (8)
.... 0... = S bit (LISP-SEC capable): Not set
.... .0.. = D bit (DDT-originated): Not set
.... ..00 0000 0000 0000 0000 0000 0000 = Reserved bits: 0x00000000
Internet Protocol Version 4, Src: 0.0.0.0, Dst: 0.0.0.0
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)
  1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)
  .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 130
Identification: 0x75e4 (30180)
Flags: 0x0000
  0... .... = Reserved bit: Not set
  .0.. .... = Don't fragment: Not set
  ..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0x44c7 [validation disabled]
[Header checksum status: Unverified]
Source: 0.0.0.0
Destination: 0.0.0.0
User Datagram Protocol, Src Port: 4342, Dst Port: 4342
Source Port: 4342
Destination Port: 4342
Length: 110
Checksum: 0x18bb [unverified]
[Checksum Status: Unverified]
[Stream index: 5]
[Timestamps]
  [Time since first frame: 0.000000000 seconds]
  [Time since previous frame: 0.000000000 seconds]
Locator/ID Separation Protocol
0001 .... = Type: Map-Request (1)
.... 0100 00.. = Flags: 0x10
  .... 0... = A bit (Authoritative): Not set
  .... .1.. = M bit (Map-Reply present): Set
  .... ..0. = P bit (Probe): Not set
  .... ...0 = S bit (Solicit-Map-Request): Not set
  .... .... 0... = p bit (Proxy ITR): Not set
  .... .... .0.. = s bit (SMR-invoked): Not set
  .... .... ..00 0000 000. = Reserved bits: 0x000
  .... .... .... .0 0000 = ITR-RLOC Count: 0
Record Count: 1
Nonce: 0x86438e956066d3ca
Source EID AFI: LISP Canonical Address Format (LCAF) (16387)
Source EID: [8190] 00:00:0c:9f:f3:41
  LCAF: Instance ID: 8190, Address: 00:00:0c:9f:f3:41
    LCAF Header: 00000220000c
      Reserved bits: 0x00
      Flags: 0x00
      Type: Instance ID (2)
```

Reserved bits: 0x20  
Length: 12  
Instance ID: 8190  
Address AFI: 802 (includes all 802 media plus Ethernet) (6)  
Address: 00:00:0c:9f:f3:41 (00:00:0c:9f:f3:41)  
ITR-RLOC 1: 10.47.1.12  
ITR-RLOC AFI: IPv4 (1)  
ITR-RLOC Address: 10.47.1.12  
Map-Request Record 1: [8190]

52:54:00:1e:ad:00/48 <-- Map-Request for this specific MAC address

Reserved: 0x00  
Prefix Length: 48  
Prefix AFI: LISP Canonical Address Format (LCAF) (16387)  
Prefix: [8190] 52:54:00:1e:ad:00  
LCAF: Instance ID: 8190, Address: 52:54:00:1e:ad:00  
LCAF Header: 00000220000c  
Reserved bits: 0x00  
Flags: 0x00  
Type: Instance ID (2)  
Reserved bits: 0x20  
Length: 12  
Instance ID: 8190  
Address AFI: 802 (includes all 802 media plus Ethernet) (6)  
Address: 52:54:00:1e:ad:00 (52:54:00:1e:ad:00)

Map-Reply Record

Mapping Record 1, EID Prefix: [8190] 00:00:0c:9f:f3:41/48, TTL: 1440, Action: No-Action, Author

Record TTL: 1440

Locator Count: 1

EID Mask Length: 48

000. .... = Action: No-Action (0)

...1 .... = Authoritative bit: Set

.... .000 0000 0000 = Reserved: 0x000

0000 .... = Reserved: 0x0

.... 0000 0000 0000 = Mapping Version: 0

EID Prefix AFI: LISP Canonical Address Format (LCAF) (16387)

EID Prefix: [8190] 00:00:0c:9f:f3:41

LCAF: Instance ID: 8190, Address: 00:00:0c:9f:f3:41

LCAF Header: 00000220000c

Reserved bits: 0x00

Flags: 0x00

Type: Instance ID (2)

Reserved bits: 0x20

Length: 12

Instance ID: 8190

Address AFI: 802 (includes all 802 media plus Ethernet) (6)

Address: 00:00:0c:9f:f3:41 (00:00:0c:9f:f3:41)

Locator Record 1, Local RLOC: 10.47.1.12, Reachable, Priority/Weight: 10/10, Multicast Prio

Priority: 10

Weight: 10

Multicast Priority: 10

Multicast Weight: 10

Flags: 0x0005

0000 0000 0000 0... = Reserved: 0x0000

.... .1.. = Local: Set

.... ..0. = Probe: Not set

.... ...1 = Reachable: Set

AFI: IPv4 (1)

Locator: 10.47.1.12

<#root>

Border-1#

show monitor capture 1 buffer display-filter frame.number==251 detailed

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

Frame 251: 96 bytes on wire (768 bits), 96 bytes captured (768 bits) on interface /tmp/epc\_ws/wif\_to\_ts.

Interface id: 0 (/tmp/epc\_ws/wif\_to\_ts\_pipe)

Interface name: /tmp/epc\_ws/wif\_to\_ts\_pipe

Encapsulation type: Ethernet (1)

Arrival Time: Oct 24, 2023 17:37:11.650530000 UTC

[Time shift for this packet: 0.000000000 seconds]

Epoch Time: 1698169031.650530000 seconds

[Time delta from previous captured frame: 0.002775000 seconds]

[Time delta from previous displayed frame: 0.000000000 seconds]

[Time since reference or first frame: 28.658851000 seconds]

Frame Number: 251

Frame Length: 96 bytes (768 bits)

Capture Length: 96 bytes (768 bits)

[Frame is marked: False]

[Frame is ignored: False]

[Protocols in frame: eth:ethertype:ip:udp:lisp]

Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00 (00:00:00:00:00:00)

Destination: 00:00:00:00:00:00 (00:00:00:00:00:00)

Address: 00:00:00:00:00:00 (00:00:00:00:00:00)

.... ..0. .... = LG bit: Globally unique address (factory default)

.... ..0 .... = IG bit: Individual address (unicast)

Source: 00:00:00:00:00:00 (00:00:00:00:00:00)

Address: 00:00:00:00:00:00 (00:00:00:00:00:00)

.... ..0. .... = LG bit: Globally unique address (factory default)

.... ..0 .... = IG bit: Individual address (unicast)

Type: IPv4 (0x0800)

Internet Protocol Version 4,

Src: 10.47.1.10, Dst: 10.47.1.12 <-- Border-1 RLOC, Edge-1 RLOC, respectively

0100 .... = Version: 4

.... 0101 = Header Length: 20 bytes (5)

Differentiated Services Field: 0xc0 (DSCP: CS6, ECN: Not-ECT)

1100 00.. = Differentiated Services Codepoint: Class Selector 6 (48)

.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)

Total Length: 82

Identification: 0x12a9 (4777)

Flags: 0x0000

0... .... = Reserved bit: Not set

.0.. .... = Don't fragment: Not set

..0. .... = More fragments: Not set

Fragment offset: 0

Time to live: 255

Protocol: UDP (17)

Header checksum: 0x91be [validation disabled]

[Header checksum status: Unverified]

Source: 10.47.1.10

Destination: 10.47.1.12

User Datagram Protocol, Src Port: 4342, Dst Port: 4342

Source Port: 4342

Destination Port: 4342

Length: 62

Checksum: 0xd63e [unverified]

[Checksum Status: Unverified]

[Stream index: 4]

