



## **Cisco Nexus 7000 Series NX-OS LISP Command Reference**

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## CONTENTS

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### Preface

#### Preface ix

Preface ix

Audience ix

Document Conventions ix

Related Documentation xii

Documentation Feedback xiii

Obtaining Documentation and Submitting a Service Request xiii

---

### CHAPTER 1

#### A Commands 1

allowed-locator 2

authentication-key 4

---

### CHAPTER 2

#### C Commands 7

clear ip lisp data-cache 8

clear ip lisp map-cache 9

clear ip lisp statistics 11

clear ipv6 lisp data-cache 12

clear ipv6 lisp map-cache 13

clear ipv6 lisp statistics 15

clear lisp dynamic-eid 16

clear lisp proxy-itr 18

clear lisp site 20

---

### CHAPTER 3

#### D Commands 21

database-mapping 22

description 24

---

**CHAPTER 4****E Commands 25**

- eid-notify 26
- eid-prefix 28

---

**CHAPTER 5****I Commands 31**

- instance-id 34
- ip lisp alt-vrf 36
- ip lisp database-mapping 38
- ip lisp etr 41
- ip lisp etr accept-map-request-mapping 43
- ip lisp etr glean-mapping 45
- ip lisp etr map-cache-ttl 47
- ip lisp etr map-server 48
- ip lisp hardware-forwarding 51
- ip lisp itr 52
- ip lisp itr map-resolver 54
- ip lisp itr send-data-probe 56
- ip lisp itr-etr 58
- ip lisp locator-down 60
- ip lisp locator-vrf 62
- ip lisp map-cache 64
- ip lisp map-cache-limit 67
- ip lisp map-request-source 70
- ip lisp map-resolver 72
- ip lisp map-server 74
- ip lisp multicast 76
- ip lisp nat-transversal 77
- ip lisp proxy-etr 79
- ip lisp proxy-itr 81
- ip lisp shortest-eid-prefix-length 83
- ip lisp source-locator 85
- ip lisp translate 87
- ip lisp use-petr 89
- ip pim rp-address 91

ip pim ssm	92
ip route	93
ipv6 lisp alt-vrf	94
ipv6 lisp database-mapping	96
ipv6 lisp etr	99
ipv6 lisp etr accept-map-request-mapping	101
ipv6 lisp etr glean-mapping	103
ipv6 lisp etr map-cache-ttl	105
ipv6 lisp etr map-server	106
ipv6 lisp hardware-forwarding	109
ipv6 lisp itr	111
ipv6 lisp itr map-resolver	113
ipv6 lisp itr send-data-probe	115
ipv6 lisp itr-etr	117
ipv6 lisp locator-down	119
ipv6 lisp locator-vrf	121
ipv6 lisp map-cache	123
ipv6 lisp map-cache-limit	126
ipv6 lisp map-request-source	128
ipv6 lisp map-resolver	130
ipv6 lisp map-server	132
ipv6 lisp nat-transversal	134
ipv6 lisp proxy-etr	136
ipv6 lisp proxy-itr	138
ipv6 lisp shortest-eid-prefix-length	140
ipv6 lisp source-locator	142
ipv6 lisp translate	144
ipv6 lisp use-petr	146
ipv6 route	148

---

**CHAPTER 6****L Commands 151**

lig	152
lisp beta	155
lisp ddt	157
lisp ddt authoritative-prefix	158

lisp ddt map-server-peer 160  
lisp ddt root 161  
lisp dynamic-eid 163  
lisp extended-subnet-mode 165  
lisp instance id 167  
lisp loc-reach-algorithm 169  
lisp locator-set 172  
lisp map-request itr-rlocs 174  
lisp mobility 176  
lisp site 178

---

**CHAPTER 7****M Commands 181**

map-notify-group 182  
map-server 184

---

**CHAPTER 8****R Commands 187**

redistribute lisp route-map 188  
register-database-mapping 190  
roaming-eid-prefix 192

---

**CHAPTER 9****Show Commands 195**

show ip lisp 196  
show ip lisp database 200  
show ip lisp data-cache 201  
show ip lisp locator-hash 202  
show ip lisp map-cache 204  
show ip lisp statistics 206  
show ip lisp translation-cache 208  
show ip mroute detail 209  
show ip pim lisp encap 210  
show ipv6 lisp 211  
show ipv6 lisp database 215  
show ipv6 lisp data-cache 216  
show ipv6 lisp locator-hash 217  
show ipv6 lisp map-cache 219

show ipv6 lisp statistics	221
show ipv6 lisp translation-cache	223
show lisp ddt queue	224
show lisp ddt referral-cache	225
show lisp ddt vrf	226
show lisp dynamic-eid	227
show lisp proxy-itr	229
show lisp site	230







# Preface

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- [Preface, page ix](#)

## Preface

This preface describes the audience, organization, and conventions of the Book Title. It also provides information on how to obtain related documentation.

This chapter includes the following topics:

## Audience

This publication is for experienced network administrators who configure and maintain Cisco NX-OS on Cisco Nexus 7000 Series Platform switches.

## Document Conventions



### Note

- As part of our constant endeavor to remodel our documents to meet our customers' requirements, we have modified the manner in which we document configuration tasks. As a result of this, you may find a deviation in the style used to describe these tasks, with the newly included sections of the document following the new format.
- The Guidelines and Limitations section contains general guidelines and limitations that are applicable to all the features, and the feature-specific guidelines and limitations that are applicable only to the corresponding feature.

---

Command descriptions use the following conventions:

Convention	Description
<b>bold</b>	Bold text indicates the commands and keywords that you enter literally as shown.

Convention	Description
<i>Italic</i>	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x   y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x   y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y   z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
variable	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
screen font	Terminal sessions and information the switch displays are in screen font.
<b>boldface screen font</b>	Information you must enter is in boldface screen font.
<i>italic screen font</i>	Arguments for which you supply values are in italic screen font.
<>	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:



**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

**Caution**

---

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

---

## Related Documentation

Documentation for Cisco Nexus 7000 Series Switches is available at:

- Configuration Guides  
<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-installation-and-configuration-guides-list.html>
- Command Reference Guides  
<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-command-reference-list.html>
- Release Notes  
<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-release-notes-list.html>
- Install and Upgrade Guides  
<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-installation-guides-list.html>
- Licensing Guide  
<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-licensing-information-listing.html>

Documentation for Cisco Nexus 7000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders is available at the following URL:

<http://www.cisco.com/c/en/us/support/switches/nexus-2000-series-fabric-extenders/products-installation-and-configuration-guides-list.html>

## Documentation Feedback

### Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see [What's New in Cisco Product Documentation](#).

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the [What's New in Cisco Product Documentation RSS feed](#). RSS feeds are a free service.





## A Commands

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- [allowed-locator, page 2](#)
- [authentication-key, page 4](#)

# allowed-locator

To configure a list of locators that are allowed in a Map-Register message sent by an egress tunnel router (ETR) when registering to the Map Server, use the **allowed-locator** command. To remove the locators, use the **no** form of this command.

**allowed-locator rloc1 [rloc2 [rloc3 [rloc4]]]**

## Syntax Description

<b>rloc1</b>	IPv4 or IPv6 Routing Locator (RLOC) allowed within the Map-Registration message.
<b>rloc2,rloc3,rloc14</b>	Additional IPv4 or IPv6 RLOCs allowed within the Map-Registration message.

## Command Default

None

## Command Modes

LISP site configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When a LISP ETR registers with a Map Server, it sends a Map-Register message that contains, one or more EID-prefixes and routing locators that the ETR is configured to use. After verifying the authentication data, the Map Server checks the EID-prefixes against those configured on the Map-Server. If they agree, the Map Register is accepted and the ETR registration is completed.

You can constraint the Map Server default behavior so that the ETR can only register using specific routing locators. To enable this functionality, enter the allowed-locator command in LISP site configuration mode. The Map-Register message from the ETR must contain the same locators that are listed in the Map-Server LISP site configuration. If the list in the Map Register does not match the one configured on the Map Server, the Map-Register message is not accepted and the ETR is not registered. You can configure up to four IPv4 or IPv6 routing locators.



### Note

When you configure allowed locators, an exact match for all locators or a subset of all locators listed on the Map Server within the LISP site configuration must also appear in the Map-Register message sent by the ETR for it to be accepted.

This command does not require a license.



## Examples

This example shows how to configure the LISP site named Customer-1 and enter the site command mode. This example also shows the IPv4 address 172.16.1.1 and the IPv6 address 2001:db8:bb::1 are configured as allowable locators for the LISP site Customer-1. When Customer-1 registers with this Map Server, at least one or both of the configured locators must be included in the Map Registration for the site to register.

```
switch# configuration terminal
switch(config)# lisp site Customer-1
switch(config-lisp-site)# allowed-locator 172.16.1.1 2001:db8:bb::1
```

## Related Commands

Command	Description
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map Server.
show lisp site	Displays registered LISP sites on a Map Server.

# authentication-key

To configure the password used to create the SHA-1 HMAC hash for authenticating the Map-Register message sent by an egress tunnel router (ETR) when registering to the Map-Server, use the authentication-key command. To remove the password, use the no form of this command.

**authentication-key key-type password**

**no authentication-key key-type password**

## Syntax Description

key-type	Key type that the following SHA-1 password is encoded using. Type (0) indicates that a cleartext password follows. Type (3) indicates that a 3DES encrypted key follows, and Type (7) indicates that a Cisco Type 7 encrypted password follows.
password	Password used to create the SHA-1 HMAC hash when authenticating the Map-Register message sent by the ETR.

## Command Default

None

## Command Modes

LISP site configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When a Locator/ID Separation Protocol (LISP) ETR registers with a Map-Server, the Map Server must already have been configured with certain LISP site attributes that match the ETR attributes. These attributes include a shared password that is used to create the SHA-1 HMAC hash that the Map Server uses to validate the authentication data in the Map-Register message. On the ETR, this password is configured by using the `ip lisp etr map-server` and `ipv6 lisp etr map-server` command.

On the Map Server, the password is configured as part of the lisp site configuration process. To enter the LISP site password, enter the authentication-key command in LISP site configuration mode. You can enter the SHA-1 HMAC password in unencrypted (cleartext) form or encrypted form. To enter an unencrypted password, specify a key-type value of 0. To enter a 3DES-encrypted password, specify a key-type value of 3. To enter a Cisco-encrypted password, specify a key-type value of 7.

**Caution**

Map-Server authentication keys entered in cleartext form automatically are converted to Type 3 (encrypted) form.

**Note**

You must configure the Map Server and ETR with matching passwords for the Map-Registration process to successfully complete. When a LISP site successfully completes the Map-Registration process, its attributes are displayed by using the show lisp site command. If the Map-Registration process is unsuccessful, the site does not be display.

This command does not require a license.

**Examples**

This example shows how to configure the LISP site named Customer-1, enter the site command mode, and enter the shared password:

```
switch# configuration terminal
switch(config)# lisp site Customer-1
switch(config-lisp-site)# authentication-key 0 s0m3-s3cr3t-k3y
```

**Related Commands**

Command	Description
lisp site	Configures a LISP site and enters site configuration mode on a Map Server.
ip lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv4 EID prefixes.
ipv6 lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv6 EID prefixes.
show lisp site	Displays registered LISP sites on a Map Server.

authentication-key



## C Commands

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- [clear ip lisp data-cache](#), page 8
- [clear ip lisp map-cache](#), page 9
- [clear ip lisp statistics](#), page 11
- [clear ipv6 lisp data-cache](#), page 12
- [clear ipv6 lisp map-cache](#), page 13
- [clear ipv6 lisp statistics](#), page 15
- [clear lisp dynamic-eid](#), page 16
- [clear lisp proxy-itr](#), page 18
- [clear lisp site](#), page 20

# clear ip lisp data-cache

To clear the LISP IPv4 data-cache, use the **clear ip lisp data-cache** command.

**clear ip lisp data-cache** [**vrf vrf-name**] [**EID**]

## Syntax Description

vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) instance with which to clear the data cache.
EID	(Optional) IPv4 EID to clear from LISP data-cache.

## Command Default

None

## Command Modes

Any command mode  
network-adminvdc-admin

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The clear ip lisp data-cache command removes all IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping in the forwarding data-cache. Data-cache entries are present in two cases only: when the ip lisp itr send-data-probe command entered, after a data-probe is sent, this data-probe is stored in the data cache until a Map-Reply is returned, when you enter the ip lisp itr glean-mapping command, gleaned EID-to-RLOC mapping data is stored in the data cache until the data is verified. When you use the optional vrf keyword, the data-cache is cleared for the specified VRF. When the EID option is used, only the EID-to-RLOC mapping for that entry is cleared.

