

# 在Nexus上配置LISP多跳移動性

## 目錄

[簡介](#)

[必要條件](#)

[需求](#)

[採用元件](#)

[背景資訊](#)

[設定](#)

[網路圖表](#)

[West-DC](#)

[East-DC](#)

[MS/MR](#)

[站點3](#)

[操作順序](#)

[驗證](#)

[疑難排解](#)

## 簡介

本文描述在啟用定位器身份分離協定(LISP)的網路中跨資料中心(DC)移動的IP裝置的配置和驗證，無需更改其IP地址。

## 必要條件

### 需求

思科建議您瞭解LISP的基本知識。

### 採用元件

本文件所述內容不限於特定軟體和硬體版本。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

## 背景資訊

在LISP環境中，此裝置稱為動態端點識別符號(EID)。LISP多跳移動支援子網擴展模式，該模式允許不同的DC具有相同的子網，從而允許虛擬機(VM)在遷移到其他DC時保留其分配的IP地址。

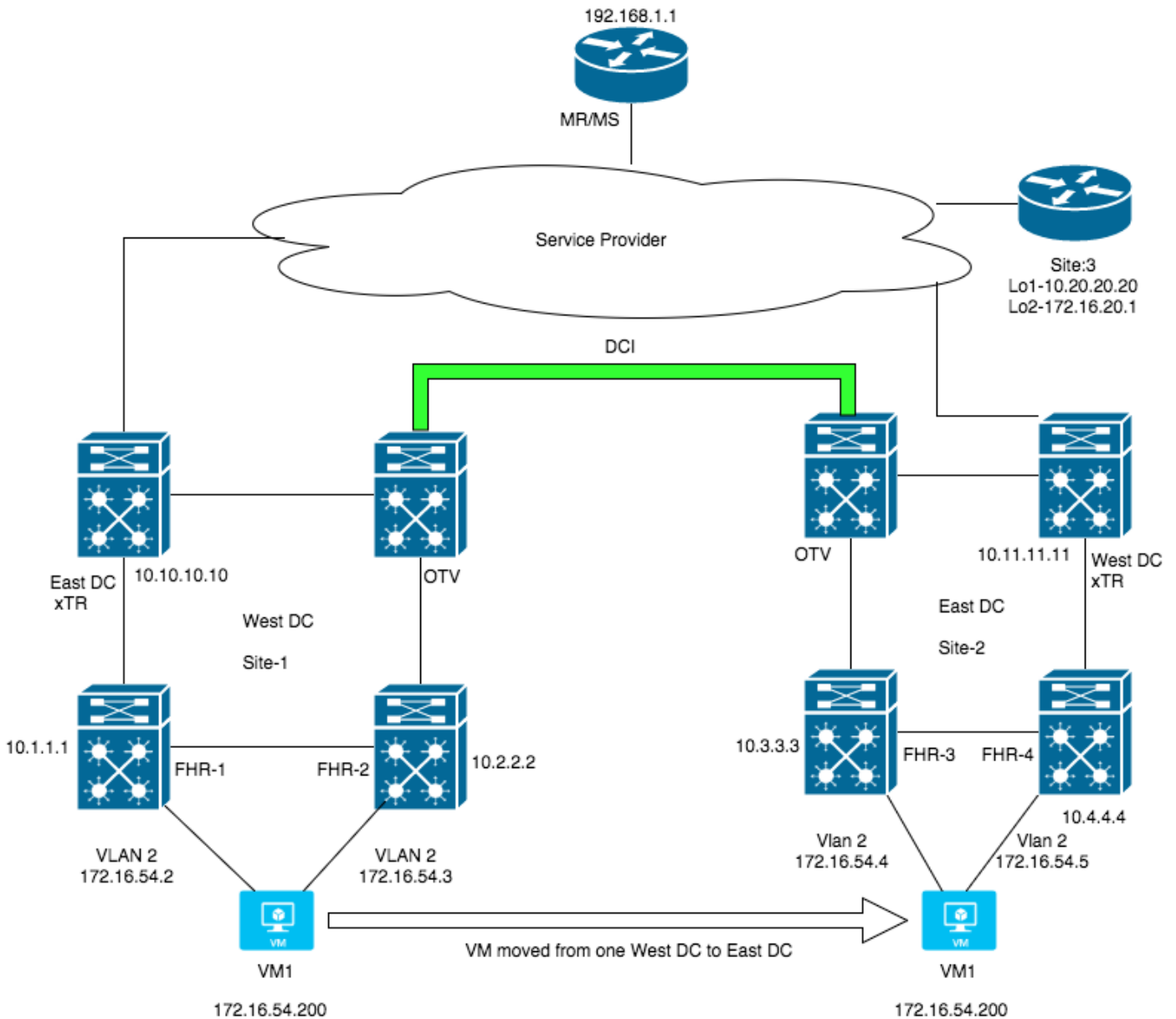
第一跳路由器(FHR)檢測動態EID的存在，並通過EID通知消息將其通知給xTR側網關。xTR註冊動態EID以對映伺服器，並對通過LISP域的流量執行LISP封裝和解除封裝功能。