```

[Timestamps]
  [Time since first frame: 0.002775000 seconds]
  [Time since previous frame: 0.002775000 seconds]
Locator/ID Separation Protocol
0010 .... = Type: Map-Reply (2)
.... 0... = P bit (Probe): Not set
.... .0.. = E bit (Echo-Nonce locator reachability algorithm enabled): Not set
.... ..0. = S bit (LISP-SEC capable): Not set
.... ...0 0000 0000 0000 0000 = Reserved bits: 0x00000
Record Count: 1
Nonce: 0x86438e956066d3ca
Mapping Record 1, EID Prefix: [8190] 52:54:00:1e:ad:00/48, TTL: 1440, Action: No-Action, Not Author
  Record TTL: 1440
  Locator Count: 1
  EID Mask Length: 48
  000. .... = Action: No-Action (0)
  ...0 .... = Authoritative bit: Not set
  .... .000 0000 0000 = Reserved: 0x000
  0000 .... = Reserved: 0x0
  .... 0000 0000 0000 = Mapping Version: 0
  EID Prefix AFI: LISP Canonical Address Format (LCAF) (16387)
  EID Prefix: [8190] 52:54:00:1e:ad:00
    LCAF: Instance ID: 8190, Address: 52:54:00:1e:ad:00
      LCAF Header: 00000220000c
        Reserved bits: 0x00
        Flags: 0x00
        Type: Instance ID (2)
        Reserved bits: 0x20
        Length: 12
        Instance ID: 8190
        Address AFI: 802 (includes all 802 media plus Ethernet) (6)
        Address: 52:54:00:1e:ad:00 (52:54:00:1e:ad:00)
Locator Record 1, RLOC: 10.47.1.13, Reachable, Priority/Weight: 10/10, Multicast Priority/Weight
  Priority: 10
  Weight: 10
  Multicast Priority: 10
  Multicast Weight: 10
  Flags: 0x0001
    0000 0000 0000 0... = Reserved: 0x0000
    .... .... .0.. = Local: Not set
    .... .... ..0. = Probe: Not set
    .... .... ...1 = Reachable: Set
  AFI: IPv4 (1)

```

Locator: 10.47.1.13 <-- This RLOC owns the MAC address

<#root>

Border-1#

debug lisp control-plane all

Border-1#

debug l2lisp all

```
*Oct 24 18:03:00.361: LISP[TRNSP]-0: Processing received Map-Request(1) message on GigabitEthernet1/0/3
*Oct 24 18:03:00.361: LISP[MR ]-0: Received Map-Request with 1 records, first EID IID 8190 5254.001e.
*Oct 24 18:03:00.361: LISP[MR ]-0
IID 8190 MAC: MS EID 5254.001e.ad00/48: Sending proxy reply to 10.47.1.12.
```

## Edge-1 ملت سي LISP Map-Reply نم border-1

```
<#root>
```

```
Edge-1#
```

```
debug lisp control-plane all
```

```
Edge-1#
```

```
debug l2lisp all
```

```
*Oct 24 17:11:24.558: LISP[TRNSP]-0: Processing received Map-Reply(2) message on GigabitEthernet1/0/1 f
*Oct 24 17:11:24.558: LISP[REMT ]-0: Received Map-Reply with nonce 0x38A78BA8-0xC378149D, 1 records.
*Oct 24 17:11:24.558: LISP[REMT ]-0: Map-Reply nonce matches pending request for IID 8190 EID 5254.001e
*Oct 24 17:11:24.558: LISP[REMT ]-0:
```

```
Processing Map-Reply mapping record for IID 8190 MAC 5254.001e.ad00/48 LCAF 2, ttl 1440, action none, no
```

```
*Oct 24 17:11:24.559: LISP[REMT ]-0:
```

```
10.47.1.13
```

```
pri/wei/dID/mID/met/si_type/si_id/si_flg/afn_id=10/10/0/0/4294967295/none/0/UNSPEC/UNSPEC 1pR.
```

## edge-1 ربح CPU EPC لISP/ISF لدابت لالخ نم لم الكلاب ARP بلط ضرع نكمي

```
<#root>
```

```
Edge-1#
```

```
show monitor capture 1 buffer display-filter "arp.dst.proto_ipv4==10.47.4.3 or lisp"
```

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

```
120 18.415474 52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP 60 Who has 10.47.4.3? Tell 10.47.4.2
```

```
<-- Broadcast ARP Request punted up to the CPU
```

```
121 18.416092 10.47.4.3 -> 10.47.4.3 LISP 114 Encapsulated Map-Request for Unknown LCAF Type (
```

```
<-- LISP Map-Request to obtain the MAC address of 10.47.4.3
```

```
135 19.598041 10.47.1.11 -> 10.47.1.12 LISP 96 Map-Reply for Unknown LCAF Type (53)/32
```

```
<-- LISP Map-Reply providing the MAC address of 10.47.4.3
```

```
136 19.613072 0.0.0.0 -> 0.0.0.0 LISP 176 Encapsulated Map-Request for [8190] 52:54:00:1e:
```

```
<-- LISP Map-Request to obtain the RLOC for MAC address 5254.001e.ad00
```

```

138 20.119722 10.47.1.10 -> 10.47.1.12 LISP 96 Map-Reply for [8190] 52:54:00:1e:ad:00/48
<-- LISP Map-Reply for the RLOC that owns MAC address 5254.001e.ad00

143 20.477618 52:54:00:19:93:e9 -> 52:54:00:1e:ad:00 ARP 60 Who has 10.47.4.3? Tell 10.47.4.2
<-- Unicast ARP Request injected down from the CPU

```

ةفاضإلاب طئإرخلل تقؤم نيزخت ةركاذ لإخدا دجوي، Edge-1 لىل ع مكحتللا ىوتسم براقوت درجم ب  
لإل ISF (RMT) ل دع ب نع لإخدا لإل لىل

```
<#root>
```

```
Edge-1#
```

```
show lisp instance-id 8190 ethernet map-cache 5254.001e.ad00
```

```
LISP MAC Mapping Cache for LISP 0 EID-table Vlan 1026 (IID 8190), 1 entries
```

```
5254.001e.ad00/48
```

```
, uptime: 00:06:26, expires: 23:53:34, via map-reply, complete
Sources: map-reply
State: complete, last modified: 00:06:26, map-source: 10.47.1.13
Active, Packets out: 11(0 bytes), counters are not accurate (~ 00:00:00 ago)
Encapsulating dynamic-EID traffic
Locator      Uptime      State  Pri/Wgt      Encap-IID

```

```
10.47.1.13
```

```

00:06:26 up      10/10      -
Last up-down state change:      00:06:26, state change count: 1
Last route reachability change: 2w0d, state change count: 1
Last priority / weight change:  never/never
RLOC-probing loc-status algorithm:
Last RLOC-probe sent:           00:06:25 (rtt 1104ms)

```

```
Edge-1#
```

```
show device-tracking database address 10.47.4.3
```

```

Codes: L - Local, S - Static, ND - Neighbor Discovery, ARP - Address Resolution Protocol, DHCP - IPv4 DHCP
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      ag

```