This command does not require a license.

## Examples

This example shows how to clear the LISP IPv4 data cache:

```
switch# clear ip lisp data-cache
```

## Related Commands

Command	Description
<b>show ip lisp data-cache</b>	Displays the LISP IPv4 EID-to-RLOC data-cache mapping on an Ingress Tunnel Router (ITR).

# clear ip lisp map-cache

To clear the Locator/ID Separation Protocol (LISP) IPv4 map-cache, use the **clear ip lisp map-cache** command.

**clear ip lisp map-cache** [vrf vrf-name] [EID]

## Syntax Description

vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) with which to clear the map cache.
EID	(Optional) IPv4 EID prefix to clear from LISP map cache.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The clear ipv lisp map-cache command removes all IPv4 dynamic endpoint identifier to Routing Locator (EID-to-RLOC) map-cache entries in the map cache. When the optional EID prefix is specified, only the EID-to-RLOC mapping for that entry is cleared. Otherwise, the entire data cache is cleared. When you specify the optional vrf keyword, the data cache is cleared for the specified VRF

This command does not require a license.

## Examples

This example shows how to clear the LISP IPv4 map-cache:

```
switch# clear ip lisp map-cache
switch# show ip lisp map-cache
LISP IP Mapping Cache for VRF "default", 0 entries
```

This example shows display all LISP map-cache entries, and then clears the LISP map-cache for an IPv4 EID prefix:

```
switch# show ip lisp map-cache
LISP IP Mapping Cache for VRF "default", 2 entries
153.16.1.0/24, uptime: 00:00:06, expires: 23:59:53, via map-reply, auth
  Locator      Uptime      State      Priority/  Data      Control
              Weight     in/out    in/out
129.250.1.255  00:00:06   up         254/0     0/0      0/0
129.250.26.242 00:00:06   up         1/100    0/0      0/0
153.16.12.0/24, uptime: 00:00:04, expires: 23:59:55, via map-reply, self
  Locator      Uptime      State      Priority/  Data      Control
```

## clear ip lisp map-cache

```

128.223.156.23 00:00:04 up          Weight   in/out   in/out
switch# clear ip lisp map-cache 153.16.1.0/24
switch# show ip lisp map-cache
LISP IP Mapping Cache for VRF "default", 1 entries
153.16.12.0/24, uptime: 00:00:46, expires: 23:59:13, via map-reply, self
Locator      Uptime      State      Priority/  Data      Control
              Weight      in/out    in/out
128.223.156.23 00:00:46  up        1/100     0/0      2/1
switch#

```

## Related Commands

Command	Description
show ip lisp map-cache	Displays current dynamic and static IPv4 EID-to-RLOC map-cache entries.



## clear ip lisp statistics

To clear the Locator/ID Separation Protocol (LISP) ingress tunnel router (ITR) and Egress Tunnel Router (ETR) IPv4 address-family packet count statistics, use the **clear ip lisp statistics** command.

**clear ip lisp statistics** [**vrf vrf-name**]

### Syntax Description

vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) with which to clear the LISP statistics.
--------------	--

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.
5.0(3.lisp)	This command was modified.

### Usage Guidelines

The clear ip lisp statistics command clears all of the LISP Ingress Tunnel Router (ITR) and ETR IPv4 address-family packet count statistics. IPv4 address family packet count statistics are maintained for all LISP control plane packets. These packet counters are displayed using the show ip lisp statistics command.

This command does not require a license.

### Examples

This example shows how to clear the LISP Ingress Tunnel Router (ITR) and ETR IPv4 address-family packet count statistics:

```
switch# clear ip lisp statistics
switch#
```

### Related Commands

Command	Description
show ip lisp statistics	Displays LISP IPv4 address-family statistics.

# clear ipv6 lisp data-cache

To clear the LISP IPv6 data-cache, use the **clear ipv6 lisp data-cache** command.

**clear ipv6 lisp data-cache** [**vrf vrf-name**] [**EID**]

## Syntax Description

vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) instance with which to clear the data cache.
EID	(Optional) IPv6 EID to clear from LISP map cache.

## Command Default

None

## Command Modes

Any command mode  
network-adminvdc-admin

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The clear ipv6 lisp data-cache command removes all IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping in the forwarding data-cache. Data-cache entries are present in two cases only: when the ip lisp itr send-data-probe command entered, after a data-probe is sent, this data-probe is stored in the data cache until a Map-Reply is returned, when you enter the ip lisp itr glean-mapping command, gleaned EID-to-RLOC mapping data is stored in the data cache until the data is verified. When you use the optional vrf keyword, the data-cache is cleared for the specified VRF. When the EID option is used, only the EID-to-RLOC mapping for that entry is cleared.

This command does not require a license.

## Examples

This example shows how to clear the LISP IPv6 data-cache:

```
switch# clear ipv6 lisp data-cache
```

## Related Commands

Command	Description
<b>show ipv6 lisp data-cache</b>	Displays the LISP IPv6 EID-to-RLOC data-cache mapping on an Ingress Tunnel Router (ITR).

# clear ipv6 lisp map-cache

To clear the Locator/ID Separation Protocol (LISP) IPv6 map-cache, use the **clear ipv6 lisp map-cache** command.

**clear ipv6 lisp map-cache** [*vrf vrf-name*] [*EID*]

## Syntax Description

vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) with which to clear the map cache.
EID	(Optional) IPv6 EID prefix to clear from LISP map cache.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The `clear ipv6 lisp map-cache` command removes all IPv6 dynamic endpoint identifier to Routing Locator (EID-to-RLOC) map-cache entries in the map cache. When the optional EID prefix is specified, only the EID-to-RLOC mapping for that entry is cleared. Otherwise, the entire data cache is cleared. When you specify the optional `vrf` keyword, the data cache is cleared for the specified VRF.

This command does not require a license.

## Examples

This example shows how to clear the LISP IPv6 map-cache:

```
switch# clear ipv6 lisp map-cache
switch# show ipv6 lisp map-cache
LISP IPv6 Mapping Cache for VRF "default", 0 entries
```

This example shows how to display all LISP map-cache entries, and then clears the LISP map-cache for an IPv4 EID prefix:

```
switch# show ipv6 lisp map-cache
LISP IP Mapping Cache for VRF "default", 2 entries
153.16.1.0/24, uptime: 00:00:06, expires: 23:59:53, via map-reply, auth
  Locator          Uptime      State      Priority/  Data      Control
                Weight      in/out     in/out
  129.250.1.255    00:00:06   up         254/0     0/0       0/0
  129.250.26.242  00:00:06   up         1/100    0/0       0/0
```

**clear ipv6 lisp map-cache**

```

153.16.12.0/24, uptime: 00:00:04, expires: 23:59:55, via map-reply, self
Locator      Uptime      State      Priority/  Data      Control
              Weight      in/out    in/out
128.223.156.23 00:00:04  up        1/100     0/0       0/0
switch# show ipv6 lisp map-cache
LISP IPv6 Mapping Cache for VRF "default", 1 entries
2610:d0:210f::/48, uptime: 00:00:58, expires: 23:59:01, via map-reply, auth
Locator      Uptime      State      Priority/  Data      Control
              Weight      in/out    in/out
85.184.2.10   00:00:58  up        0/100     0/0       0/0
2001:6e0:4:2::2 00:00:58  up        0/100     0/0       0/0

switch# clear ipv6 lisp map-cache 2610:d0:210f::/48
switch# show ipv6 lisp map-cache
LISP IPv6 Mapping Cache for VRF "default", 0 entries
switch#

```

**Related Commands**

Command	Description
<b>show ipv6 lisp map-cache</b>	Displays current dynamic and static IPv6 EID-to-RLOC map-cache entries.

# clear ipv6 lisp statistics

To clear the Locator/ID Separation Protocol (LISP) ingress tunnel router (ITR) and Egress Tunnel Router (ETR) IPv4 address-family packet count statistics, use the **clear ip lisp statistics** command.

**clear ipv6 lisp statistics** [vrf vrf-name]

## Syntax Description

vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) with which to clear the LISP statistics.
--------------	--

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.
5.0(3.lisp)	This command was modified.

## Usage Guidelines

The clear ipv6 lisp statistics command clears all of the LISP Ingress Tunnel Router (ITR) and ETR IPv4 address-family packet count statistics. IPv4 address family packet count statistics are maintained for all LISP control plane packets. These packet counters are displayed using the show ipv6 lisp statistics command.

This command does not require a license.

## Examples

This example shows how to clear the LISP Ingress Tunnel Router (ITR) and ETR IPv6 address-family packet count statistics:

```
switch# clear ipv6 lisp statistics
switch#
```

## Related Commands

Command	Description
show ipv6 lisp statistics	Displays LISP IPv6 address-family statistics.

# clear lisp dynamic-eid

To clear all dynamically learned dynamic endpoint identifiers (EIDs) that are associated with the configured dynamic-EID policy, use the clear lisp dynamic-eid command.

**clear lisp dynamic-eid dynamic-eid-name**

## Syntax Description

dynamic-eid-name	LISP dynamic-EID policy name.
------------------	-------------------------------

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The clear lisp dynamic-eid command clears all dynamically learned dynamic EIDs that are associated with the configured dynamic-EID policy.

This command does not require a license.

## Examples

This example shows how to display all dynamically learned dynamic-EIDs associated with the configured dynamic-EID policy:

```
switch# show lisp dynamic-eid bc4 detail
LISP Dynamic EID Information for VRF "default"
Dynamic-EID name: bc4
  Database-mapping EID-prefix: 30.1.110.104/32, LSBs: 0x00000001
  Locator: 90.1.93.1, priority: 1, weight: 10, local
  Registering more-specific dynamic-EIDs
  Map-Server(s): 90.32.32.32
  Number of roaming dynamic-EIDs discovered: 1
  Last dynamic-EID discovered: 30.1.110.104, 00:08:06 ago
  Roaming dynamic-EIDs:
    30.1.110.104, Ethernet2/5, uptime: 00:08:06, last activity: 0.998355
```

This example shows how to remove all dynamically learned dynamic EIDs that are associated with the configured dynamic-EID policy:

```
switch# clear lisp dynamic-eid bc4
switch#
```

**Related Commands**

<b>Command</b>	<b>Description</b>
show lisp site	Displays LISP site information. This command is applicable only for the Map-Server.
lisp dynamic-eid	Configures a LISP dynamic-EID policy.
lisp site	Configures a LISP site and enters site configuration mode on a Map-Server.
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to support LISP VM-mobility (dynamic-EID roaming).

## clear lisp proxy-itr

To clear the list of Proxy-ITR (PITR) locators that have been discovered through Map-Requests, use the **clear lisp proxy-itr** command.

**clear lisp proxy-itr** [**locator**] [**vrf vrf-name**]

### Syntax Description

locator	(Optional) IPv4 or IPv6 locator address of the PITR to clear.
vrf vrf-name	(Optional) Specifies virtual routing and forwarding (VRF) with which to clear locator address of the PITR.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(3.lisp-80)	This command was introduced.

### Usage Guidelines

When an xTR receives a Map-Request from a PITR for an endpoint identifier to Routing Locator (EID-to-RLOC) mapping resolution, the locator address of the PITR is saved (separately from the map cache) by an xTR there is a need to send Solicit-Map-Requests (SMRs) to other LISP devices, including PITRs. The number of locators currently cached is eight (8).

The `clear lisp proxy-itr` command removes all of the PITR locators that have been discovered through Map-Requests. When the locator form is used, only this PITR locator entry is removed. When you enter the `vrf` keyword, all PITR locators that are associated with this VRF are removed.

This command does not require a license.

### Examples

This example shows how to clear the list of PITR locators that have been discovered through Map-Requests:

```
switch# clear lisp proxy-itr
```



**Related Commands**

Command	Description
<b>show lisp proxy-itr</b>	Displays a list of PITRs discovered through Map-Requests.

# clear lisp site

To clear the registration data for the specified Locator/ID Separation Protocol (LISP) site, use the **clear lisp site** command.

**clear lisp site site-name**

## Syntax Description

site-name	LISP site.
-----------	------------

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The clear lisp site command clears the registration data for the specified LISP site. This command can only be used on a LISP Map-Server.

Use the show lisp site command to display the registration status of LISP sites.

This command does not require a license.

## Examples

This example shows how to clear the registration data for the specified LISP site:

```
switch# clear lisp site Customer-1
switch#
```

## Related Commands

Command	Description
show lisp site	Displays LISP site information. This command is applicable only for the Map-Server.