部署在不同資料中心的xTR必須通過資料中心互聯(DCI)技術(如重疊傳輸虛擬化(OTV))進行連線。在Nexus中，支援OTV組播模式。

## 設定

### 網路圖表

此影象用作文檔其餘部分的示例拓撲。



- xTR:LISP路由器可以是ITR或ETR，具體取決於流量流方向。如果流量從LISP路由器發出，則它成為該流量的ITR，接收端LISP路由器成為該路由器的ETR。
- ITR:輸入通道路由器
- ETR:輸出通道路由器
- 對映解析器(MR)：對映解析器是LISP基礎結構裝置，當您解析EID到RLOC的對映時，LISP站點ITR會將LISP對映請求查詢傳送到該裝置。

- 對映伺服器(MS):對映伺服器是LISP站點ETR向其註冊其EID字首的LISP基礎結構裝置。對映伺服器向LISP對映系統通告已註冊EID字首的聚合。所有LISP站點都使用LISP對映系統來解析EID到RLOC的對映。
- EID地址：EID地址由標識終端的IP地址和字首組成。通過解析EID到RLOC的對映，可以跨LISP站點實現EID可達性。
- 路由定位器(RLOC)地址：RLOC地址由標識IP網路中不同路由器的IP地址和字首組成。RLOC空間內的可達性是通過傳統的路由方法實現的。
- SMR:Solicit-map-request;控制平面消息，用於通知遠端xTR更新其快取的對映。
- ASM:跨子網模式；允許在不部署第2層擴展的情況下在LISP站點之間進行EID移動。
- Map-Notify:LISP消息，由檢測到EID的xTR使用，用於更新同一LISP站點中關於該發現的其他xTR。對映伺服器還使用該對映來確認已接收和處理對映暫存器。
- Map-Register:xTR使用LISP消息在對映伺服器中註冊EID。

在本文討論的示例中，流量從VM(172.16.54.200)持續流向站點3(172.16.20.1)。

## West-DC

### 第一躍點路由器(FHR-1):

```

!
feature lisp
!
ip lisp etr
!
lisp dynamic-eid VM
  database-mapping 172.16.54.0/24 10.1.1.1 priority 10 weight 50
  database-mapping 172.16.54.0/24 10.2.2.2 priority 10 weight 50
  eid-notify 10.10.10.10 key 3 9125d59c18a9b015
  map-notify-group 225.1.1.1
!
interface loopback0
  ip address 10.1.1.1/32
  ip router ospf 1 area 0.0.0.0
!
interface Vlan2
  no shutdown
  lisp mobility VM
  lisp extended-subnet-mode
  ip address 172.16.54.3/24
  ip ospf passive-interface
  ip router ospf 1 area 0.0.0.0
  ip pim sparse-mode
  no ip arp gratuitous request
  hsrp 1
    preempt
    priority 120
    ip 172.16.54.1
!