```
RMT
```

```
10.47.4.3
```



5254.001e.ad00

L2LI0 1026 0005 7mn STALE try 0 731 s

نكومي ال، ركذت. ةيزكرملا ةجلالعملما ةدحو نم يداحألما ثبلل ARP بلط نقح متي، كلذ دعب نكمي، ةيداملما تاهجاولما يلع EPC عم جرخملا هاجتإ يف اهنقح مت يتلما CPU مزح طاقتلما ةم لتسملا ةينبلما ةفاح ةدقع يلع EPC لخدم وأ (SPAN) Switchport ذفم للحم مادختسإ ثبلل يداحأ ARP فيلغت مت يذلما VXLAN بلط مالتسإ ديكأتل

## Edge-2 (10.47.1.13)

VLAN 1026 لجاتنإ ل VLAN id ل يف جردم نراق قفن وأ ل lip ل نأ تققد، لوأ

<#root>

Edge-2#

show vlan id 1026

VLAN Name	Status	Ports
1026 red	active	

L2LI0:8190

, Gi1/0/3

<-- L2 LISP IID is associated

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1026	enet	101026	1500	-	-	-	-	-	0	0

Remote SPAN VLAN

Disabled

Primary	Secondary	Type	Ports
---------	-----------	------	-------

ثبلل ARP بلط نأ امب. ملتسي در ARP فلغي VXLAN ل edge-2 يلع EPC لخدم حضوي، نألما Edge-1 RLOC دض لثامي نأ ip acl تلمعتسإ عيطتسي تنأ، VXLAN فيلغت متي يداحألما ةكرحلا حشرم دعاسي نأ (يللاوتلما يلع 10.47.1.13، هاجتاب 10.47.1.12) Edge-2 RLOC وحن لسري رورم.

<#root>

Edge-2(config)#

ip access-list extended tac

```
Edge-2(config-ext-nacl)#
```

```
permit ip host 10.47.1.12 host 10.47.1.13
```

```
Edge-2#
```

```
monitor capture 1 interface g1/0/1 in access-list tac
```

```
Edge-2#
```

```
monitor capture 1 interface g1/0/2 in access-list tac
```

```
Edge-2#
```

```
monitor capture 1 start
```

```
Started capture point : 1
```

```
Edge-2#
```

```
monitor capture 1 stop
```

```
Capture statistics collected at software:
```

```
Capture duration - 20 seconds
```

```
Packets received - 10
```

```
Packets dropped - 0
```

```
Packets oversized - 0
```

```
Number of Bytes dropped at asic not collected
```

```
Capture buffer will exist till exported or cleared
```

```
Stopped capture point : 1
```

```
Edge-2#
```

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

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

```
1 0.000000
```

```
52:54:00:19:93:e9 -> 52:54:00:1e:ad:00 ARP 110 Who has 10.47.4.3? Tell 10.47.4.2
```

س وۇرو، UDP س أرو، VXLAN نېمىضت كانه ىرت نأ ك نكمي، قدا لكش ب اذه ARP ب ل ط ص ح ف د ن ع  
ة. د ا ع ت ب ا ب 60، ر ي غ ص ARP ر ا ط ا ن ا م ب، ى ر خ ا

```
<#root>
```

```
Edge-2#
```

```
show monitor capture 1 buffer display-filter frame.number==1 detailed
```

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

```
Frame 1: 110 bytes on wire (880 bits), 110 bytes captured (880 bits) on interface /tmp/epc_ws/wif_to_ts
```

```
Interface id: 0 (/tmp/epc_ws/wif_to_ts_pipe)
```

```
Interface name: /tmp/epc_ws/wif_to_ts_pipe
```

```
Encapsulation type: Ethernet (1)
```

```
Arrival Time: Oct 24, 2023 18:57:34.642468000 UTC
```

```
[Time shift for this packet: 0.000000000 seconds]
```

```

Epoch Time: 1698173854.642468000 seconds
[Time delta from previous captured frame: 0.000000000 seconds]
[Time delta from previous displayed frame: 0.000000000 seconds]
[Time since reference or first frame: 0.000000000 seconds]
Frame Number: 1
Frame Length: 110 bytes (880 bits)
Capture Length: 110 bytes (880 bits)
[Frame is marked: False]
[Frame is ignored: False]
[Protocols in frame: eth:ethertype:ip:udp:vxlan:eth:ethertype:arp]
Ethernet II, Src: 52:54:00:0a:42:11 (52:54:00:0a:42:11), Dst: 52:54:00:17:fe:65 (52:54:00:17:fe:65)
Destination: 52:54:00:17:fe:65 (52:54:00:17:fe:65)
Address: 52:54:00:17:fe:65 (52:54:00:17:fe:65)
.... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)
.... ..0. .... = IG bit: Individual address (unicast)
Source: 52:54:00:0a:42:11 (52:54:00:0a:42:11)
Address: 52:54:00:0a:42:11 (52:54:00:0a:42:11)
.... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)
.... ..0. .... = IG bit: Individual address (unicast)
Type: IPv4 (0x0800)
Internet Protocol Version 4,
Src: 10.47.1.12, Dst: 10.47.1.13 <-- Edge-1 RLOC and Edge-2 RLOC, respectively

0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
0000 00.. = Differentiated Services Codepoint: Default (0)
.... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 96
Identification: 0x798a (31114)
Flags: 0x4000, Don't fragment
0... .... = Reserved bit: Not set
.1.. .... = Don't fragment: Set
..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 253
Protocol: UDP (17)
Header checksum: 0xed8b [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.1.12
Destination: 10.47.1.13
User Datagram Protocol, Src Port: 65354, Dst Port: 4789
Source Port: 65354
Destination Port: 4789
Length: 76
[Checksum: [missing]]
[Checksum Status: Not present]
[Stream index: 0]
[Timestamps]
[Time since first frame: 0.000000000 seconds]
[Time since previous frame: 0.000000000 seconds]
Virtual eXtensible Local Area Network
Flags: 0x8800, GBP Extension, VXLAN Network ID (VNI)
1... .... = GBP Extension: Defined
.... ....0.. = Don't Learn: False
.... 1... = VXLAN Network ID (VNI): True
.... .... 0... = Policy Applied: False
.000 .000 0.00 .000 = Reserved(R): 0x0000
Group Policy ID: 0
VXLAN Network Identifier (VNI):

```

8190 <-- LISP L2 IID