## D Commands

---

- [database-mapping, page 22](#)
- [description, page 24](#)

# database-mapping

To configure a IPv4 or IPv6 dynamic-endpoint identifier to Routing Locator (EID-to-RLOC) mapping relationship and its associated traffic policy, use the **database-mapping** command. To remove the configured database mapping, use the **no** form of this command.

**database-mapping dynamic-EID-prefix locator priority priority weight weight**

**no database-mapping dynamic-EID-prefix locator priority priority weight weight**

## Syntax Description

dynamic-EID-prefix	IPv4 or IPv6 dynamic-EID prefix and length to be registered as a roaming EID for this policy.
locator	IPv4 or IPv6 Routing Locator (RLOC) associated with this EID prefix.
priority priority	Priority (value between 0 and 255) assigned to the RLOC. Because only a single locator can be specified for dynamic-EIDs, you should set the priority to 1.
weight weight	The weight (value between 0 and 100) assigned to the locator. Since only a single locator can be specified for dynamic-EIDs, you should set the priority to 100.

## Command Default

None

## Command Modes

Dynamic-EID configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When you configure a dynamic-EID policy is configured, you must specify the dynamic-EID-to-RLOC mapping relationship and its associated traffic policy to use for each permitted prefix. When a packet is received on an interface on which the lisp mobility command has been applied, the source address of the packet is compared against the EID configured in the database-mapping entry (or entries) of the referenced lisp dynamic-eid dynamic-EID-policy-name that matches the lisp mobility dynamic-EID-policy-name.

When a dynamic-EID match is discovered, the dynamic-EID is registered to the Map Server with a 3-tuple of (locator, priority, weight). You can use multiple database-mapping entry commands to make up the locator-set for a dynamic-EID prefix. Both the dynamic-EID prefix and locator can be either an IPv4 or IPv6 address.

**Note**

All database-mapping dynamic-EID subcommands must be consistent on all LISP-VM switches that support the same roaming dynamic-EID.

This command does not require a license.

**Examples**

This example shows how to configure the LISP dynamic-EID policy named Roamer-1 and enter the dynamic-EID configuration mode and then configure the IPv4 dynamic-EID prefix with the IPv4 locator and a priority and weight:

```
switch# configuration terminal
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)# database-mapping 172.16.1.1/32 10.1.1.1 priority 1 weight 100
```

**Related Commands**

Command	Description
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map Server.
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM mobility (dynamic-EID roaming).

## description

To add a description to a Locator/ID Separation Protocol (LISP) site configuration, use the **description** command. To remove the reference to a LISP site, use the **no** form of this command.

**no lisp site description**

**no lisp site description**

### Syntax Description

description	Description listed with the associated LISP site.
-------------	---

### Command Default

None

### Command Modes

LISP site configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

On the Map Server, when you enter the lisp site command, you are placed in the site sub-command mode. In this mode, you can add a description with the referenced LISP site by using the description command. This description displays when you enter the show lisp site command.

This command does not require a license.

### Examples

This example shows how to configure the LISP site named Customer-1, enter the site command mode, and add the description string for Customer-1:

```
switch# configuration terminal
switch(config)# lisp site Customer-1
switch(config-lisp-site)# description Customer-1 Site Information
```

### Related Commands

Command	Description
lisp site	Configures a LISP site and enters site configuration mode on a Map Server.
show lisp site	Displays registered LISP sites on a Map Server.



## E Commands

---

- [eid-notify](#), page 26
- [eid-prefix](#), page 28

# eid-notify

To create the a dynamic Endpoint Identifier (EID) configuration on a first-hop router for LISP multihop mobility, use the **eid-notify** command. To remove the configuration, use the **no** form of this command.

**eid-prefix ip-address key authentication-key**

**no eid-prefix ip-address key authentication-key**

## Syntax Description

ip-address	IP address of the site gateway.
authentication-key	Shared key used to authenticate EID-Notify messages from first-hop routers.

## Command Default

The dynamic EID configuration is not created.

## Command Modes

Dynamic-EID configuration mode

## Command History

Release	Modification
6.2(8)	This command was introduced.

## Usage Guidelines

Use this command on a first-hop router to specify the IP address of device that functions both as an ingress tunnel router (ITR) and egress tunnel router (ETR), also known as an xTR.

Whenever a dynamic source is discovered, a map-register with an EID-Notify flag is sent to the specified gateway IP address and is periodically reregistered with that same site-gateway xTR. An authentication key is used to authenticate the Map-Notifies with EID-Notify flag messages received and to attach an authentication digest to the Map-Notify messages with EID-Notify flag to be sent to the site-gateway with the designated IP address.

This command does not require a license.

## Examples

This example shows how to configure a first-hop router for LISP multihop mobility:

```
switch# configure terminal
switch(config)# ip lisp etr
switch(config)# lisp dynamic-eid site 1
switch(config-lisp-dynamic-eid)# database-mapping 10.1.1.0/24 100.1.1.1 pr 10 w 50
switch(config-lisp-dynamic-eid)# eid-notify 12.36.0.3 key 3 75095fe9112836e3
switch(config-lisp-dynamic-eid)# map-notify-group 225.1.1.1
```



**Related Commands**

Command	Description
lisp dynamic-eid	Configures the LISP dynamic-EID roaming policy.

# eid-prefix

To configure a list of endpoint identifier (EID)-prefixes that are allowed in a Map-Register message sent by an egress tunnel router (ETR) when registering to the Map Server, use the **eid-prefix** command. To remove the locators, use the **no** form of this command.

**eid-prefix** [instance-id id] EID-prefix [route-tag tag] [accept-more-specifics]

**no eid-prefix** [instance-id id] EID-prefix [route-tag tag] [accept-more-specifics]

## Syntax Description

id	(Optional) EID Instance ID.
EID-prefix	IPv4 or IPv6 EID prefix associated with the LISP site.
route-tag tag	(Optional) Specifies the route tag associated with this EID prefix.
accept-more-specifics	(Optional) Specifies <b>to accept more specifics</b> .

## Command Default

None

## Command Modes

LISP site configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.
5.0(1.13) (August update)	Added the accept-more-specifics keyword.
5.0(3.lisp)	Added the instance-id keyword.

## Usage Guidelines

When a LISP ETR registers with a Map Server, it sends a Map-Register message that contains, one or more EID prefixes that the ETR is configured to be authoritative for. On the ETR, you can configure these EID prefixes by using the `ip lisp database-mapping` or `ipv6 lisp database-mapping` command. You must also configure these same EID prefixes on the Map Server in order for the ETR to properly register. On the Map Server, these EID prefixes are configured by using the `eid-prefix` command.

When you configure the registering xTR to enable a LISP instance ID by using the `lisp instance-id` command, you must also configure the Map Server to include this same instance ID within the EID prefix configurations for this LISP site by using the `instance-id` keyword and `id` value as part of the `eid-prefix` command.

The same EID prefix(es), and instance ID when applicable, must be configured on the Map Server and the ETR in order for the ETR to be registered, and for these EID prefixes to be advertised by LISP. After verifying the authentication data, the Map Server compares the EID prefixes within the Map Register message against those configured on the Map Server for the LISP site. If they agree, the Map Register is accepted and the ETR registration is completed. If the EID prefixes in the Map Register message do not match those configured on the Map Server, the Map-Register message is not accepted and the ETR is not registered.

**Note**

A Map-Register message sent by an ETR contains all of the EID prefixes that the ETR is authoritative for. All of these EID prefixes must be listed on the Map Server within the lisp site configuration for the Map-Register message sent by the ETR to be accepted. If the list in the Map-Register does not match the one configured on the Map Server, the Map-Register message is not accepted and the ETR is not registered.

When a LISP site successfully completes the Map-Registration process, you can display its attributes by using the show lisp site command. If the Map-Registration process is unsuccessful, the site does not display.

When you use the route-tag keyword, a tag value is associated with the EID prefix that is being configured. This tag value is useful for simplifying processes that populate the URIB or U6RIB alt-vrf. For example, you can define a route-map policy to match this tag for Border Gateway Protocol (BGP) redistribution of these EID prefixes into the virtual routing and forwarding (VRF) used by the LISP-ALT.

When you use the accept-more-specifics keyword, any EID prefix that is more specific than the EID prefix configured is accepted and tracked. The accept-more-specifics keyword is intended for LISP VM Mobility (dynamic-EID roaming). When a dynamic-EID moves from one LISP-VM switch to another, the registration of the dynamic-EID to a new locator is performed to the Map Server. Using this keyword avoids the need to configure an EID prefix for each dynamic-EID that is capable of roaming.

This command does not require a license.

**Examples**

This example shows how to configure the IPv4 EID prefix 192.168.1.0/24 and the IPv6 EID prefix 2001:db8:aa::/48, each with the route-tag 123, for the LISP site Customer-1:

```
switch# configure terminal
switch(config)# lisp site Customer-1
switch(config-lisp-site)# eid-prefix 192.168.1.0/24 route-tag 123
switch(config-lisp-site)# eid-prefix 2001:db8:aa::/48 route-tag 123
```

This example shows how to configure the IPv4 EID prefix 192.168.2.0/24 for the LISP site Roamer-1 and adds the accept-more-specific keyword. In this case, the host-prefix 192.68.2.12/32, could register according to this configuration:

```
switch# configure terminal
switch(config)# lisp site Roamer-1
switch(config-lisp-site)# eid-prefix 192.168.2.0/24 accept-more-specifics
```

This example shows how to configure the IPv4 EID prefix 192.168.1.0/24 with the instance ID of 123 for the LISP site Customer-2:

```
switch# configure terminal
switch(config)# lisp site Customer-2
switch(config-lisp-site)# eid-prefix instance-id 123 192.168.1.0/24 route-tag 123
```

**Related Commands**

Command	Description
ip lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv4 EID prefixes.
ipv6 lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv6 EID prefixes.
lisp site	Configures a LISP site and enters site configuration mode on a Map Server.
lisp dynamic-eid	Configures the LISP dynamic-EID roaming policy.
lisp mobility	Associates a LISP dynamic-EID roaming policy to an interface.



## I Commands

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- [instance-id](#), page 34
- [ip lisp alt-vrf](#), page 36
- [ip lisp database-mapping](#), page 38
- [ip lisp etr](#), page 41
- [ip lisp etr accept-map-request-mapping](#), page 43
- [ip lisp etr glean-mapping](#), page 45
- [ip lisp etr map-cache-ttl](#), page 47
- [ip lisp etr map-server](#), page 48
- [ip lisp hardware-forwarding](#), page 51
- [ip lisp itr](#), page 52
- [ip lisp itr map-resolver](#), page 54
- [ip lisp itr send-data-probe](#), page 56
- [ip lisp itr-etr](#), page 58
- [ip lisp locator-down](#), page 60
- [ip lisp locator-vrf](#), page 62
- [ip lisp map-cache](#), page 64
- [ip lisp map-cache-limit](#), page 67
- [ip lisp map-request-source](#), page 70
- [ip lisp map-resolver](#), page 72
- [ip lisp map-server](#), page 74
- [ip lisp multicast](#), page 76
- [ip lisp nat-transversal](#), page 77
- [ip lisp proxy-etr](#), page 79
- [ip lisp proxy-itr](#), page 81

- [ip lisp shortest-eid-prefix-length](#), page 83
- [ip lisp source-locator](#), page 85
- [ip lisp translate](#), page 87
- [ip lisp use-petr](#), page 89
- [ip pim rp-address](#), page 91
- [ip pim ssm](#), page 92
- [ip route](#), page 93
- [ipv6 lisp alt-vrf](#), page 94
- [ipv6 lisp database-mapping](#), page 96
- [ipv6 lisp etr](#), page 99
- [ipv6 lisp etr accept-map-request-mapping](#), page 101
- [ipv6 lisp etr glean-mapping](#), page 103
- [ipv6 lisp etr map-cache-ttl](#), page 105
- [ipv6 lisp etr map-server](#), page 106
- [ipv6 lisp hardware-forwarding](#), page 109
- [ipv6 lisp itr](#), page 111
- [ipv6 lisp itr map-resolver](#), page 113
- [ipv6 lisp itr send-data-probe](#), page 115
- [ipv6 lisp itr-etr](#), page 117
- [ipv6 lisp locator-down](#), page 119
- [ipv6 lisp locator-vrf](#), page 121
- [ipv6 lisp map-cache](#), page 123
- [ipv6 lisp map-cache-limit](#), page 126
- [ipv6 lisp map-request-source](#), page 128
- [ipv6 lisp map-resolver](#), page 130
- [ipv6 lisp map-server](#), page 132
- [ipv6 lisp nat-transversal](#), page 134
- [ipv6 lisp proxy-etr](#), page 136
- [ipv6 lisp proxy-itr](#), page 138
- [ipv6 lisp shortest-eid-prefix-length](#), page 140
- [ipv6 lisp source-locator](#), page 142
- [ipv6 lisp translate](#), page 144
- [ipv6 lisp use-petr](#), page 146

- [ipv6 route, page 148](#)

# instance-id

To configure an instance ID to be associated with EID prefixes configured for this dynamic-EID policy, use the **instance-id** command. To disable this functionality, use the no form of this command.