```

### FHR-2:

```
!  
feature lisp  
!  
ip lisp etr  
!  
lisp dynamic-eid VM  
  database-mapping 172.16.54.0/24 10.1.1.1 priority 10 weight 50  
  database-mapping 172.16.54.0/24 10.2.2.2 priority 10 weight 50  
  eid-notify 10.10.10.10 key 3 9125d59c18a9b015  
  map-notify-group 225.1.1.1  
!  
interface Vlan2  
  no shutdown  
  lisp mobility VM  
  lisp extended-subnet-mode  
  ip address 172.16.54.2/24  
  ip ospf passive-interface  
ip pim sparse-mode  
no ip arp gratuitous request  
hsrp 1  
  preempt  
  priority 90  
  ip 172.16.54.1  
!  
interface loopback0  
  ip address 10.2.2.2/32  
  ip router ospf 1 area 0.0.0.0
```

## xTR:

```
!  
feature lisp  
!  
ip lisp itr-etr  
ip lisp database-mapping 172.16.54.0/24 10.10.10.10 priority 10 weight 50  
ip lisp itr map-resolver 192.168.1.1  
ip lisp etr map-server 192.168.1.1 key 3 9125d59c18a9b015  
!  
lisp dynamic-eid VM  
  database-mapping 172.16.54.0/24 10.10.10.10 priority 10 weight 50  
  eid-notify authentication-key 3 9125d59c18a9b015  
!  
interface loopback0  
  ip address 10.10.10.10/32  
  ip router ospf 1 area 0.0.0.0  
!
```

## East-DC

### FHR-3:

```
!  
feature lisp  
!  
ip lisp etr  
!  
lisp dynamic-eid VM  
  database-mapping 172.16.54.0/24 10.3.3.3 priority 10 weight 50
```

```
database-mapping 172.16.54.0/24 10.4.4.4 priority 10 weight 50
eid-notify 10.11.11.11 key 3 9125d59c18a9b015
```

```
map-notify-group 225.1.1.1
```

```
!
interface Vlan2
no shutdown
lisp mobility VM
  lisp extended-subnet-mode
ip address 172.16.54.4/24
ip ospf passive-interface
ip router ospf 1 area 0.0.0.0
ip pim sparse-mode
no ip arp gratuitous request
hsrp 1
  preempt
  priority 110
  ip 172.16.54.1
```

```
!
interface loopback0
ip address 10.3.3.3/32
ip router ospf 1 area 0.0.0.0
```

#### FHR-4:

```
!
feature lisp
!
ip lisp etr
!
lisp dynamic-eid VM
database-mapping 172.16.54.0/24 10.3.3.3 priority 10 weight 50
database-mapping 172.16.54.0/24 10.4.4.4 priority 10 weight 50
eid-notify 10.11.11.11 key 3 9125d59c18a9b015
map-notify-group 225.1.1.1
```

```
!
interface Vlan2
no shutdown
lisp mobility VM
  lisp extended-subnet-mode
ip pim sparse-mode
ip ospf passive-interface
ip address 172.16.54.5/24
hsrp 1
  preempt
  priority 90
  ip 172.16.54.1
!
interface loopback0
ip address 10.4.4.4/32
ip router ospf 1 area 0.0.0.0
```

#### xTR:

```
!
interface loopback0
ip address 10.11.11.11/32
ip router ospf 1 area 0.0.0.0
!
feature lisp
!
ip lisp itr-etr
ip lisp database-mapping 172.16.54.0/24 10.11.11.11 priority 10 weight 50
```

```
ip lisp itr map-resolver 192.168.1.1
ip lisp etr map-server 192.168.1.1 key 3 9125d59c18a9b015
!
lisp dynamic-eid VM
  database-mapping 172.16.54.0/24 10.11.11.11 priority 9 weight 50
  eid-notify authentication-key 3 9125d59c18a9b015
!
```

## MS/MR

```
!
router lisp
  locator-table default
  site 1
    authentication-key cisco
    eid-prefix 172.16.54.0/24 accept-more-specifics
  exit
  !
  site 2
    authentication-key cisco
    eid-prefix 172.16.20.0/24 accept-more-specifics
  exit
  !
  ipv4 map-server
  ipv4 map-resolver
```

## 站點3

```
!
router lisp
  database-mapping 172.16.20.0/24 10.20.20.20 priority 10 weight 50
  ipv4 itr map-resolver 192.168.1.1
  ipv4 itr
  ipv4 etr map-server 192.168.1.1 key cisco
  ipv4 etr
  exit
!
interface Loopback1
  ip address 10.20.20.20 255.255.255.255
!
interface Loopback2
  ip address 172.16.20.1 255.255.255.0
!
```

## 操作順序

步驟1.啟動VM。

VM已通電並開始向遠端站點 ( 即Site-3 ) 傳送流量。 FHR-1收到此流並建立動態EID:

```
N7K-358-West-FHR1# show lisp dynamic-eid summary
```

```
LISP Dynamic EID Summary for VRF "default"
* = Dyn-EID learned by site-based Map-Notify
! = Dyn-EID learned by routing protocol
^ = Dyn-EID learned by EID-Notify
```