```

Reserved: 0
Ethernet II, Src: 52:54:00:19:93:e9 (
52:54:00:19:93:e9
), Dst: 52:54:00:1e:ad:00 (
52:54:00:1e:ad:00
)
<-- True source and destination endpoint MAC address
Destination: 52:54:00:1e:ad:00 (52:54:00:1e:ad:00)
Address: 52:54:00:1e:ad:00 (52:54:00:1e:ad:00)
.... ..1. .... = LG bit: Locally administered address (this is NOT the factory d
.... ..0 .... = IG bit: Individual address (unicast)
Source: 52:54:00:19:93:e9 (52:54:00:19:93:e9)
Address: 52:54:00:19:93:e9 (52:54:00:19:93:e9)
.... ..1. .... = LG bit: Locally administered address (this is NOT the factory d
.... ..0 .... = IG bit: Individual address (unicast)
Type: ARP (0x0806)
Trailer: 00000000000000000000000000000000
Address Resolution Protocol (request)
Hardware type: Ethernet (1)
Protocol type: IPv4 (0x0800)
Hardware size: 6
Protocol size: 4
Opcode: request (1)
Sender MAC address: 52:54:00:19:93:e9 (
52:54:00:19:93:e9
)
Sender IP address:
10.47.4.2
Target MAC address: 00:00:00:00:00:00 (
00:00:00:00:00:00
)
Target IP address:
10.47.4.3

```

دحوى تحت يداحأل ا ث بلل ARP بلط ىل ع ةمالع عضو و VLAN نيمضت ةي لمع Edge-2 حضوي ةادأ طاقتلا لال خ نم ك ل ذ ةظحال م ن كم يو . ةجالعالم نم ديزم ىل ع لوصحلل ةيزك رمل ةجالعالم FED Punject.

<#root>

Edge-2#

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

Punt packet capturing started.

Edge-2#

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

Punt packet capturing stopped. Captured 21 packet(s)

Edge-2#

```
show platform software fed sw active punt packet-capture display-filter "arp" brief
```

Punt packet capturing: disabled. Buffer wrapping: disabled  
Total captured so far: 21 packets. Capture capacity : 4096 packets

```
----- Punt Packet Number: 6, Timestamp: 2023/10/24 19:14:32.930 -----  
interface : physical: [if-id: 0x00000000], pa1:
```

L2LISP0

```
[if-id: 0x00000017]  
metadata : cause: 109 [snoop packets], sub-cause: 1,
```

q-no: 16,

```
linktype: MCP_LINK_TYPE_IP [1]
```

ether hdr :

```
dest mac: 5254.001e.ad00, src mac: 5254.0019.93e9
```

```
ether hdr : ethertype: 0x0806 (ARP)
```

ARP عا ل ط ت س ا ة ي ل م ع ي ل ا ARP ب ل ط ل ا س ر ا م ت ي

<#root>

```
Edge-2#debug platform software infrastructure punt
```

```
*Oct 24 19:18:38.916: PUNT RX: mcprp_process_receive_packet: pak->vlan_id: 1026
```

```
*Oct 24 19:18:38.916: Punt: IP proto src 147.233.
```

```
10.47, dst 4.2.
```

```
0.0, from table 0, intf L2LI0, encaps LISP, size 60
```

,

```
cause snoop packets(L3)
```


```
<-- You can see the 10.47.4.2
```

```
*Oct 24 19:18:38.916: punt cause:snoop packets invoking reg_invoke_mcprp_punt_feature_msg
```

```
*Oct 24 19:18:38.916: punt cause:snoop packets
```

```
MCPRP_PUNT_PAK_PROC_OK_DONE
```

---

 رذح ب مادخت س ا ل ا ، ة ر ث ر ث ل ا و ه ا ذ ه ا ط ا خ ا ل ا ح ي ح ص ت : ر ي ذ ح ت

---

10.47.4.2 ا ق ل ط م م ل ع ت ي ال Edge-2 ن ا ف . ق ف ن / L2 LISP ة ه ج ا و ن م ي ت ا ي ا ذ ه ARP ب ل ط ن ا م ب  
LISP ي ف ي ك ي م ا ن ي د د ي ع ل ة ي ل ح م ة ي ا ه ن ة ط ق ن ك

<#root>

Edge-2#s

show platform arpsnooping client 5254.0019.93e9

PLAT\_DAI : Platform DAI shim
FWDPLANE : Dataplane forwarding
BRIDGE : Packet to be bridged
ARPSN : Arp Snooping
Packet Trace for client MAC 5254.0019.93E9:

Table with 6 columns: Timestamp, Sender Mac, Sender IP, Target Mac, Target IP, Opcode. It shows three rows of ARP request data for client MAC 5254.0019.93e9.

PLATF\_DAI: SHUNTED

ةصاخو ، 1026 مقرر VLAN ةكبش ىل ةيزكرملا ةجلاعمل ةدحو نم ARP بلط خض متي ، نأل
اهب الصتم 10.47.4.3 نوكي شيح ، Gi1/0/3

<#root>

Edge-2#

show mac address-table address 5254.001e.ad00

Mac Address Table

Table with 4 columns: Vlan, Mac Address, Type, Ports. It shows one entry for Vlan 1026, Mac Address 5254.001e.ad00, Type DYNAMIC, and Ports Gi1/0/3.

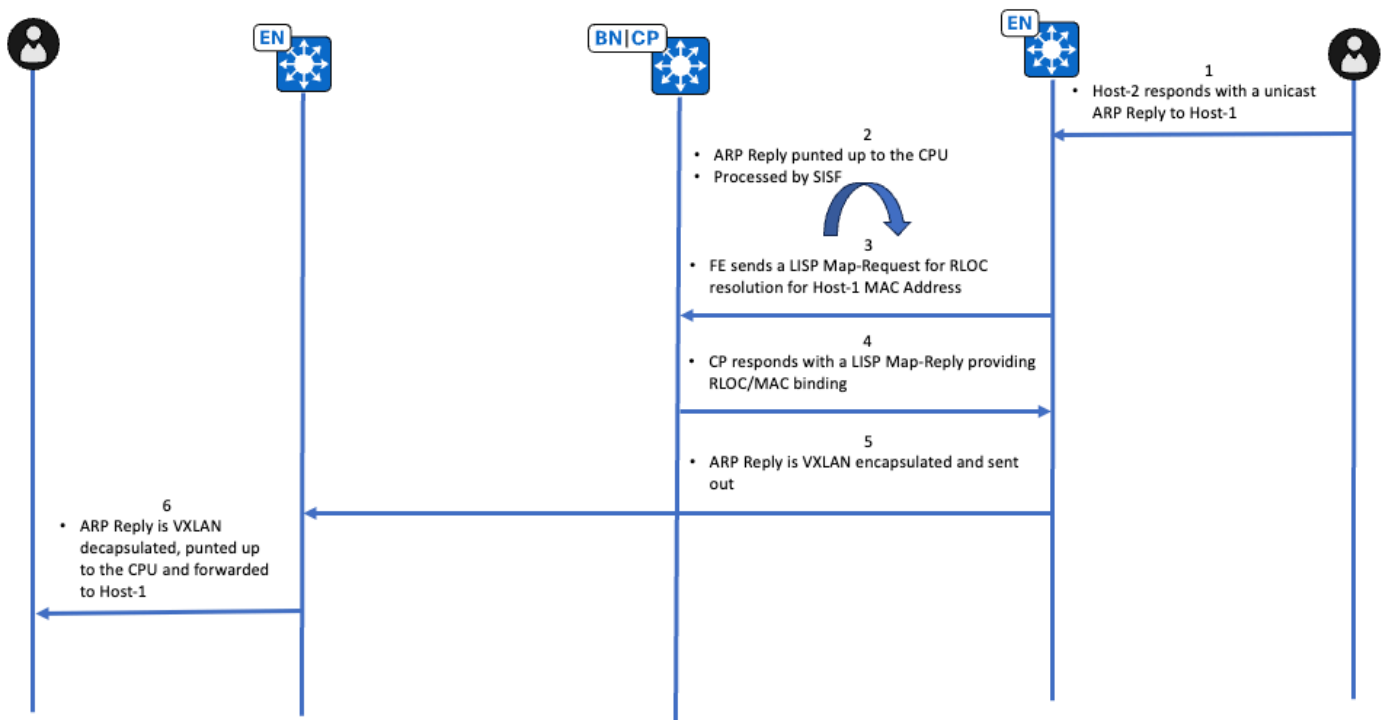
Edge-2#

show platform arpsnooping client 5254.001e.ad00

PLAT\_DAI : Platform DAI shim
FWDPLANE : Dataplane forwarding
BRIDGE : Packet to be bridged
ARPSN : Arp Snooping
Packet Trace for client MAC 5254.001E.AD00:

Table with 6 columns: Timestamp, Sender Mac, Sender IP, Target Mac, Target IP, Opcode. It shows two rows of ARP request data for client MAC 5254.001E.AD00.

يداحأل ا شبلل ARP راسم ىلع درلل ىوتسملا ىللا ل مع ريس



## ثب ل ا يد ا ح ا راس م ل ل ARP در ن م ق ق ح ت ل ا

Edge-2 (10.47.1.13)

در ARP در ض ر ف م ت ي و ، ي د ا ح ا ل ا ث ب ل ل ARP در ع م 10.47.4.3 ك ل م ت ي ت ل ا ة ي ا ه ن ل ا ة ط ق ن ب ي ج ت س ت  
 ة ه ج ا و ل ا ي ل ع EPC ر ب ع ي ل و ا ل ا ق ق ح ت ل ا ث د ح ي . IPDT د و ج و ب ب س ب ة ي ز ك ر م ل ا ة ج ل ا ع م ل ا ة د ح و ي ل ع  
 ة ي ا ه ن ل ا ة ط ق ن ه ج ا و ت ي ت ل ا

<#root>

Edge-2#