**instance-id id**

**no instance-id id**

## Syntax Description

<b>id</b>	Instance ID for this xTR. The range is from 1 to 16777215.
-----------	--

## Command Default

None

## Command Modes

Dynamic-EID configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

Virtualization support is currently available in LISP xTRs and Map Server (MS) or Map Resolver (MRs), including for LISP VM mobility. The instance ID has been added to LISP to support virtualization.

Use this command to configure the instance ID associated with EID prefixes configured for this dynamic-EID policy. Entering this command allows ETRs to register multiple overlapping EID prefixes in a segmented manner by using the instance ID as the distinguisher. Only one instance-id may be configured for each dynamic-EID policy. When an instance-id is configured, this instance ID is included with the EID prefixes when they are registered with the Map Server. The Map Server must also include the same instance-id within the EID prefix configurations for this LISP site. Instance IDs are configured on the MS using the eid-prefix command within the lisp site command mode.



### Note

Virtualization support is not currently available for the LISP ALT, which means that it is also not supported on LISP PITRs.

This command does not require a license.

## Examples

This example shows how to configure an instance ID for the dynamic-EID policy Roamer-1:

```
switch# configure terminal
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)# instance-id 123
```



**Related Commands**

Command	Description
<b>eid-prefix</b>	Enters the LISP Map-Server site configuration mode subcommand for configuring the EID prefix and associated instance ID for a LISP site.

## ip lisp alt-vrf

To configure the virtual routing and forwarding (VRF) instance that the Cisco NX-OS device uses when sending map requests for an IPv4 end point identifier (EID) to Routing Locator mapping directly over the Locator/ID Separation Protocol Alternative Topology (LISP-ALT), use the **ip lisp alt-vrf** command. To remove the reference to a VRF, use the **no** form of this command.

**ip lisp alt-vrf vrf-name**

**no ip lisp alt-vrf vrf-name**

### Syntax Description

vrf-name	Name assigned to the LISP ALT VRF.
----------	------------------------------------

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ip lisp alt-vrf** command to configure which virtual routing and forwarding (VRF) instance that the LISP device should use for control plane mapping resolution functions.

You must use the **ip lisp alt-vrf** command for all devices that connect to the ALT to exchange LISP control plane messages for mapping. These devices include LISP Map-Server (MS), Map-Resolver (MR), and Proxy Ingress Tunnel Router (PITR) devices, and directly ALT-connected xTRs.

Follow these guidelines when using this command:

- The LISP ALT does not support virtualization. A Map-Request with an instance-id cannot be forwarded over the LISP ALT. When you configure a LISP device for virtualization, you must not use the **ip lisp alt-vrf** command.
- When you configure instance IDs on an MS (see the **LISP Site eid-prefix** command), you must configure the MS as a standalone because virtualization of the LISP ALT is not supported.
- When you configure a Cisco NX-OS device as a standalone MS or MR without virtualization, you need not use the **ip lisp alt-vrf** command.
- When you configure a Cisco NX-OS device as a LISP PITR, you can use the **ip lisp alt-vrf** command if you are using the ALT for EID-to-RLOC mapping resolution. You can configure PITRs to send a Map-Request to a configured Map-Resolver for EID-to-RLOC mapping resolution as an alternative to sending a Map-Request directly over the LISP ALT. When using a PITR in a virtualized LISP deployment,

you must configure the PITR to use a Map-Resolver for EID-to-RLOC mapping resolution, not the LISP ALT because the LISP ALT does not support virtualization.

**Note**

When you use the `ip lisp alt-vrf` command, the referenced VRF must already have been created by using the `vrf context` command. In addition, the corresponding configurations for connecting the LISP device to the ALT, including the generic routing encapsulation (GRE) tunnel interface(s) and any routing that is associated with the VRF (static or dynamic) you must also have created.

**Examples**

This example shows how to configure the VRF named `lisp` and then configure LISP to use this VRF when resolving IPv4 EID-to-RLOC mappings:

```
switch# configure terminal
switch(config)# vrf context lisp
switch(config-vrf)# exit
switch(config-vrf)# ip lisp alt-vrf lisp
```

**Related Commands**

Command	Description
<code>ip lisp itr map-resolver</code>	Configures the IPv4 or IPv6 locator address of the LISP Map-Resolver to which the Ingress Tunnel Router (ITR) sends IPv4 Map-Request messages.
<code>ip lisp it</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
<code>ip lisp proxy-itr</code>	Configures the NX-OS device to act as an IPv4 LISP Proxy Ingress Tunnel Router (PITR).

## ip lisp database-mapping

To configure an IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping relationship and its associated traffic policy, use the **ip lisp database-mapping** command. To remove the configured database mapping, use the **no** form of this command.

**ip lisp database-mapping EID-prefix {locator| dynamic} priority priority weight weight**

**no ip lisp database-mapping EID-prefix {locator| dynamic} priority priority weight weight**

### Syntax Description

EID-prefix	IPv4 EID prefix and length.
locator	IPv4 or IPv6 RLOC associated with this EID prefix.
dynamic	Allows the RLOC associated with this EID to be determined dynamically.
priority priority	Specifies the priority (value between 0 and 255) assigned to the RLOC. When multiple locators have the same priority, they can be used in load-shared fashion. A lower value indicates a higher priority.
weight weight	Specifies the weight (value between 0 and 100) assigned to the locator. Use this keyword to determine how to load-share traffic between multiple locators when the priorities assigned to multiple locators are the same. The weight argument represents the percentage of traffic to be load-shared.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ip lisp database-mapping** command to configure the LISP database parameters for the specified IPv4 EID prefix block, including its associated locator, priority, and weight. The IPv4 EID prefix is the LISP IPv4 EID prefix block that is associated with the site that the Cisco NX-OS Series device registers as being authoritative with a Map Server. The locator is typically the IPv4 or IPv6 address of a loopback interface but

can be the IPv4 or IPv6 address of any interface used as the Routing Locator (RLOC) address for the EID prefix assigned to the site. A priority and weight are used to define traffic policies when multiple RLOCs apply to the same EID prefix block.

When you configure a Cisco NX-OS Series device as an egress tunnel router (ETR), these LISP database-mapping parameters are advertised within a Map-Reply message to indicate the ingress traffic preferences of the site for the associated EID prefix block. An ingress tunnel router (ITR) then selects a source locator (outer header) address for encapsulating packets destined to the EID prefix based on these advertised parameters.

When a LISP site has multiple locators associated with the same EID prefix block, you use multiple `ip lisp database mapping` commands to configure all of the locators for a given EID prefix block. Each locator can be assigned with the same or a different priority value between 0 and 255. When multiple locators are assigned different priority values, the priority value is used to determine which locator to prefer. A lower value indicates a more preferable path. A value of 255 indicates that the locator must not be used for unicast traffic forwarding.

When multiple locators have the same priority, they can be used in a load-sharing manner. In this case, for a given priority, the weight given to each locator is used to determine how to load-balance unicast packets between them. The weight is a value between 0 and 100 and represents the percentage of traffic to be load shared to that locator. If you assign a nonzero weight value to any locator for a given EID prefix block, you must assign all locators with the same priority for that same EID prefix block with a nonzero weight value. The sum of all weight values must equal 100. If you assign a weight value of zero to any locator for a given EID prefix block, you must assign all locators with the same priority for that same EID prefix block with a weight value of zero. A weight value of zero indicates to an Ingress Tunnel Router (ITR) that receives the Map-Reply that it can decide how to load-share traffic destined to that EID prefix block.

When you assign a LISP site with multiple IPv4 EID prefixes, the `ip lisp database-mapping` is configured for each IPv4 EID prefix assigned to the site and for each locator that has a reachable IPv4 EID prefix.

When multiple ETRs are used at a LISP site, you must enter the `ip lisp database-mapping` command on all ETRs for all locators to make an IPv4 EID prefix block reachable even when the locator is not local to the specific ETR that is being configured.

If the ETR receives its RLOC through a dynamic process such as DHCP, or if it is sited behind a Network Address Translation (NAT) device and the routing locator belongs to the private address space that the NAT device translates to a public globally routed address, you might not be able to specify a locator in the `ip lisp database-mapping` entry. Add the `dynamic` keyword with the `ip lisp database-mapping` command so that the RLOC for this Cisco NX-OS device will be determined dynamically rather than being statically defined in each `ip lisp database-mapping` entry.

When an ETR is sited behind NAT, it needs to know the public global locator address; this is address that is required for Map-Register and Map-Reply messages. You should enter the `{ip | ipv6} lisp nat-traversal` command. For more information, see the `{ip | ipv6} lisp nat-traversal` command.

This command does not require a license.

## Examples

This example shows how to configure LISP database-mapping entries for a single IPv4 EID prefix block and two locators associated with the EID prefix block. Each locator is assigned with the same priority (1) and weight (50), indicating that ingress traffic is expected to be load-shared equally across both paths.

```
switch# configure terminal
switch(config)# ip lisp database-mapping 192.168.1.0/24 10.1.2.1 priority 1 weight 50
switch(config)# ip lisp database-mapping 192.168.1.0/24 10.1.1.1 priority 1 weight 50
```

**Related Commands**

Command	Description
<b>ip lisp etr map-server</b>	Configures the IPv4 or IPv6 locator address of the LISP Map Server that ETR uses to register its IPv4 EID prefixes.
ip lisp locator-down	Configures an IPv4 or IPv6 locator from a locator set associated with the IPv4 EID prefix database mapping to be down.
ip lisp map-cache	Configures a static IPv4 EID prefix to the locator map-cache entry.
ip lisp nat-transversal	Configures an ETR with a private locator that is sited behind a NAT device to dynamically determine its NAT-translated public globally routed locator address for the applied interface.

# ip lisp etr

To configure a Cisco NX-OS device to act as an IPv4 Locator/ID Separation Protocol (LISP) Egress Tunnel Router (ETR), use the **ip lisp etr** command. To remove LISP ETR functionality, use the **no** form of this command.

**ip lisp etr**

**no ip lisp etr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** When you configure a Cisco NX-OS device as an IPv4 ETR, also use the ip lisp database-mapping command so that the Egress Tunnel Router (ETR) knows what endpoint identifier (EID) prefix blocks and corresponding locators are used for the LISP site. You should configure the ETR to register with a Map Server by using the ip lisp etr map-server command or to use static LISP EID-to-RLOC mappings by using the ip lisp map-cache command in order to participate in LISP networking.

When a map-cache entry contains mixed locators (both IPv4 and IPv6 RLOCs) and an ingress tunnel router (ITR) encapsulates using an IPv4 locator, you must configure the ETR that is assigned with the IPv4 locator by using the ip lisp etr command. When an IPv6 locator is used by an Ingress Tunnel Router (ITR), you must configure the ETR that is assigned with the IPv6 locator by using the ipv6 lisp etr command.



**Note** You can configure an ETR as an Ingress Tunnel Router (ITR). However, the LISP architecture does not require that you do so. When configuring a device as both an Ingress Tunnel Router (ITR) and an ETR, use the ip lisp itr-etr command to enable both capabilities.

This command does not require a license.