Dyn-EID Name	Dynamic-EID	Interface	Uptime	Last Packet	Pending Ping Count
VM	172.16.54.200	Vlan2	06:50:21	00:12:12	0

```

N7K-358-West-FHR1# show lisp dynamic-eid detail
LISP Dynamic EID Information for VRF "default"
Dynamic-EID name: VM
Database-mapping [0] EID-prefix: 172.16.54.0/24, LSBs: 0x00000003
Locator: 10.1.1.1, priority: 10, weight: 50
Uptime: 06:51:34, state: up, local
Locator: 10.2.2.2, priority: 10, weight: 50
Uptime: 06:50:10, state: up
Registering more-specific dynamic-EIDs
Registering routes: disabled
Map-Server(s): none configured, use global Map-Server
Site-based multicast Map-Notify group: 225.1.1.1
Extended Subnet Mode configured on 1 interfaces
Number of roaming dynamic-EIDs discovered: 3
Last dynamic-EID discovered: 172.16.54.1, 00:00:04 ago
Roaming dynamic-EIDs:
172.16.54.200, Vlan2, uptime: 06:50:31, last activity: 00:12:22
Discovered by: packet reception

```

## 步驟2. FHR安裝LISP路由。

如步驟1所示，FHR在收到來自VM的資料包時會建立一個動態EID條目。然後在路由資訊庫(RIB)中安裝a/32路由：

```

N7K-358-FHR1-West-DC# show ip route 172.16.54.200
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
 '**' denotes best mcast next-hop
 '[x/y]' denotes [preference/metric]
 '%<string>' in via output denotes VRF <string>

172.16.54.200/32, ubest/mbest: 1/0, attached
 *via 172.16.54.200, Vlan2, [240/0], 06:58:08, lisp, dyn-eid
  via 172.16.54.200, Vlan2, [250/0], 06:58:45, am

```

## 步驟3. FHR通知所有其他FHR有關此動態EID。

此FHR向所有其他FHR（包括本地站點以及所有遠端站點中的FHR）傳送對映通知消息。在我們的示例中，FHR-1將有關172.16.54.200的Map-Notify傳送到本地DC上的FHR-2以及東DC上的FHR-3和FHR-4。

但只有本地站點FHR可以在其RIB中安裝該EID的路由，如下所示：

```

N7K-358-FHR2-West-DC# show lisp dynamic-eid detail
LISP Dynamic EID Information for VRF "default"
Dynamic-EID name: VM
Database-mapping [0] EID-prefix: 172.16.54.0/24, LSBs: 0x00000003
Locator: 10.1.1.1, priority: 10, weight: 50
Uptime: 00:01:04, state: up
Locator: 10.2.2.2, priority: 10, weight: 50
Uptime: 00:01:53, state: up, local
Registering more-specific dynamic-EIDs
Registering routes: disabled
Map-Server(s): none configured, use global Map-Server
Site-based multicast Map-Notify group: 225.1.1.1
Extended Subnet Mode configured on 1 interfaces
Number of roaming dynamic-EIDs discovered: 1
Last dynamic-EID discovered: 172.16.54.200, 00:01:04 ago
Roaming dynamic-EIDs:

```

172.16.54.200, Vlan2, uptime: 00:01:04, last activity: 00:00:42

**Discovered by: site-based Map-Notify**

Secure-handoff pending for sources: none

**N7K-358-FHR2-West-DC#sh ip route 172.16.54.200**

IP Route Table for VRF "default"

'\*' denotes best ucast next-hop

\*\*\*' denotes best mcast next-hop

'[x/y]' denotes [preference/metric]

'%<string>' in via output denotes VRF <string>

172.16.54.200/32, ubest/mbest: 1/0, attached

\*via 172.16.54.200, Vlan2, [240/0], 00:00:08, lisp, dyn-eid

via 172.16.54.200, Vlan2, [250/0], 00:01:53, am

步驟4. FHR將此EID更新為本地xTR。

當FHR上的兩個站點都知道EID時，它會通知其本地站點的xTR有關此EID（使用EID-Notify消息）。

East DC xTR路由器也為此字首安裝空的0路由，而West DC xTR在RIB中新增此字首。

**N7K-FA8-East\_xTR#show ip route 172.16.54.200**

IP Route Table for VRF "default"