```
show monitor capture 1 buffer display-filter arp
```

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

```
2 88.712035
```

```
52:54:00:1e:ad:00 -> 00:00:0c:9f:f3:41 ARP 60 10.47.4.3 is at 52:54:00:1e:ad:00
```

ة ص ا ص ق ل ا FED ع م ط غ ا ض ل ا ا ر ج ا ل ا ن م ق ق ح ت ، ك ل ذ د ع ب

<#root>

Edge-2#

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

Punt packet capturing started.

Edge-2#

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

Punt packet capturing stopped. Captured 22 packet(s)

Edge-2#

```
show platform software fed sw active punt packet-capture display-filter "arp" brief
```

Punt packet capturing: disabled. Buffer wrapping: disabled  
Total captured so far: 22 packets. Capture capacity : 4096 packets

----- Punt Packet Number: 6, Timestamp: 2023/10/24 20:32:35.634 -----  
interface : physical: [if-id: 0x00000000], pa1:

L2LISP0

[if-id: 0x00000017]  
metadata : cause: 109 [

snoop packets]

, sub-cause: 1,

q-no: 16

, linktype: MCP\_LINK\_TYPE\_IP [1]

<-- Punted for Snoop Packets to CPU queue 16

ether hdr :

dest mac: 5254.001e.ad00

,

src mac: 5254.0019.93e9

ether hdr : ethertype: 0x0806 (ARP)

زاهجلا عبتتو ARP عالطتسإلى ARP در ريرمت متي، كلذ دعب

<#root>

Edge-2#