**Examples** This example shows how to configure the IPv4 LISP ETR functionality on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# ip lisp etr
```

**Related Commands**

Command	Description
ip lisp database-mapping	Specifies to configure an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.
ip lisp itr-etr	Configures the router to act as an IPv4 LISP Ingress Tunnel Router (ITR) and an IPv4 LISP Egress Tunnel Router (ETR) with one command.
ip lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map-Server to which an ETR should register for its IPv4 EID prefixes.
ip lisp itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
ip lisp map-cache	Configures a static IPv4 EID Prefix to the locator map-cache entry.



## ip lisp etr accept-map-request-mapping

To configure an Egress Tunnel Router (ETR) to cache IPv4 mapping data contained in a Map-Request message, use the **ip lisp etr accept-map-request-mapping** command. To remove this functionality, use the **no** form of this command.

**ip lisp etr accept-map-request-mapping** [verify]

**no ip lisp etr accept-map-request-mapping** [verify]

### Syntax Description

<b>verify</b>	(Optional) Specifies that mapping data should be cached but not used for forwarding packets until the ETR can send its own Map Request to one of the locators from the mapping data record and receive a Map Reply with the same data in response.
---------------	--

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When an ETR receives a Map-Request message, this message might contain mapping data for the invoking IPv4 source-EID packet. By default, the ETR ignores mapping data included in Map-Request messages. However, by entering the **ip lisp etr accept-map-request-mapping** command, the ETR caches the mapping data in its map cache and immediately uses it to forward packets.

When you use the optional **verify** keyword, the ETR still caches the mapping data but does not forward packets until the ETR can send its own Map Request to one of the locators from the mapping data record and receive the same data in a Map-Reply message.



#### Note

For security purposes, we recommend that you use the **verify** keyword. Unless you deploy the ETR and Ingress Tunnel Router (ITR) in a trusted environment, you should use the optional **verify** keyword. In a trusted environment, if you do not use the optional **verify** keyword, the new mapping occurs in one-half round-trip-time (RTT) as compared with the normal Map-Request/Map-Reply exchange process.

When you enable and then later disable this command, you must enter the **clear ip lisp map-cache** command to clear any map-cache entries that are currently in the tentative state. Map-cache entries can remain in the

tentative state for up to one minute; therefore, you might want to clear these entries manually when this command is removed.

This command does not require a license.

### Examples

This example shows how to configure the ETR to cache IPv4 mapping data included in Map-Request messages and verify its accuracy prior to using this data to forward packets:

```
switch# configure terminal
switch(config)# ip lisp etr accept-map-request-mapping verify
```

### Related Commands

Command	Description
ip lisp etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).
clear ip lisp map-cache	Clears the LISP IPv4 map cache on the local Cisco NX-OS device.

## ip lisp etr glean-mapping

To configure an egress tunnel router (ETR) to add inner header (EID) source address to outer header (RLOC) source address mappings it to its endpoint identifier to Routing Locator (EID-to-RLOC) cache (map-cache), use the **ip lisp etr glean-mapping** command. To remove this functionality, use the **no** form of this command.

**ip lisp etr glean-mapping** [verify]

**no ip lisp etr glean-mapping** [verify]

### Syntax Description

<b>verify</b>	(Optional) Specifies that gleaned EID-to-RLOC mapping data should be cached but not used for forwarding packets until the ETR can send its own Map Request to the originating Ingress Tunnel Router (ITR) and receive a Map Reply with the same data.
---------------	---

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When an ETR receives Locator/ID Separation Protocol (LISP)-encapsulated packets, the inner header EID source address and outer header RLOC source address should match an entry found in the map cache as determined by the results of a Map-Request/Map-Reply exchange. When a host moves from one ingress tunnel router (ITR) to another ITR, the EID-to-RLOC mapping changes because the new Ingress Tunnel Router (ITR) can encapsulate packets to the ETR using a different locator. By entering the **ip lisp etr glean-mapping** command, the ETR recognizes the new locator information for the moved host's EID and updates the map cache with this information.

The learned EID-to-RLOC map-cache entries are stored with a priority of 1 and a weight of 100.

When you enter the optional **verify** keyword, the ETR caches the learned EID-to-RLOC mapping data but does not forward packets until the ETR can send its own Map Request to the originating Ingress Tunnel Router (ITR) and receive a Map Reply. The gleaned locator will then be used. When you specify the **verify** keyword, the locator is used to forward traffic and all packets are dropped until the Map Reply is returned.

**Note**

For security purposes, we recommend that you use the verify keyword. Unless you deploy the ETR and Ingress Tunnel Router (ITR) in a trusted environment, you should use the optional verify keyword. In a trusted environment, if you do not use the optional verify keyword, the new mapping occurs in one-half round-trip-time (RTT) as compared with the normal Map-Request/Map-Reply exchange process.

This command does not require a license.

**Examples**

This example shows how to configure the ETR to cache IPv4 mapping data included in Map-Request messages and verify its accuracy prior to using this data to forward packets:

```
switch# configure terminal
switch(config)# ip lisp etr glean-mapping verify
```

**Related Commands**

Command	Description
ip lisp etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).

## ip lisp etr map-cache-ttl

To configure the Time-to-live (TTL) value inserted into Locator/ID Separation Protocol (LISP) IPv4 Map-Reply messages, use the **ip lisp etr map-cache-ttl** command. To remove the configured TTL value and return to the default value, use the **no** form of this command.

**ip lisp etr map-cache-ttl time-to-live**

**no ip lisp etr map-cache-ttl time-to-live**

### Syntax Description

time-to-live	Value, in minutes, to be inserted in the TTL field in Map-Reply messages. The range is from 60 to 10080.
--------------	--

### Command Default

1440

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ip lisp etr map-cache-ttl** command to change the default value associated with the TTL field in IPv4 Map-Reply messages. Use this command when you want to change the default TTL that remote Ingress Tunnel Routers (ITRs) cache and use for your site's IPv4 EID prefix. The default value is 1440 minutes (24 hours). The minimum value cannot be less than 60 minutes, and the maximum cannot be greater than 10080 minutes (one week).

This command does not require a license.

### Examples

This example shows how to configure the ETR to use a TTL of 120 minutes in its IPv4 Map-Reply messages:

```
switch# configure terminal
switch(config)# ip lisp etr map-cache-ttl 120
```

### Related Commands

Command	Description
<b>ip list etr</b>	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).

## ip lisp etr map-server

To configure the IPv4 or IPv6 locator address of the Locator/ID Separation Protocol (LISP) Map Server to be used by the egress tunnel router (ETR) when registering for IPv4 EIDs, use the **ip lisp etr map-server** command. To remove the configured locator address of the LISP Map Server, use the **no** form of this command.

**ip lisp etr map-server map-server-address** {[key key-type authentication-key] proxy-reply}

**no ip lisp etr map-server map-server-address** {[key key-type authentication-key] proxy-reply}

### Syntax Description

map-server-address	IPv4 or IPv6 address of the Map Server.
key	(Optional) Specifies the key type that indicates how the following SHA-1 password (key) is encoded.
key-type	Key type. Type (0) indicates that a clear text password follows, Type (3) indicates that a 3DES encrypted key follows, and Type (7) indicates that a Cisco Type 7 encrypted password follows.
authentication-key	Password used for computing the SHA-1 HMAC hash that is included in the header of the Map-Register message.
proxy-reply	Specifies that the ETR should indicate to the Map Server through a Map Register message that the Map Server should send Map Replies on behalf of the site.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ip lisp etr map-server** command to configure the IPv4 or IPv6 locator of the Map Server to which the ETR registers for its IPv4 EID(s). A password used for a SHA-1 HMAC hash that is included in the header of the Map-Register message must also be provided. You can configure the ETR to register with a maximum of two Map Servers per EID address family. Once the ETR registers with the Map-Server(s), the Map Server(s) begin to advertise the EID prefix block(s) and RLOC(s) for the LISP site.

You can enter the SHA-1 HMAC password in unencrypted (cleartext) form or encrypted form. To enter an unencrypted password, specify a key-type value of 0. To enter a 3DES-encrypted password, specify a key-type value of 3. To enter a Cisco-encrypted password, specify a key-type value of 7.

**Caution**

A Map-Server authentication key entered in cleartext form will automatically be converted to Type 3 (encrypted) form.

**Note**

You must also configure the Map Server with IPv4 EID prefixes that match the IPv4 EID prefixes configured on this ETR by using the `ip lisp database-mapping` command, as well as a password that matches the one provided with the `key` keyword on this ETR.

- When you enter the `ip lisp database-mapping` command, the ETR does not need to run the Locator/ID Separation Protocol Alternative Topology (LISP-ALT) for EID-to-RLOC mapping resolution. You can remove all commands related to the Alternative Topology-Virtual Routing and Forwarding (VRF) (ALT-VRF).

When you use the `proxy-reply` keyword, the ETR indicates to the Map Server through a Map-Register message that the Map Server should send Map Replies on behalf of the site. The Map Server sends nonauthoritative Map Replies for all the EID prefixes in the Map-Register message. On the Map Server, the `show lisp site site-name` command indicates whether proxy-reply is enabled or not.

This command does not require a license.

**Examples**

This example shows how to configure the ETR to register to two Map Servers, one with the locator 10.1.1.1 and another with the locator 172.16.1.7:

```
switch# configure terminal
switch(config)# ip lisp etr map-server 10.1.1.1 key 3 1c27564ab12121212
switch(config)# ip lisp etr map-server 172.16.1.7 key 3 1c27564ab12121212
```

This example shows how to configure the ETR to register to the Map Server with the locator 10.1.1.1 and to request a Map Server proxy reply for the site:

```
switch# configure terminal
switch(config)# ip lisp etr map-server 10.1.1.1 key 3 1c27564ab12121212
switch(config)# ip lisp etr map-server 10.1.1.1 proxy-reply
```

**Related Commands**

Command	Description
<code>ip lisp alt-vrf</code>	Configures which VRF that LISP should use when sending map requests for an IPv4 EID-to-RLOC mapping directly over the ALT.
<code>ip lisp database-mapping</code>	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.
<code>ip lisp etr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).

Command	Description
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).
lisp site	Configure a LISP site and enters site configuration mode on a Map Server.



# ip lisp hardware-forwarding

To enable hardware-forwarding specifically on the Cisco Nexus 7000 Series device when at least one 32x10GE line card is installed, use the **ip lisp hardware-forwarding** command. To disable hardware-forwarding functionality, use the no form of this command.

**ip lisp hardware-forwarding**

**no ip lisp hardware-forwarding**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Enabled

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** The ip lisp hardware-forwarding command is applicable to the Cisco Nexus 7000 Series switch only. Hardware forwarding for LISP is supported on the N7K-M132XP-12 line card only. That is, LISP input and output interfaces must be on the N7K-M132XP-12 line card.



**Caution**

Disabling hardware forwarding should only be used in diagnostic situations. Entering the no ip lisp hardware-forwarding command causes a full map-cache download to the Cisco NX-OS device hardware.

This command does not require a license.

**Examples**

This example shows how to disable IPv4 LISP hardware forwarding on the Cisco Nexus 7000 Series device:

```
switch# configure terminal
switch(config)# no ip lisp hardware-forwarding
switch(config)# exit
```

# ip lisp itr

To configure a Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR), use the **ip lisp itr** command. To remove LISP Ingress Tunnel Router (ITR) functionality, use the **no** form of this command.

**ip lisp itr**

**no ip lisp itr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** When a Cisco NX-OS device is configured as an Ingress Tunnel Router (ITR), if a packet is received for which no IPv4 destination address prefix match exists in the routing table or which matches a default route (you can configure that the source address of the packet matches an IPv4 EID prefix block configured by using the **ip lisp database-mapping** command or **ip lisp map-cache** command. The packet is a candidate for LISP routing. The Ingress Tunnel Router (ITR) looks in the LISP map cache and forwards either the packet, drops the packet, sends a Map Request, or LISP-encapsulates the packet.

If there is no match in the LISP map cache, the Ingress Tunnel Router (ITR) might use one of two methods to obtain an IPv4 EID-to-RLOC mapping. When a Map Resolver is configured when you enter the **ip lisp itr map-resolver** command, the Ingress Tunnel Router (ITR) sends its Map Request in a LISP Encapsulated Control Message (ECM) to the Map Resolver. When the Ingress Tunnel Router (ITR) is attached to the ALT using the **ip lisp alt-vrf** command, the Ingress Tunnel Router (ITR) sends its Map Request directly on the alternate LISP topology (LISP-ALT). The Ingress Tunnel Router (ITR) caches the IPv4 EID-to-RLOC mapping information returned by the associated Map Reply in its map cache. Subsequent packets destined to the same IPv4 EID prefix block are then LISP-encapsulated according to this IPv4 EID-to-RLOC mapping entry.



**Note** An Ingress Tunnel Router (ITR) can also be configured as an ETR. However, the LISP architecture does not require this requirement.

This command does not require a license.

**Examples**

This example shows how to configure the IPv4 LISP Ingress Tunnel Router (ITR) on the Cisco NX-OS device:

```
switch# configure terminal  
switch(config)# ip lisp itr
```

**Related Commands**

Command	Description
ip lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.
ip lisp database-mapping	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.
ip lisp itr map-resolver	Configures the IPv4 or IPv6 locator address of the LISP Map Resolver to which the Ingress Tunnel Router (ITR) sends IPv4 Map-Request messages.
ip lisp map-cache	Configures a static IPv4 EID prefix to locator map-cache entry.

## ip lisp itr map-resolver

To configure the IPv4 or IPv6 locator address of the Locator/ID Separation Protocol (LISP) Map Resolver to be used by the ingress tunnel router (ITR) or Proxy ITR (PITR) when sending Map Requests for IPv4 EID-to-RLOC mapping resolution, use the **ip lisp itr map-resolver** command. To remove the configured locator address of the LISP Map Resolver, use the **no** form of this command.

**ip lisp itr map-resolver map-resolver-address**

**no ip lisp itr map-resolver map-resolver-address**

### Syntax Description

map-resolver-address	IPv4 or IPv6 locator addresses of the Map Resolver.
----------------------	---

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Up to two Map Resolvers can be configured per Ingress Tunnel Router (ITR) or PITR within a site for each address family.

When a LISP Ingress Tunnel Router (ITR) or PITR needs to resolve an IPv4 EID-to-RLOC mapping for a destination EID, you can configure it to send a map request either to a Map Resolver by using the `ip lisp itr map-resolver` command or directly over the LISP ALT by using the `ip lisp alt-vrf` command. When a Map Resolver is used, map requests are sent to the Map Resolver with the additional LISP Encapsulated Control Message (ECM) header that includes the Map Resolver RLOC as its destination address. When the ALT is used, map requests are sent directly over the ALT without the additional LISP Encapsulated Control Message (ECM) header, where the destination of the map request is the EID being queried.



#### Note

When you use the `ip lisp itr map-resolver` command, the Ingress Tunnel Router (ITR) or PITR does not run the LISP-ALT. All commands related to the ALT-VRF are ignored (and may be removed).

This command does not require a license.

**Examples**

This example shows how to configure an Ingress Tunnel Router (ITR) to use the Map Resolver when sending its Map-Request messages:

```
switch# configure terminal
switch(config)# ip lisp itr map-resolver 10.1.1.1
switch(config)# ip lisp itr map-resolver 2001:db8:0a::1
```

**Related Commands**

Command	Description
ip lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.
ip lisp itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
ip lisp map-request-source	Configures the source IPv4 or IPv6 address to be used in IPv4 LISP Map-Request messages.

## ip lisp itr send-data-probe

To configure an ingress tunnel router (ITR) or Proxy ITR (PITR) to find an IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping for a packet it needs to encapsulate by sending a Data Probe rather than by sending a Map-Request message, use the **ip lisp itr send-data-probe** command. To remove this functionality, use the **no** form of this command.

**ip lisp itr send-data-probe**

**no ip lisp itr send-data-probe**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** When a Locator/ID Separation Protocol (LISP) Ingress Tunnel Router (ITR) or PITR gets a map-cache miss and needs to resolve an IPv4 EID-to-RLOC mapping for a destination EID, you can send a Map-Request message either in a LISP Encapsulate Control Message (ECM) to the Map Resolver by using the `ip lisp itr map-resolver` command or directly over the Locator/ID Separation Protocol Alternative Topology (LISP-ALT) by using the `ip lisp alt-vrf` command. In either case, the first packet of the flow that caused the map-cache miss is dropped. Once the Map Reply populates the map cache, subsequent packets to the same destination are forwarded directly by LISP.



**Note**

When you configure an Ingress Tunnel Router (ITR) or PITR by using the `ip lisp itr send-data-probe` command, you must also configure the Ingress Tunnel Router (ITR) or PITR to use the LISP-ALT by using the `ip lisp alt-vrf` command because the data probe is sent over the LISP-ALT.



**Caution**

We do not recommend that you use the LISP data probe because this mechanism forwards data plane traffic over the LISP-ALT. The LISP-ALT is intended to function solely as a control plane mechanism for LISP and its use subjects it to denial of service attacks.

This command does not require a license.

**Examples**

This example shows how to configure a LISP Ingress Tunnel Router (ITR) to send data probes to determine IPv4 EID-to-RLOC mappings:

```
switch# configure terminal
switch(config)# ip lisp itr send-data-probe
```

**Related Commands**

Command	Description
ip lisp alt-vrf	Configures which VRF supporting the IPv4 address-family that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.
ip lisp itr map-resolver	Configures the IPv4 or IPv6 locator address of the LISP Map Resolver to which the Ingress Tunnel Router (ITR) sends IPv4 Map Request messages.

## ip lisp itr-etr

To configure a Cisco NX-OS device to act as both an IPv4 LISP Ingress Tunnel Router (ITR) and Egress Tunnel Router (ETR), use the **ip lisp itr-etr** command. To remove the LISP Ingress Tunnel Router (ITR) functionality, use the **no** form of this command.

**ip lisp itr-etr**

**no ip lisp itr-etr**

**Syntax Description** This command has no arguments or keywords

**Command Default** None

**Command Modes** Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the `ip lisp itr-etr` command to enable the Cisco NX-OS device to perform both IPv4 LISP Ingress Tunnel Router (ITR) and Egress Tunnel Router (ETR) functionality simultaneously, by using a single command.

For usage guidelines for the IPv4 LISP Ingress Tunnel Router (ITR) functionality, see the `ip lisp itr` command.

For usage guidelines for the IPv4 LISP ETR functionality, see the `ip lisp etr` command.



#### Note

If you use the `ip lisp itr-etr` command and either of the `ip lisp itr` or `ip lisp etr` commands have already been configured, they are automatically removed from the configuration file. When configuring a device as both an Ingress Tunnel Router (ITR) and an ETR, use the command `ip lisp itr-etr` to enable both capabilities.

This command does not require a license.

### Examples

This example shows how to configure the IPv4 LISP Ingress Tunnel Router (ITR) and ETR functionality:

```
switch# configure terminal
switch(config)# ip lisp itr-etr
```



**Related Commands**

Command	Description
ip lisp etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).
ip lisp itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).

## ip lisp locator-down

To configure a locator from a locator set that is associated with an IPv4 endpoint identifier (EID)-prefix database-mapping to be unreachable (down), use the **ip lisp locator-down** command. To return the locator to be reachable (up), remove the configuration using the **no** form of this command.

**ip lisp locator-down** *EID-prefix/prefix-length* **locator**

**no ip lisp locator-down** *EID-prefix/prefix-length* **locator**

### Syntax Description

EID-prefix/prefix-length	IPv4 EID prefix and length advertised by the Cisco NX-OS device.
locator	IPv4 or IPv6 Routing Locator (RLOC) associated with this EID prefix.

### Command Default

An IPv4 or IPv6 locator associated with a configured IPv4 EID prefix block is considered reachable (up) unless an IGP routing protocol indicates it is down.

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When you configure LISP database parameters on an Ingress Tunnel Router (ITR) for specified IPv4 EID prefix blocks by using the `ip lisp database-mapping` command or the `ip lisp map-cache` command, the locators associated with these IPv4 EID prefix blocks are considered as reachable (up) by default. You can use the `ip lisp locator-down` command to configure a locator from a locator-set associated with the EID prefix database mapping to be down.

When you enter the `ip lisp locator-down` command, the Locator Status Bits (LSBs) for the configured locator is cleared when encapsulating packets to remote sites. ETRs at remote sites look for changes in the LSB when decapsulating LISP packets, and when the LSB indicates that a specific locator is down, the ETR refrains from encapsulating packets using this locator to reach the local site.



#### Note

If you enter the `ip lisp locator-down` command on an Ingress Tunnel Router (ITR) to indicate that a locator is unreachable (down) and the LISP site includes multiple Ingress Tunnel Routers (ITRs), you must enter the `ip lisp locator-down` command on all Ingress Tunnel Routers (ITRs) at the site to ensure that the site consistently tells remote sites that the configured locator is not reachable.

This command does not require a license.

### Examples

This example shows how to configure the locator down state for the EID prefix block:

```
switch# configure terminal
switch(config)# ip lisp locator-down 192.168.1.0/24 10.1.1.1
```

### Related Commands

Command	Description
ip lisp database-mapping	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.
ip lisp itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
ip lisp map-cache	Configures a static IPv4 EID prefix to the locator map-cache entry.

## ip lisp locator-vrf

To configure a nondefault virtual routing and forwarding (VRF) table to be referenced by any IPv4 locators, use the **ip lisp locator-vrf** command. To return to using the default routing table for locator address references, use the **no** form of this command.

**ip lisp locator-vrf** {vrf-name| default}

**no ip lisp locator-vrf** {vrf-name| default}

### Syntax Description

vrf-name	Name of the VRF instance to be referenced by IPv4 locator addresses.
default	Specifies that the default VRF should be referenced by the IPv4 locator addresses.

### Command Default

IPv4 locator addresses are associated with the default (global) routing table.

### Command Modes

VRF configuration mode

### Command History

Release	Modification
5.0(3)	This command was introduced.

### Usage Guidelines

When you configure Locator/ID Separation Protocol (LISP) in a nondefault VRF to keep EID prefixes in one VRF separate from EID prefixes in another VRF, and both EID VRFs share the same locator-based core network and same mapping database system infrastructure, these locator addresses must be reachable from the default VRF or a specified common VRF. Use the **ip lisp locator-vrf** command to specify the VRF to be associated with these locator addresses.

When you enter the **ip lisp locator-vrf** command, the locator addresses in any subsequent LISP commands are referenced to the specified VRF. For example, the locator addresses in the **ip lisp itr map-resolver** and **ip lisp etr map-server** commands refer to the VRF that you configured when you entered the **ip lisp locator-vrf** command. The Map Servers and Map Resolvers can also share the configuration from the locator VRF.



#### Note

When you configure mixed address families (for example, IPv4 EIDs and IPv6 locators or IPv6 EIDs and IPv4 locators), use the **ip lisp locator-vrf** command.

This command does not require a license.

**Examples**

In the following example, a LISP xTR is configured with three EID contexts red, blue, and green, and the locator VRF default. Red and blue are both using the RLOC of 10.10.10.1 if you enter the `ip lisp locator-vrf default` command. In addition, red and blue both inherit the globally defined map-resolver and Map Server located at 10.100.1.1 (configured at the end of this example). Both red and blue have an EID prefix of 172.16.0.0/24, but segmentation is maintained due to the unique LISP instance ID for each VRF context. The green context also uses the RLOC of 10.10.10.1 if you enter the `ip lisp locator-vrf default` command. However, green overrides the inheritance of the globally defined Map Resolver and Map Server by including the ones configured within the VRF context and located at 10.200.1.1. The locator for this locally defined map resolver or Map Server remains within the default VRF when you enter the `ip lisp locator-vrf default` command.

```
switch# configure terminal
switch(config)# vrf context red
switch(config-vrf)# ip lisp itr-etr
switch(config-vrf)# ip lisp database-mapping 172.16.0.0/24 10.10.10.1 priority 1 weight 1
switch(config-vrf)# lisp instance-id 111
switch(config-vrf)# ip lisp locator-vrf default
switch(config-vrf)# exit

switch(config)# vrf context blue
switch(config-vrf)# ip lisp itr-etr
switch(config-vrf)# ip lisp database-mapping 172.16.0.0/24 10.10.10.1 priority 1 weight 1
switch(config-vrf)# lisp instance-id 222
switch(config-vrf)# ip lisp locator-vrf default
switch(config-vrf)# exit

switch(config)# vrf context green
switch(config-vrf)# ip lisp itr-etr
switch(config-vrf)# ip lisp database-mapping 172.16.3.0/24 10.10.10.1 priority 1 weight 1
switch(config-vrf)# lisp instance-id 444
switch(config-vrf)# ip lisp locator-vrf default
switch(config-vrf)# ip lisp itr map-resolver 10.200.1.1
switch(config-vrf)# ip lisp etr map-server 10.200.1.1 key 3 xxxxxxxxxxxx
switch(config-vrf)# exit