'\*' denotes best ucast next-hop

\*\*\*' denotes best mcast next-hop

'[x/y]' denotes [preference/metric]

'%<string>' in via output denotes VRF <string>

172.16.54.200/32, ubest/mbest: 1/0, attached

\*via 172.16.54.200, **Null0**, [241/0], 00:00:32, lisp, dyn-eid

**N7K-358-West\_xTR#show lisp dynamic-eid detail**

LISP Dynamic EID Information for VRF "default"

Dynamic-EID name: VM

Database-mapping [0] EID-prefix: 172.16.54.0/24, LSBs: 0x00000001

Locator: 10.10.10.10, priority: 10, weight: 50

Uptime: 00:02:37, state: up, local

Registering more-specific dynamic-EIDs

Registering routes: disabled

Map-Server(s): none configured, use global Map-Server

Site-based multicast Map-Notify group: none configured

Number of roaming dynamic-EIDs discovered: 1

Last dynamic-EID discovered: 172.16.54.1, 00:00:06 ago

Roaming dynamic-EIDs:

172.16.54.200, (null), uptime: 00:00:28, last activity: 00:00:06

**Discovered by: EID-Notify**

EID-Notify Locators:

10.1.1.1

10.2.2.2

**N7K-358-West\_xTR#sh ip route 172.16.54.200**

IP Route Table for VRF "default"

'\*' denotes best ucast next-hop

\*\*\*' denotes best mcast next-hop

'[x/y]' denotes [preference/metric]

'%<string>' in via output denotes VRF <string>

172.16.54.0/24, ubest/mbest: 1/0

via 10.10.13.3, Eth3/2, [110/44], 00:01:00, ospf-1, intra



本地xTR向MR/MS註冊EID:

East DC xTR還向MR/MS傳送對映註冊消息，並向它們註冊這個新發現的EID。Site-3路由器也是如此。

```
MS_MR#show lisp site 172.16.54.200/32
```

```
LISP Site Registration Information
```

```
Site name: 1
```

```
Allowed configured locators: any
```

```
Requested EID-prefix:
```

```
EID-prefix: 172.16.54.200/32
```

```
First registered: 07:11:28
```

```
Routing table tag: 0
```

```
Origin: Dynamic, more specific of 172.16.54.0/24
```

```
Merge active: No
```

```
Proxy reply: No
```

```
TTL: 00:03:00
```

```
State: complete
```

```
Registration errors:
```

```
Authentication failures: 0
```

```
Allowed locators mismatch: 0
```

```
ETR 10.10.90.1, last registered 00:00:07, no proxy-reply, map-notify
```

```
TTL 00:03:00, no merge, hash-function sha1, nonce 0x00000000-0x00000000
```

```
state complete, no security-capability
```

```
xTR-ID N/A
```

```
site-ID N/A
```

Locator	Local	State	Pri/Wgt	Scope
10.10.10.10	yes	up	10/50	IPv4 none

```
MS_MR#sh lisp site 172.16.20.0/24
```

```
LISP Site Registration Information
```

```
Site name: 2
```

```
Allowed configured locators: any
```

```
Requested EID-prefix:
```

```
EID-prefix: 172.16.20.0/24
```

```
First registered: 06:30:48
```

```
Routing table tag: 0
```

```
Origin: Configuration, accepting more specifics
```

```
Merge active: No
```

```
Proxy reply: No
```

```
TTL: 1d00h
```

```
State: complete
```

```
Registration errors:
```

```
Authentication failures: 0
```

```
Allowed locators mismatch: 0
```

```
ETR 10.10.67.7, last registered 00:00:23, no proxy-reply, map-notify
```

```
TTL 1d00h, no merge, hash-function sha1, nonce 0xEE339164-0xC3199AF1
```

```
state complete, no security-capability
```

```
xTR-ID 0x7C6C7CF6-0x2AE64A0C-0xDCBC62DA-0x79762795
```

```
site-ID unspecified
```