```
debug platform software infrastructure punt
```

\*Oct 24 19:18:39.101: PUNT RX: mcprp\_process\_receive\_packet: pak->vlan\_id: 1026

\*Oct 24 19:18:39.101: Punt: IP proto src 173.0.

10.47

, dst

4.3

.82.84, from table 0, intf Gi1/0/3, encap ARPA, size 60, cause snoop packets(L3)

<-- 10.47.4.3 is obscured

\*Oct 24 19:18:39.101: punt cause:snoop packets invoking reg\_invoke\_mcprp\_punt\_feature\_msg





Edge-2#

debug l2lisp all

\*Oct 24 20:47:34.400: LISP[REMT ]-0 IID 8190: Schedule processing of Map-Requests from 'remote EID pref

\*Oct 24 20:47:34.401: LISP[REMT ]-0:

Map Request: Sending request for IID 8190 EID 5254.0019.93e9/48, requester 'remote EID prefix'.

\*Oct 24 20:47:35.166: LISP[TRNSP]-0: Processing received Map-Reply(2) message on GigabitEthernet1/0/1 f

\*Oct 24 20:47:35.166: LISP[REMT ]-0:

Received Map-Reply with nonce 0x5879579E-0xCAFC0AA5, 1 records.

\*Oct 24 20:47:35.166: LISP[REMT ]-0:

Processing Map-Reply mapping record for IID 8190 MAC 5254.0019.93e9/48 LCAF 2, ttl 1440, action none, no

\*Oct 24 20:47:35.166: LISP[REMT ]-0:

10.47.1.12

pri/wei/dID/mID/met/si\_type/si\_id/si\_flg/afn\_id=10/10/0/0/4294967295/none/0/UNSPEC/UNSPEC 1pR.

أشركت في show lisp instance-id <L2 IID> ethernet map-cache <destination mac address>  
VXLAN نية مضت عم هي ل اذ ARP در ل اس را م تي س RLOC ي ا نم ق ق ح ت ل ل

<#root>

Edge-2#

show lisp instance-id 8190 ethernet map-cache 5254.0019.93e9

LISP MAC Mapping Cache for LISP 0 EID-table Vlan 1026 (IID 8190), 1 entries

5254.0019.93e9/48

, uptime: 00:03:45, expires: 23:56:15, via map-reply, complete

Sources: map-reply

State: complete, last modified: 00:03:45, map-source: 10.47.1.12

Active, Packets out: 6(0 bytes), counters are not accurate (~ 00:00:59 ago)

Encapsulating dynamic-EID traffic

Locator Uptime State Pri/Wgt Encap-IID

10.47.1.12

00:03:45 up 10/10 -

Last up-down state change: 00:03:45, state change count: 1

Last route reachability change: 2w0d, state change count: 1

Last priority / weight change: never/never

RLOC-probing loc-status algorithm:

Last RLOC-probe sent: 00:03:45 (rtt 861ms)

ة ج ل ا ع م ل ا ة د ح و ن م (ARP) ن ي و ا ن ع ل ل ل ل ح ت ل ل و ك و ت و ر ب ي ل ع د ر ل ل ل ا خ د ا ن ك م ي ، LISP ل ل ل ح ت د ع ب



BRIDGE : Packet to be bridged  
 ARPSN : Arp Snooping  
 Packet Trace for client MAC 5254.001E.AD00:

Timestamp	Sender Mac	Sender IP	Target Mac	Target IP	Opcode
2023/10/24 20:47:38.151	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
PLATF_DAI:RECEIVED INPUT					
2023/10/24 20:47:38.151	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
2023/10/24 20:47:38.152	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
PLATF_DAI:TO_ARPSND					
2023/10/24 20:47:38.152	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
2023/10/24 20:47:38.152	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
INJECT:INJ_VLAN_IFINPUT_TO_BDI					
2023/10/24 20:47:38.152	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
INJECT:BD_DPIDX_TO_FWDPLANE					

## Edge-1 (10.47.1.12)

جاء في ARP على الـ سرور وجراخ س آر POP VXLAN، در ARP فلغى VXLAN لـ Edge-1 ملت سي  
 ة ج ل اع م ر ي ث ك ل ة ي ز ك ر م ل ا ة ج ل اع م ل ا

<#root>

Edge-1#

debug platform software infrastructure punt

\*Oct 24 21:42:11.303: PUNT RX: mcprp\_process\_receive\_packet: pak->vlan\_id: 1026

\*Oct 24 21:42:11.303: Punt: IP proto src 173.0.

10.47

, dst

4.3

.82.84, from table 0,

intf L2LI0

, encaps LISP, size 60, cause snoop packets(L3)

<-- Can see 10.47.4.3 IP address that has been obscured

\*Oct 24 21:42:11.303: punt cause:snoop packets invoking reg\_invoke\_mcprp\_punt\_feature\_msg

\*Oct 24 21:42:11.303: punt cause:snoop packets MCRP\_PUNT\_PAK\_PROC\_OK\_DONE

ىلع لوصح لل show platform arpsnooping client <source mac address> رمال مادختسا كنكمي  
Edge-1 ىلع ARP درة لاعم ةيفيكي لوح ةيفاضا تامولعم

<#root>

Edge-1#

show platform arpsnooping client 5254.001e.ad00

PLAT\_DAI : Platform DAI shim  
FWDPLANE : Dataplane forwarding  
BRIDGE : Packet to be bridged  
ARPSN : Arp Snooping  
Packet Trace for client MAC 5254.001E.AD00:

Timestamp	Sender Mac	Sender IP	Target Mac	Target IP	Opcode
2023/10/24 20:40:33.741	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
2023/10/24 20:40:33.741	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
2023/10/24 20:40:33.741	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY

PLATF\_DAI:SHUNTED

2023/10/24 20:40:33.741	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY
2023/10/24 20:40:33.741	5254.001e.ad00	10.47.4.3	5254.0019.93e9	10.47.4.2	ARP_REPLY

INJECT:BD\_DPIDX\_TO\_FWDPLANE

ةياهنلا ةطقن ثيح ءانيملا ىلى، VLAN 1026 ىلى در ARP لى لسريو باوج ARP لى ذخأي Edge-1  
شيعي 10.47.4.2

<#root>

Edge-1#

show mac address-table address 5254.0019.93e9

Mac Address Table

Vlan	Mac Address	Type	Ports
1026	5254.0019.93e9	DYNAMIC	Gi1/0/3

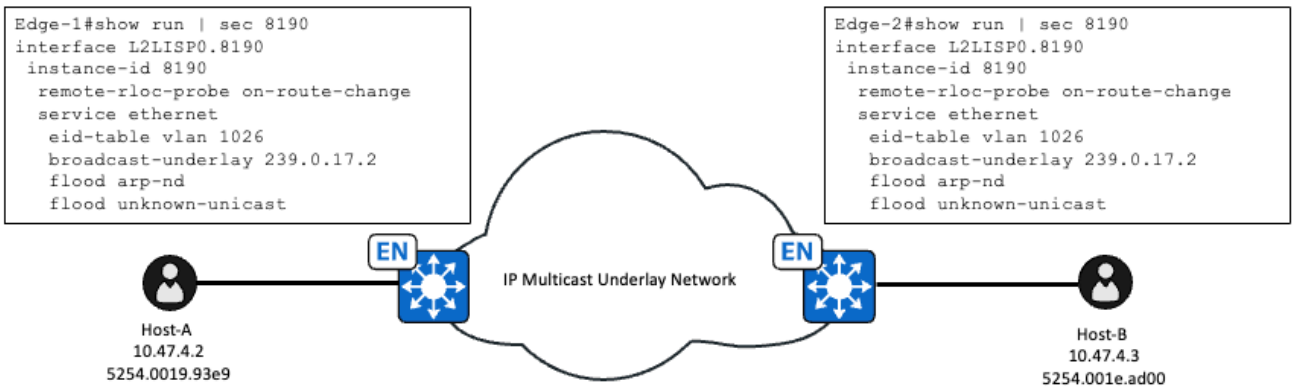
Total Mac Addresses for this criterion: 1

## رمغ راسم ARP (رمغ L2)

ةينبلل يفة ينبللة فاح دقع عيمج مضمنت ثيح ARP لى لحت اضاى ثدحي نا نكمي، L2 رمغ عم

ةيساسأ ةعومجم ىلإ ددعتملا ثبلا معدت يتلا ةهجوملا L2/IP لقن دودح ىلإ ةفاضلإاب متي Edge، ةدقع ىلإ قفدتلل لهؤم راطل/ةمزح اهيف لصت ةرم لك . ةكرتشم ةكرتشم نكمي . ةيساسألا ددعتملا ثبلا ةعومجم ةهجوملا IP ناو نع عم VXLAN ةكبش نيضت ةني عم تاهويراني س في ARP ةقد ىل ع L2 رمغ قي بطت:

- (VLAN)، ةيرهظلا ةيحلحلملا ةكبشلل L2 LISP لي شم تحت flood arp-nd رمال نيوكت متي ددعتملا ثبلا ةعومجم مادختساب ةينبلا فواح عيمج ىلإ ثبلا ARP تاراطل قفدت متي ثبلا ةيساسألا .
- في L2 ناضيف نيكمت دن Cisco Catalyst Center نأ ال flood arp-nd رمال نيوكت متي يكلسال عمجتك عمجتلا زيي مت متي ملو ، عمجت
- وأ LAN ةكبش لي ئاقل لل لي غشتلا لال خ نم امإ يساسألا ددعتملا ثبلا نيوكت بجي ةينبلا ددعتملا ثبلا لمع ريس تاي لمع نم أي نيوكت متي ال . يوديلا نيوكتلا ايئاقلا ددعتملا ثبلا ةيساسألا .



ةيفيك ريغت ىلإ اذه يدؤي ، arp-nd قفدت نيكمتو يساسألا ددعتملا ثبلا نيوكت درجم نإ ام . LISP/ISF ىلإ ةدنتسمللا ةقدلا لصالا يف مدختسي ناك يذلاو ، ARP ب ل ط ةجل اع م في IPDT LISP-ARP-RELAY-VLAN ل ا زج عي اذه ، لاثم L2 LISP ل ا تحت تل كش نو كي arp-nd ضيفي لمعتسي ال ، VLAN ل ا ةساي س .

<#root>

Edge-1#

show device-tracking policies vlan 1026

Target	Type	Policy	Feature	Target range
vlan 1026	VLAN	DT-PROGRAMMATIC	Device-tracking	vlan all
vlan 1026	VLAN	LISP-DT-GLEAN-VLAN-MULTI-IP	Device-tracking	vlan all

رمغلا راسمل ARP ب ل ط نم ققحتلا

Edge-1 (10.47.1.12)

مل، لكشي arp-nd نافوط عم VLAN نكمم ل L2 ناضي في في ليمع ل نم ARP بلط يقلت دع ب  
ة دحوي تح ARP بلط يلع رظح ضرف متي. ARP يلع لفطت لة طساوب هتجل اع م متي دع ي  
هيجوت لة دواع ل س ي ل نكل و IPDT ملعت ضارغ أ لة يزك رمل لة جل اع ل

show platform arpsnooping client <MAC address> رمل ل م ادخت ساب هت يور نكم ي يذل او، ARP بلط لة جل اع م ب ARP ح فصتم موق ي ال  
arpsnooping client <MAC address>

<#root>

Edge-1#