Locator	Local	State	Pri/Wgt	Scope
10.20.20.20	yes	up	10/50	IPv4 none

步驟5.檢驗站點1和站點3 xTR上的流量：

```
N7K-358-West_xTR# show ip lisp map-cache
```

```
LISP IP Mapping Cache for VRF "default" (iid 0), 3 entries
```

```
* = Locator data counters are cumulative across all EID-prefixes
```

```
0.0.0.0/1, uptime: 00:13:28, expires: 00:01:31, via map-reply
```

```
Negative cache entry, action: forward-native
```

```
128.0.0.0/3, uptime: 00:13:28, expires: 00:01:31, via map-reply  
Negative cache entry, action: forward-native
```

```
172.16.20.0/24, uptime: 00:00:26, expires: 23:59:33, via map-reply, auth  
Locator      Uptime      State      Priority/  Data      Control      MTU  
              Uptime      State      Weight    in/out    in/out  
10.20.20.20  00:00:26  up         10/50     0/0*     0/0         1500
```

站點3 LISP對映快取條目：

```
Site-3#show ip lisp map-cache
```

```
LISP IPv4 Mapping Cache for EID-table default (IID 0), 2 entries
```

```
0.0.0.0/0, uptime: 01:53:04, expires: never, via static send map-request  
Negative cache entry, action: send-map-request
```

```
172.16.54.200/32, uptime: 01:50:02, expires: 22:09:57, via map-reply, complete
```

```
Locator      Uptime      State      Pri/Wgt  
10.10.10.10  01:50:02  up         10/50
```

步驟6. VM從West DC移至East DC。

這些步驟是在DC之間進行VM遷移之前執行的。現在，VM從West DC移動到East DC，無需更改IP地址。當VM從West DC移動到East DC時，East DC的FHR-3收到來自VM的資料包，並將其IP地址新增到動態EID表中。然後，它將對映通知請求傳送到包括West DC的所有FHR，並且West DC收到對映通知請求後，會從West DC中存在虛擬機器時建立的動態EID表中刪除VM條目。West DC的xTR現在將空0路由安裝到VM的IP。

以下是東部DC的FHR-3上的動態EID狀態：

```
N7K-FA8-East_FHR3# sh lisp dynamic-eid detail
```

```
LISP Dynamic EID Information for VRF "default"
```

```
Dynamic-EID name: VM
```

```
Database-mapping [0] EID-prefix: 172.16.54.0/24, LSBs: 0x00000003
```

```
Locator: 10.3.3.3, priority: 10, weight: 50
```

```
Uptime: 02:04:48, state: up, local
```

```
Locator: 10.4.4.4, priority: 10, weight: 50
```

```
Uptime: 02:03:27, state: up
```

```
Registering more-specific dynamic-EIDs
```

```
Registering routes: disabled
```

```
Map-Server(s): none configured, use global Map-Server
```

```
Site-based multicast Map-Notify group: 225.1.1.1
```

```
Extended Subnet Mode configured on 1 interfaces
```

```
Number of roaming dynamic-EIDs discovered: 1
```

```
Last dynamic-EID discovered: 172.16.54.1, 00:00:14 ago
```

```
Roaming dynamic-EIDs:
```

```
172.16.54.200, Vlan2, uptime: 00:04:28, last activity: 00:03:11
```

```
Discovered by: packet reception
```

```
N7K-FA8-East_FHR3# sh ip route 172.16.54.200
```

```
IP Route Table for VRF "default"
```

```
'*' denotes best ucast next-hop
```

```
'**' denotes best mcast next-hop
```

```
'[x/y]' denotes [preference/metric]
```

```
'%<string>' in via output denotes VRF <string>
```

```
172.16.54.200/32, ubest/mbest: 1/0, attached
```

```
*via 172.16.54.200, Vlan2, [240/0], 00:05:00, lisp, dyn-eid
```

```
via 172.16.54.200, Vlan2, [250/0], 00:05:10, am
```

因此，West FHR沒有適用於VM的動態EID，即172.16.54.200:

```
N7K-358-West-FHR1(config)# sh lisp dynamic-eid summary
```

```
LISP Dynamic EID Summary for VRF "default"
* = Dyn-EID learned by site-based Map-Notify
! = Dyn-EID learned by routing protocol
^ = Dyn-EID learned by EID-Notify
Dyn-EID Name   Dynamic-EID   Interface   Uptime   Last       Pending
                Packet       Ping Count
VM              172.16.54.2   Vlan2       00:33:30 00:00:07  0
```

步驟7. West DC的xTR在路由表中新增了null 0條目：

```
N7K-358-West_xTR# sh ip route 172.16.54.200
```

```
IP Route Table for VRF "default"
'*' denotes best ucast next-hop
***' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
```

```
172.16.54.200/32, ubest/mbest: 1/0, attached
  *via 172.16.54.200, Null10, [241/0], 00:00:05, lisp, dyn-eid
```

步驟8. East xTR由FHR-3通過EID通知更新，然後East xTR向MS傳送帶有遷移的VM字首的對映暫存器：

```
N7K-FA8-East_xTR(config)# show lisp dynamic-eid Detail
```

```
LISP Dynamic EID Information for VRF "default"
Dynamic-EID name: VM
Database-mapping [0] EID-prefix: 172.16.54.0/24, LSBs: 0x00000001
  Locator: 10.11.11.11, priority: 9, weight: 50
    Uptime: 02:19:51, state: up, local
Registering more-specific dynamic-EIDs
Registering routes: disabled
Map-Server(s): none configured, use global Map-Server
Site-based multicast Map-Notify group: none configured
Number of roaming dynamic-EIDs discovered: 1
Last dynamic-EID discovered: 172.16.54.1, 00:00:58 ago
Roaming dynamic-EIDs:
  172.16.54.200, (null), uptime: 00:17:50, last activity: 00:00:25
    Discovered by: EID-Notify
    EID-Notify Locators:
      10.3.3.3
      10.4.4.4
```

```
MS_MR#sh lisp site 172.16.54.200
```

```
LISP Site Registration Information
Site name: 1
Allowed configured locators: any
Requested EID-prefix:
  EID-prefix: 172.16.54.200/32
    First registered: 02:02:24
    Routing table tag: 0
    Origin: Dynamic, more specific of 172.16.54.0/24
    Merge active: No
    Proxy reply: No
    TTL: 00:03:00
    State: complete
```

```

Registration errors:
  Authentication failures: 0
  Allowed locators mismatch: 0
ETR 10.11.17.1, last registered 00:00:32, no proxy-reply, map-notify
  TTL 00:03:00, no merge, hash-function sha1, nonce 0x00000000-0x00000000
  state complete, no security-capability
  xTR-ID N/A
  site-ID N/A
Locator      Local State      Pri/Wgt  Scope
10.11.11.11  yes   up         9/50    IPv4 none

```

步驟9.兩個xTR都可以更新對映快取條目。

在VM遷移之前，對於Site-3,VM的IP的RLOC為West xTR(10.10.10.10)。將VM遷移到East DC後，一旦West xTR收到來自Site-3的流量，它就會將SMR消息傳送到Site-3路由器，以便更新East xTR(10.11.11.11)的新RLOC地址，如下所示：

```

Site-3#sh ip lisp map-cache
LISP IPv4 Mapping Cache for EID-table default (IID 0), 2 entries

0.0.0.0/0, uptime: 02:03:23, expires: never, via static send map-request
  Negative cache entry, action: send-map-request
172.16.54.200/32, uptime: 02:00:22, expires: 23:57:56, via map-reply, complete
Locator      Uptime      State      Pri/Wgt
10.11.11.11  00:02:03   up         9/50

```

```

N7K-FA8-East_xTR(config)# show ip lisp map-cache
LISP IP Mapping Cache for VRF "default" (iid 0), 1 entries
* = Locator data counters are cumulative across all EID-prefixes

172.16.20.0/24, uptime: 00:25:24, expires: 23:34:35, via map-reply, auth
Locator      Uptime      State      Priority/  Data      Control      MTU
              Uptime      State      Weight    in/out    in/out
10.20.20.20  00:25:24   up         10/50     0/0*     0/0         1500

```

## 驗證

使用本節內容，確認您的組態是否正常運作。

驗證工作將在操作順序一節的步驟5中介紹。

## 疑難排解

本節提供的資訊可用於對組態進行疑難排解。

可以使用這些調試來排除受控環境中的LISP故障。

```

debug ip lisp mapping control

debug lisp mapping register

debug lisp smr

debug lisp ha

debug lisp loc-reach-algorithm receive-probe

```

```
debug lisp loc-reach-algorithm send-probe
```

```
debug ip mroute map_notify_addr 32 detail
```

```
debug ip lisp mapping data
```