```
show platform arpsnooping client 5254.0019.93e9
```

```
PLAT_DAI      : Platform DAI shim
FWDPLANE     : Dataplane forwarding
BRIDGE       : Packet to be bridged
ARPSN        : Arp Snooping
Packet Trace for client MAC 5254.0019.93E9:
```

Timestamp	Sender Mac	Sender IP	Target Mac	Target IP	Opcode
Filtered entries counters:					
ARPSN_FILTER_SVI: 0					

جارخ ال ا في حضوم وه امك 10.47.4.3 لة هان لة طقن ل RMT IPDT ل ادخ ل ا عاشن اب Edge-1 موق ي ال

<#root>

Edge-1#

```
show monitor capture 1 buffer display-filter arp brief
```

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

```
1 0.000000 52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP 60 Who has 10.47.4.3? Tell 10.47.4.2
```

Edge-1#

```
show device-tracking database address 10.47.4.3
```

```
Codes: L - Local, S - Static, ND - Neighbor Discovery, ARP - Address Resolution Protocol, DH4 - IPv4 DHCP
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	ag
-----------------------	--------------------	-----------	------	-------	----

عم راسم هل Edge-1 multicast. Edge-1 تحت لة عاذل ل ل خاد فلغي VXLAN بلط ل ARP ل ا، ن ال  
لوعومجم اهتحت لوعومجم ل ا ث ب لوعومجم ل ا، ر دصمك Loopback0

<#root>

Edge-1#

show run int lo0

Building configuration...

Current configuration : 135 bytes

```
!  
interface Loopback0  
 ip address 10.47.1.12 255.255.255.255  
 no ip redirects  
  
 ip pim sparse-mode <-- PIM must be enabled  
  
 ip router isis  
 clns mtu 1400  
end
```

<#root>

Edge-1#

show ip mroute 239.0.17.2

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

```
(*, 239.0.17.2), 5w1d/00:02:05, RP 10.47.1.14, flags: SJC  
 Incoming interface: GigabitEthernet1/0/2, RPF nbr 10.47.1.4  
 Outgoing interface list:  
 L2LISP0.8190, Forward/Sparse-Dense, 01:56:41/00:00:18, flags:  
 L2LISP0.8192, Forward/Sparse-Dense, 2w2d/00:00:58, flags:  
 L2LISP0.8188, Forward/Sparse-Dense, 5w1d/00:01:58, flags:
```

(

10.47.1.12

, 239.0.17.2), 00:02:53/00:00:06, flags: PFT

<-- Lo0 interface of Edge-1

Incoming interface:



```
Null0
```

```
, RPF nbr 0.0.0.0,
```

```
<-- Incoming interface Null0 is expected
```

```
Outgoing interface list:
```

```
GigabitEthernet1/0/2
```

```
, Forward/Sparse, 00:04:40/00:02:45, flags:
```

```
<-- Outgoing interface Gig1/0/2 faces the fabric underlay
```

هسفن قارغإ نم الدب IPDT/ISF عم (ARP) نيوانعلا ليلحت لوكوتورب لزاغتې، رمألا عقاوي فو نم LISP AR ةسايس ليطعت يه ةعدخلال نكلو، ثبال تايلمع لعفلاب ضيفي L2 ضيف رخآ ثب ياً لثم امامت اهقارغإ نكمي و ARP ةيكلم قالطإ نألا مت دقو، ةزهجالا بقعت

```
show platform software dpidb l2lisp <L2 LISP IID>
```

```
<#root>
```

```
Edge-1#
```

```
show platform software dpidb l2lisp 8190
```

```
Instance Id:8190,
```

```
dpidx:25
```

```
, vlan:1026, Parent Interface:L2LISP0(if_id:23)
```

```
<-- dpidx value used in the next command
```

```
show platform software fed switch active ifm if-id <dpidx value>
```

```
<#root>
```

```
Edge-1#
```

```
show platform software fed switch active ifm if-id 25
```

```
Interface IF_ID      : 0x00000000000000019
Interface Name       : L2LISP0.8190
Interface Block Pointer : 0x7f65ec85ba78
Interface Block State  : READY
Interface State       : Enabled
Interface Status      : ADD, UPD
Interface Ref-Cnt     : 2
Interface Type        : L2_LISP
Created Time          : 2023/09/19 17:57:32.046
```



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

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

```
1 0.000000 52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP
```

```
110
```

```
Who has 10.47.4.3? Tell 10.47.4.2
```

```
<-- Size 110 because VXLAN, UDP, and other headers
```

بجاء ARP فلغني VXLAN لى لى بقرقاً ةرطن تي قى لى عى طتسى تنأ

```
<#root>
```

```
Edge-1#
```

```
show monitor capture 1 buffer display-filter frame.number==1 detailed
```

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

```
Frame 1: 110 bytes on wire (880 bits), 110 bytes captured (880 bits) on interface /tmp/epc_ws/wif_to_ts
```

```
Interface id: 0 (/tmp/epc_ws/wif_to_ts_pipe)
```

```
Interface name: /tmp/epc_ws/wif_to_ts_pipe
```

```
Encapsulation type: Ethernet (1)
```

```
Arrival Time: Oct 25, 2023 20:44:36.578645000 UTC
```

```
[Time shift for this packet: 0.000000000 seconds]
```

```
Epoch Time: 1698266676.578645000 seconds
```

```
[Time delta from previous captured frame: 0.000000000 seconds]
```

```
[Time delta from previous displayed frame: 0.000000000 seconds]
```

```
[Time since reference or first frame: 0.000000000 seconds]
```

```
Frame Number: 1
```

```
Frame Length: 110 bytes (880 bits)
```

```
Capture Length: 110 bytes (880 bits)
```

```
[Frame is marked: False]
```

```
[Frame is ignored: False]
```

```
[Protocols in frame: eth:ethertype:ip:udp:vxlan:eth:ethertype:arp]
```

```
Ethernet II, Src: 00:00:00:00:00:00 (
```

```
00:00:00:00:00:00
```

```
), Dst: 00:00:00:00:00:00 (
```

```
00:00:00:00:00:00
```

```
)
```

```
<-- Ignore the all 0s MAC, not accurate
```

```
Destination: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
Address: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
.... ..0. .... = LG bit: Globally unique address (factory default)
```

```
.... ..0. .... = IG bit: Individual address (unicast)
```

```
Source: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
Address: 00:00:00:00:00:00 (00:00:00:00:00:00)
```

```
.... ..0. .... = LG bit: Globally unique address (factory default)
```

```
.... ..0. .... = IG bit: Individual address (unicast)
```

```
Type: IPv4 (0x0800)
```

```
Internet Protocol Version 4,
```

```
Src: 10.47.1.12, Dst: 239.0.17.2 <-- Source is Edge-1 RLOC, Destination is the broadcast underlay group
```

```
0100 .... = Version: 4
.... 0101 = Header Length: 20 bytes (5)
Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    0000 00.. = Differentiated Services Codepoint: Default (0)
        .... ..00 = Explicit Congestion Notification: Not ECN-Capable Transport (0)
Total Length: 96
Identification: 0x8dab (36267)
Flags: 0x4000, Don't fragment
    0... .... = Reserved bit: Not set
    .1.. .... = Don't fragment: Set
    ..0. .... = More fragments: Not set
Fragment offset: 0
Time to live: 255
Protocol: UDP (17)
Header checksum: 0xe2a3 [validation disabled]
[Header checksum status: Unverified]
Source: 10.47.1.12
Destination: 239.0.17.2
User Datagram Protocol, Src Port: 65280, Dst Port: 4789
Source Port: 65280
Destination Port: 4789
Length: 76
[Checksum: [missing]]
[Checksum Status: Not present]
[Stream index: 0]
[Timestamps]
    [Time since first frame: 0.000000000 seconds]
    [Time since previous frame: 0.000000000 seconds]
```

```
Virtual eXtensible Local Area Network
Flags: 0x8800, GBP Extension, VXLAN Network ID (VNI)
    1... .... = GBP Extension: Defined
    .... ..0.. .... = Don't Learn: False
    .... 1... .... = VXLAN Network ID (VNI): True
    .... .... 0... = Policy Applied: False
    .000 .000 0.00 .000 = Reserved(R): 0x0000
Group Policy ID: 0
```

**VXLAN Network Identifier (VNI): 8190 <-- L2 LISP IID**

```
Reserved: 0
Ethernet II, Src: 52:54:00:19:93:e9 (
52:54:00:19:93:e9
), Dst: ff:ff:ff:ff:ff:ff (
ff:ff:ff:ff:ff:ff
)
```

**<-- SMAC and DMAC of the ARP Request**

```
Destination: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)
Address: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)
    .... ..1. .... = LG bit: Locally administered address (this is NOT the factory d
    .... ...1 .... = IG bit: Group address (multicast/broadcast)
Source: 52:54:00:19:93:e9 (52:54:00:19:93:e9)
Address: 52:54:00:19:93:e9 (52:54:00:19:93:e9)
    .... ..1. .... = LG bit: Locally administered address (this is NOT the factory d
    .... ...0 .... = IG bit: Individual address (unicast)
Type: ARP (0x0806)
Trailer: 00000000000000000000000000000000
Address Resolution Protocol (request)
Hardware type: Ethernet (1)
```

```

Protocol type: IPv4 (0x0800)
Hardware size: 6
Protocol size: 4
Opcode: request (1)
Sender MAC address: 52:54:00:19:93:e9 (
52:54:00:19:93:e9
)
Sender IP address:
10.47.4.2
Target MAC address: 00:00:00:00:00:00 (
00:00:00:00:00:00
)
Target IP address:
10.47.4.3

```

## Edge-2 (10.47.1.13)

تم زح ملتس ي و، Edge-1 ل S,G ل كلتم ي و 239.0.17.2، ي ساس ال ثبل ال ع و م ح م ي ل Edge-2 م ض ن ي  
 ة ه ا و ال ة م ئ ا ق ي ف ة د و ح و م ال LISP0.8190 و Gig1/0/1 ي ل ع VXLAN ف ل غ م ل د د ع ت م ل ث ب ل  
 ة ه ا و ن م ال د ب ق ف ن ة ه ا و م د ق ال و 17.3 ل ث م ز م ر ل ن م م د ق ال ت ا ر ا د ص ال م د خ ت س ت . ة ر د ا ص ال  
 LISP0 ال ر ف ل .

<#root>

Edge-2#

```
show ip mroute 239.0.17.2
```

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

```

(*, 239.0.17.2), 5w1d/stopped, RP 10.47.1.14, flags: SJC
Incoming interface: GigabitEthernet1/0/1, RPF nbr 10.47.1.6
Outgoing interface list:
L2LISP0.8190, Forward/Sparse-Dense, 02:28:57/00:01:02, flags:

```

```
L2LISP0.8192, Forward/Sparse-Dense, 2w2d/00:00:32, flags:
L2LISP0.8188, Forward/Sparse-Dense, 5w1d/00:02:54, flags:
```

```
(10.47.1.12, 239.0.17.2), 00:00:03/00:02:56, flags: JT
Incoming interface:
```

```
GigabitEthernet1/0/1
```

```
, RPF nbr 10.47.1.6
```

```
<-- Interface that faces the fabric underlay and the RPF interface towards 10.47.1.12
```

```
Outgoing interface list:
```

```
L2LISP0.8188, Forward/Sparse-Dense, 00:00:03/00:02:56, flags:
L2LISP0.8192, Forward/Sparse-Dense, 00:00:03/00:02:56, flags:
```

```
L2LISP0.8190, Forward/Sparse-Dense, 00:00:03/00:02:56, flags:
```

VLAN لڤاد طبرلا ضيفي و سار VXLAN ل لصفني، طبر فلغي VXLAN ل Edge-2 ملتسي  
1026، اياهنل هجاوي نراقل as well as مDAQ نراقل ل ع EPC في تي ار تنك عي طتسي اي 1026.

```
<#root>
```

```
Edge-2#
```

```
monitor capture 1 interface gig1/0/1 in match any
```

```
Edge-2#
```

```
monitor capture 1 int g1/0/3 out
```

```
Edge-2#
```

```
monitor capture 1 start
```

```
Started capture point : 1
```

```
Edge-2#
```

```
monitor capture 1 stop
```

```
Capture statistics collected at software:
```

```
Capture duration - 22 seconds
Packets received - 43
Packets dropped - 0
Packets oversized - 0
```

```
Number of Bytes dropped at asic not collected
```

```
Capture buffer will exists till exported or cleared
```

```
Stopped capture point : 1
```

```
Edge-2#
```

```
show monitor capture 1 buffer display-filter arp
```

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

```
10 6.230153 52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP
110
Who has 10.47.4.3? Tell 10.47.4.2
<-- Size 110 is the VXLAN encapsulated ARP Request
11 6.404781 52:54:00:19:93:e9 -> ff:ff:ff:ff:ff:ff ARP
60
Who has 10.47.4.3? Tell 10.47.4.2
<-- Size 60 is the original ARP Request
```

## رمغلا راسمل ARP در ةحص نم ققحتلا

ARP دودرلة بسننلاب . ةيناچم ARP نكت مل ام ، ثبلا ةيداحا ابيرقت امئاد ARP دودر نوكت راسم وأ LISP/ISF ىل اءانتسا Unicast راسمل لمعلا ريس نيب زييمت دجوي ال ، يداحالا ثبلل يذلا يداحالا ثبلا راسم سفن امهالك مدختسي ، قفدتلل ARP-ND ىل دننتمل ضيفتلا راسم بصاخلا ARP در نم ققحتلا مسق نم ةءافتسالا كنكمي . ISF/IPDT فاشتك نمضتي اءالصال وءاطخال فاشكتسال يداحالا ثبلا

ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن م ة و مچ م ادخت ساب دن تسمل اذ ه Cisco ت مچرت  
ملاعلاء نأ عي مچ ي ف ن ي م دخت سمل ل معد ي و تح م مي دقت ل ة ي رش ب ل و  
امك ة ق ي قد ن و ك ت ن ل ة ي ل ة مچرت ل ض ف أن ة ظ حال م ي ج ر ي . ة ص ا خ ل 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 ئ 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 (رف و ت م ط بار ل ا) ي ل ص أ ل ا ي ز ي ل ج ن إ ل ا دن تسمل ا