switch(config)# ip lisp itr map-resolver 10.100.1.1
switch(config)# ip lisp etr map-server 10.100.1.1 key 3 xxxxxxxxxxxx
```

**Related Commands**

Command	Description
<code>ip lisp etr map-server</code>	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv4 EID prefixes.
<code>ip lisp itr map-resolver</code>	Configures the locator address of the LISP Map Resolver to which the Ingress Tunnel Router (ITR) sends Map-Request messages.

# ip lisp map-cache

To configure a static IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping relationship and its associated traffic policy or to statically configure the packet handling behavior associated with a specified destination IPv4 EID prefix, use the **ip lisp map-cache** command. To remove the configuration, use the **no** form of this command.

**ip lisp map-cache** *destination-EID-prefix-prefix-length* **locator** **priority** **priority** *priority* **weight** *weight*  
**no ip lisp map-cache** *destination-EID-prefix-prefix-length* **locator** **priority** **priority** *priority* **weight** *weight*  
**ip lisp map-cache** *destination-EID-prefix/prefix-length* {**drop**| **map-request**| **native-forward**}  
**no ip lisp map-cache** *destination-EID-prefix/prefix-length* {**drop**| **map-request**| **native-forward**}

## Syntax Description

destination-EID-prefix	Destination IPv4 EID prefix.
prefix-length	Prefix length.
locator	IPv4 or IPv6 Routing Locator (RLOC) associated with this EID prefix/prefix-length.
priority priority	Specifies the priority (value between 0 and 255) assigned to the RLOC. When multiple locators have the same priority, they may be used in load sharing. A lower value indicates a higher priority.
weight weight	Specifies the weight (value between 0 and 100) assigned to the locator. This command is used in order to determine how to load-share traffic between multiple locators when the priorities assigned to multiple locators are the same. The value represents the percentage of traffic to be load balanced.
drop	(Optional) Drops packets that match this map-cache entry.
map-request	(Optional) Sends a Map Request for packets.
native-forward	(Optional) Forwards packets natively that match this map-cache entry.

**Command Default** None

**Command Modes** Global configuration mode

**Command History**

Release	Modification
5.0(1.13)	This command was introduced.

**Usage Guidelines**

You can use of the `ip lisp map-cache` command to configure an ingress tunnel router (ITR) with a static IPv4 EID-to-RLOC mapping relationship and its associated traffic policy. For each entry, you must enter a destination IPv4 EID prefix block and its associated locator, priority, and weight. The IPv4 EID prefix/prefix length is the LISP EID prefix block at the destination site. The locator is an IPv4 or IPv6 address of the remote site where the IPv4 EID prefix can be reached. The locator address has a priority and weight that are used to define traffic policies when multiple RLOCs are defined for the same EID prefix block. You can enter this command up to four times for a given EID prefix. Static IPv4 EID-to-RLOC mapping entries configured when you enter the `ip lisp map-cache` command take precedence over dynamic mappings learned through Map-Request/Map-Reply exchanges.

You can also use the `ip lisp map-cache` command to statically configure the packet handling behavior associated with a specified destination IPv4 EID prefix. For each entry, a destination IPv4 EID prefix block is associated with a configured forwarding behavior. When a packet's destination address matches the EID prefix, one of the following packet handling occur:

- **drop**—Packets that match the destination IPv4 EID prefix are dropped. For example, this action may be useful when administrative policies define that packets should be prevented from reaching a site.
- **native-forward**—Packets that match the destination IPv4 EID prefix are natively forwarded without LISP encapsulation. Use this action when the destination site is known to always be reachable natively and LISP encapsulation should never be used.
- **map-request**—Packets that match the destination IPv4 EID prefix cause a Map-Request to be sent. The Map-Reply returned by this request allows subsequent packets that match this EID prefix to be Locator/ID Separation Protocol (LISP)-encapsulated. Use this action to troubleshoot map-request activities and other diagnostic actions.

This command does not require a license.

**Examples**

This example shows how to configure a destination EID-to-RLOC mapping and associated traffic policy for the IPv4 EID prefix block 192.168.1.0/24. In this example, the locator for this EID prefix block is 10.1.1.1 and the traffic policy for this locator has a priority of 1 and a weight of 100.

```
switch# configure terminal
switch(config)# ip lisp map-cache 192.168.1.0/24 10.1.1.1 priority 1 weight 100
```

This example shows how to configure a destination EID-to-RLOC mapping and associated traffic policy for the IPv4 EID prefix block 192.168.2.0/24 to drop. No traffic is forwarded to this destination as a result.

```
switch# configure terminal
switch(config)# ip lisp map-cache 192.168.2.0/24 drop
```

**Related Commands**

Command	Description
ip lisp database-mapping	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.
ip lisp itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
ip lisp map-cache-limit	Configures the maximum number of IPv4 LISP map-cache entries allowed to be stored by the Cisco NX-OS device.



## ip lisp map-cache-limit

To configure the maximum number of IPv4 Locator/ID Separation Protocol (LISP) map-cache entries allowed to be stored by the Cisco NX-OS device, use the **ip lisp map-cache-limit** command. To remove the configured map-cache limit, use the **no** form of this command.

**ip lisp map-cache-limit cache-limit [reserve-list list]**

**no ip lisp map-cache-limit cache-limit [reserve-list list]**

### Syntax Description

cache-limit	(Optional) Set of IPv4 EID prefixes in the referenced prefix list for which dynamic map-cache entries shall always be stored.
reserve-list list	(Optional) Specifies the maximum number of IPv4 LISP map-cache entries allowed to be stored on the Cisco NX-OS device. The valid range is from 0 to 10000.

### Command Default

1000

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ip lisp map-cache-limit** command to control the maximum number of IPv4 LISP map-cache entries that are allowed to be stored on the Cisco NX-OS device. An optional reserve list can be configured to guarantee that the Cisco NX-OS device always stores the referenced IPv4 EID prefixes.

LISP IPv4 map-cache entries are added in one of two ways: dynamically or statically. Dynamic entries are added when a valid Map-Reply message is returned for a Map Request message generated in response to a cache-miss lookup. Static entries are added when you enter the **ip lisp map-cache** command.

Dynamic map-cache entries are always added until the default or configured cache limit is reached. After the default or configured cache limit is reached, unless the optional reserve list is configured, no further dynamic entries are added and no further Map Requests are generated in response to cache-miss lookups until a free position is available.

When you do not configure an optional reserve-list keyword, dynamic entries are added on a first-in-first-added basis until the configured map-cache limit is reached. After that time, no new dynamic entries can be added.

If the reserve-list keyword is configured but the prefix list to which it refers is not configured, the results are the same as if the reserve-list keyword was not configured.

When you use the optional reserve-list keyword, a Map Request is generated and a new dynamic map-cache entry can be added only for IP v4 EID prefixes that are permitted by the prefix-list referenced by the reserve-list keyword. The new entry must be able to replace an existing dynamic entry so that the cache limit is maintained. The deleted dynamic entry is either a nonreserve idle map-cache entry or a nonreserve active map-cache entry. Idle map-cache entries are those entries that have seen no activity in the last 10 minutes. If all current dynamic entries are also permitted by the prefix-list referenced by the reserve list, no further dynamic entries can be added.

Existing dynamic IPv4 map-cache entries can time out due to inactivity or can be removed by the using the clear ip lisp map-cache command to create a free position in the map cache.

Static map-cache entries are always added, until the default or configured cache limit is reached. After the default or configured cache limit is reached, unless the optional reserve-list is configured, no further static entries are added.

When the optional reserve-list keyword is used, static entries are added on a first-in-first-added basis until the configured map-cache limit is reached. After that time, no new static entries can be added. If you use the reserve-list keyword but you do not configure the prefix-list to which it refers, the results are the same as if the reserve-list keyword was not configured.

When you use the optional reserve-list keyword, you can add a prefix list to a static entry that matches the reserve list, but only if it can replace an existing static entry or dynamic entry that does not match the reserve list prefix list.



**Caution**

When the optional reserve-list keyword is used, once the configured cache limit is reached, if all existing entries also match the prefix list and are not candidates for deletion, no new dynamic or static entries are added, even if a new dynamic or static entry also matches the reserve list prefix list.



**Note**

When you use the reserve-list command, make sure that the prefix list includes entries that match all expected prefixes in any Map-Reply, including the more-specifics. Appending le 32 to the end of all prefix-list entries for IPv4 prefixes. For example, if you want to match 153.16.0.0/16 and any of the more specific, you should specify ip prefix-list lisp-list seq 5 permit 153.16.0.0/16 le 32 in order to cover all replies within this range.

This command does not require a license.

**Examples**

This example shows how to configure a LISP cache limit of 2000 entries and a reserve list that references the IPv4 prefix-list LISP-v4-always:

```
switch# configure terminal
switch(config)# ip lisp map-cache-limit 2000 reserve-list LISP-v4-always
switch(config)# ip prefix-list LISP-v4-always seq 20 permit 172.16.0.0/16 le 32
```

**Related Commands**

Command	Description
ip lisp map-cache	Configures a static IPv4 EID prefix to the locator map-cache entry.

Command	Description
clear ip lisp map-cache	Clears the LISP IPv4 map cache on the local Cisco NX-OS device.

## ip lisp map-request-source

To configure an IPv4 or IPv6 address to be used as the source address for Locator/ID Separation Protocol (LISP) IPv4 Map-Request messages, use the **ip lisp map-request-source** command. To remove the configured Map-Request source address and return to the default behavior, use the **no** form of this command.

**ip lisp map-request-source source-address**

**no ip lisp map-request-source source-address**

### Syntax Description

source-address	IPv4 or IPv6 source address to be used in LISP IPv4 Map-Request messages.
----------------	---

### Command Default

The Cisco NX-OS device uses one of the locator addresses that you configure by using the `ipv6 lisp database-mapping` command as the default source address for LISP Map-Request messages.

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

A locator address that you configured by using the `ip lisp database-mapping` command is used as the source address for LISP IPv4 Map-Request messages. There are cases, however, where it might be necessary to configure the specified source address for these Map-Request messages. For example, when the ingress tunnel router (ITR) is behind a Network Address Translation (NAT) device, you might need to specify a source address that matches the NAT configuration to properly allow for return traffic.

When you enter the `ip lisp map-request-source` command on an Ingress Tunnel Router (ITR), the specified IPv4 or IPv6 locator is used by an Ingress Tunnel Router (ITR) as the source address for LISP IPv4 Map-Request messages. When you enter the `ip lisp map-request-source` command on a Map Server, this locator is used as the source address in the Encapsulated Control Message that carries a Map Request to an ETR.

This command does not require a license.

### Examples

This example shows how to configure an Ingress Tunnel Router (ITR) to use the source IP address 172.16.1.7 in its IPv4 Map-Request messages:

```
switch# configure terminal
switch(config)# ip lisp map-request-source 172.16.1.7
```

**Related Commands**

Command	Description
ip lisp database-mapping	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.

## ip lisp map-resolver

To configure a Cisco NX-OS device to act as an IPv4 Locator/ID Separation Protocol (LISP) Map-Resolver (MR), use the **ip lisp map-resolver** command. To remove LISP Map-Resolver functionality, use the **no** form of this command.

**ip lisp map-resolver**

**no ip lisp map-resolver**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

A Map Resolver receives a LISP Encapsulated Control Message (ECM) that contains a Map Request from a LISP Ingress Tunnel Router (ITR) directly over the underlying locator-based network. The Map Resolver decapsulates this message and forwards it on the LISP Alternative Topology (LISP-ALT), where it is delivered either to an ingress tunnel router (ITR) that is directly connected to the LISP-ALT and that is authoritative for the endpoint identifier (EID) being queried by the Map Request or to the Map Server that is injecting EID prefixes into the LISP-ALT on behalf of the authoritative ETR.

Map Resolvers also send Negative Map Replies directly back to an Ingress Tunnel Router (ITR) in response to queries for non-LISP addresses.

When deploying a LISP Map Resolver, follow these guidelines:

- When a Map Resolver is configured to use the LISP ALT for endpoint identifier to Routing Locator (EID-to-RLOC) mapping resolution, the Map-Resolver configuration must include the `ipv4 alt-vrf` command.
- When a Map Resolver is configured concurrently with a Map Server as a stand-alone system (when it is not connected to any ALT and it has full knowledge of the LISP mapping system for a private LISP deployment), using the `ipv4 alt-vrf` command is not required.
- When a Map Resolver supports a LISP deployment that is configured for virtualization, you must concurrently configure the Map Resolver with a Map-Server and see registrations from all ETRs in the LISP network to properly resolve Map Requests when instance IDs are used. A Map Resolver cannot forward a Map Request with an instance ID over the LISP ALT, as would be the case in a nonvirtualized configuration. The Map Resolver can only query EID tables that are maintained by the concurrent Map-Server for EID-to-RLOC mapping resolution in a virtualized LISP deployment.

This command does not require a license.

### Examples

This example shows how to configure the IPv4 LISP Map-Resolver functionality on the Cisco NX-OS device:

```
switch# configure terminal  
switch(config)# ip lisp map-resolver
```

### Related Commands

Command	Description
ip lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.

## ip lisp map-server

To configure the Cisco NX-OS device to act as an IPv4 Locator/ID Separation Protocol (LISP) Map-Server (MS), use the **ip lisp map-server** command. To remove the LISP Map-Server functionality, use the **no** form of this command.

**ip lisp map-server**

**no ip lisp map-server**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

LISP site commands are configured on the Map Server for a LISP egress tunnel router (ETR) that registers to it, including an authentication key, which must match the one also configured on the ETR. A Map Server receives Map-Register control packets from ETRs. When you configure the Map Server with a service interface to the LISP Alternative Topology (LISP-ALT), it injects aggregates for the registered EID prefixes into the LISP-ALT.

The Map Server also receives Map-Request control packets from the LISP-ALT, which it then forwards as a LISP Encapsulated Control Message (ECM) to the registered ETR that is authoritative for the EID prefix being queried. The ETR returns a Map-Reply message directly back to the Ingress Tunnel Router (ITR).

When deploying a LISP Map-Resolver, follow these guidelines:

- When a Map Resolver is configured to use the LISP-ALT for endpoint identifier to Routing Locator (EID-to-RLOC) mapping resolution, the Map-Resolver configuration must include the `ipv4 alt-vrf` command.
- When a Map Resolver is configured concurrently with a Map-Server as a stand-alone system (when it is not connected to any ALT and it has full knowledge of the LISP mapping system for a private LISP deployment), using the `ipv4 alt-vrf` command is not required.
- When a Map Resolver supports a LISP deployment that is configured for virtualization, you must concurrently configure the Map Resolver with a Map Server and see registrations from all ETRs in the LISP network to properly resolve Map Requests when instance IDs are used. A Map-Resolver cannot forward a Map Request with an instance ID over the LISP-ALT, as would be the case in a nonvirtualized configuration. The Map-Resolver can only query EID tables that are maintained by the concurrent Map Server for EID-to-RLOC mapping resolution in a virtualized LISP deployment.



This command does not require a license.

### Examples

This example shows how to configure the IPv4 LISP Map-Server functionality on the Cisco NX-OS device:

```
switch# configure terminal  
switch(config)# ip lisp map-server
```

### Related Commands

Command	Description
ip lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.

# ip lisp multicast

To configure the device to support Locator/ID Separation Protocol (LISP) to carry multicast traffic, when the Ingress Tunnel Router (ITR) or ETR function is enabled, use the **ip lisp multicast** command. To remove the LISP Map-Server functionality, use the **no** form of this command.

**ip lisp multicast**

**no ip lisp multicast**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** VRF configuration mode  
network-adminvdc-admin

## Command History

Release	Modification
6.2(2)	This command was introduced.

**Usage Guidelines** This command does not require a license.

## Examples

This example shows how to configure the device to support Locator/ID Separation Protocol (LISP) to carry multicast traffic:

```
switch# configure terminal
switch(config-vrf) # ip lisp multicast
switch(config-vrf) #
```

## Related Commands

Command	Description
ip lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.

# ip lisp nat-transversal

To configure an egress tunnel router (ETR) with a private locator that is sited behind a Network Address Translation (NAT) device to dynamically determine its NAT-translated public locator for use in Map-Register and Map-Reply messages, use the **ip lisp nat-transversal** command. To remove this functionality, use the **no** form of this command.

**ip lisp nat-transversal**

**no ip lisp nat-transversal**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Interface configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** When an ETR is sited behind a NAT device, its routing locator belongs to the private address space that the NAT device translates to a public globally routed address. The ETR needs to know this public global locator address because this address is required for use in Map-Register and Map-Reply messages.

When you enter the `ip lisp nat-transversal` command, the ETR determines its own public global locator dynamically. When configured, the ETR sends a LISP Echo-Request message to the configured Map Server out the interface under which this command is configured. The Map Server replies with an Echo-Reply message that includes the source address from the Echo Request, which is the NAT-translated public global locator address.

The `ip lisp nat-transversal` is useful when the dynamic keyword is used with the `ip lisp database-mapping` command in order to dynamically determine the routing locator rather than statically defining it.

This command does not require a license.

**Examples** This example shows how to configure the ETR to dynamically determine its public global routing locator when it is behind a NAT device:

```
switch# configure terminal
switch(config)# interface Ethernet 2/0
switch(config-if)# ip lisp nat-transversal
```

**Related Commands**

Command	Description
ip lisp database-mapping	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
ip lisp etr	Configures the switch to act as an IPv4 LISP Egress Tunnel Router (ETR).

## ip lisp proxy-etr

To configure the Cisco NX-OS device to act as the IPv4 Locator/ID Separation Protocol (LISP) Proxy Egress Tunnel Router (PETR), use the **ip lisp proxy-etr** command. To remove the LISP PETR functionality, use the **no** form of this command.

**ip lisp proxy-etr**

**no ip lisp proxy-etr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** The Cisco NX-OS device accepts LISP-encapsulated packets from an ingress tunnel router (ITR) or Proxy ITR (PITR) that are destined to non-LISP sites, deencapsulates them, and then forwards them natively toward the non-LISP destination.

PETR services may be necessary in several cases. For example, by default, when a LISP site forwards packets to a non-LISP site natively (not LISP encapsulated), the source IP address of the packet is that of a site EID. If the provider side of the access network is configured with strict unicast reverse path forwarding (uRPF) or an anti spoofing access-list, it would consider these packets to be spoofed and drop them because EIDs are not advertised in the provider default free zone (DFZ). Instead of natively forwarding packets destined to non-LISP sites, the Ingress Tunnel Router (ITR) encapsulates these packets using the site locator as the source address and the PETR as the destination address. Packets destined for LISP sites follow normal LISP forwarding processes and are sent directly to the destination ETR.



**Note** When an Ingress Tunnel Router (ITR) or PITR requires IPv4 PETR services, you must configure Ingress Tunnel Router (ITR) or PITR to forward IPv4 EID packets to the PETR by using the **ip lisp use-petr** command.

This command does not require a license.

**Examples**

This example shows how to configure the Cisco NX-OS device to act as an IPv4 LISP PETR:

```
switch# configure terminal  
switch(config)# ip lisp proxy-etr
```

**Related Commands**

Command	Description
ip lisp etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).
ip lisp use-petr	Configures an Ingress Tunnel Router (ITR) or PITR to use the PETR for traffic destined to non-LISP IPv4 destinations.

# ip lisp proxy-itr

To configure a Cisco NX-OS device to act as an IPv4 Locator/ID Separation Protocol (LISP) Proxy Ingress Tunnel Router (PITR), use the **ip lisp proxy-itr** command. To remove the LISP PITR functionality, use the **no** form of this command.

**ip lisp proxy-itr ipv4-local-locator [ipv6-local-locator]**

**no ip lisp proxy-itr ipv4-local-locator [ipv6-local-locator]**

## Syntax Description

ipv4-local-locator	IPv4 locator address used as a source address for encapsulation of data packets, a data probe, or a Map-Request message.
ipv6-local-locator	(Optional) IPv6 locator address used as a source address for encapsulation of data packets, a data probe, or a Map-Request message when the locator-hash function returns a destination Routing Locator (RLOC) in the IPv6 address family.

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The Cisco NX-OS device receives native packets from non-LISP sites that are destined for LISP sites, encapsulates them, and forwards them to the ETR that is authoritative for the destination LISP site EID.

PITR services are required to provide interworking between non-LISP sites and LISP sites. For example, when connected to the Internet, a PITR acts as a gateway between the legacy Internet and the LISP-enabled network. The PITR must advertise one or more highly aggregated endpoint identifier (EID) prefixes on behalf of LISP sites into the underlying default free zone (DFZ) (that is the Internet) and act as an Ingress Tunnel Router (ITR) for traffic received from the public Internet.

When you enable PITR services by using the **ip lisp proxy-itr** command, the PITR creates LISP-encapsulated packets when it sends a data packet to a LISP site, sends a data probe, or sends a Map-Request message. The outer (LISP) header address family and source address are determined as follows:

- When the locator-hash function returns a destination Routing Locator (RLOC) within the IPv4 address family, the address **ipv4-local-locator** is used as the source address from the locator namespace.

- When the locator-hash function returns a destination RLOC within the IPv6 address family (assuming the optional address ipv6-local-locator is entered), it is used as a source locator for encapsulation.

When you configure a switch to function as an IPv4 PITR, you can also configure it to use the LISP-ALT for IPv4 EID-to-RLOC mapping resolution. When configured to use the LISP-ALT, the PITR sends its map request messages directly over the LISP ALT using the virtual routing and forwarding (VRF) when you enter the `ip lisp alt-vrf` command. A PITR can send a Map Request to a configured Map Resolver for EID-to-RLOC mapping resolution as an alternative to sending a Map Request directly over the LISP-ALT. (See the `ipv4 map-resolver` command) When using a PITR in a virtualized LISP deployment, you must configure the PITR to use a Map-Resolver for EID-to-RLOC mapping resolution and not the LISP-ALT because the LISP-ALT does not support virtualization.

**Note**

A switch that is configured as an Ingress Tunnel Router (ITR) performs a check to see if the source of any packet intended for LISP encapsulation is within the address range of a local EID prefix. A Cisco NX-OS device configured as a PITR does not perform this check. Unlike the Cisco IOS LISP implementation, in Cisco NX-OS you can configure a Cisco NX-OS device to support both Ingress Tunnel Router (ITR) and PITR functionality at the same time. If you configure a Cisco NX-OS device as an Ingress Tunnel Router (ITR) and as a PITR, preference goes to PITR functionality for packet processing.

This command does not require a license.

**Examples**

This example shows how to configure the LISP PITR functionality on the Cisco NX-OS device and how to encapsulate packets using a source locator:

```
switch# configure terminal
switch(config)# ip lisp proxy-itr 10.1.1.1
```

**Related Commands**

Command	Description
<code>ip lisp alt-vrf</code>	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.
<code>ip lisp itr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).



## ip lisp shortest-eid-prefix-length

To configure the shortest IPv4 endpoint identifier (EID)-prefix mask length that is acceptable to an ingress tunnel router (ITR) or Proxy ITR (PITR) in a received Map-Reply message or to an ETR in the mapping-data record of a received Map Request, use the **ip lisp shortest-eid-prefix-length** command. To return to the default configuration, use the **no** form of this command.

**ip lisp shortest-eid-prefix-length IPv4-EID-prefix-length**

**no ip lisp shortest-eid-prefix-length IPv4-EID-prefix-length**

### Syntax Description

IPv4-EID-prefix-length	Shortest IPv4 EID prefix-length accepted from a Map Reply or data record in a Map Request. The range is from 0 to 32.
------------------------	---

### Command Default

a/6

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When an Ingress Tunnel Router (ITR) or PITR receives a Map-Reply message, the mapping data it contains includes the EID mask length for the returned EID prefix. By default, the shortest EID prefix mask length accepted by an Ingress Tunnel Router (ITR) or PITR for an IPv4 EID prefix is a /16. You can use the `ip lisp shortest-eid-prefix-length` command to change this default. For example, it might be necessary for a PITR to accept a shorter (coarser) prefix if one exists.

When an ETR receives a Map-Request message, it might contain a mapping data record that the ETR can cache and possibly use to forward traffic depending on the configuration of the `ip lisp etr accept-map-request-mapping` command. Use the `ip lisp shortest-eid-prefix-length` command to change the shortest prefix length accepted by the ETR. In this case, the check for the shortest EID prefix mask length is done prior to the verifying Map-Request, if also configured. If the EID prefix mask length is less than the configured value, the verifying Map Request is not sent and the mapping data is not accepted.

This command does not require a license.

### Examples

This example shows how to configure the Cisco NX-OS device to accept a minimum IPv4 EID prefix length:

```
switch# configure terminal
switch(config)# ip lisp shortest-eid-prefix-length 12
```

**Related Commands**

Command	Description
ip lisp etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).
ip lisp itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
ip lisp proxy-itr	Configures the Cisco NX-OS device to act as an IPv4 LISP Proxy Ingress Tunnel Router (PITR).

## ip lisp source-locator

To configure a source locator to be used for IPv4 Locator/ID Separation Protocol (LISP)-encapsulated packets, use the **ip lisp source-locator** command. To remove the configured source locator, use the **no** form of this command.

**ip lisp source-locator interface**

**no ip lisp source-locator interface**

### Syntax Description

interface	Name of the interface whose IPv4 address should be used as the source locator address for outbound LISP-encapsulated packets.
-----------	---

### Command Default

The IPv4 address of the outbound interface is used by default as the source locator address for outbound LISP encapsulated packets.

### Command Modes

Interface configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When sending a LISP-encapsulated packet (data or control message), the Cisco NX-OS device performs a destination lookup to determine the appropriate outgoing interface. By default, the IPv4 address of this outgoing interface is used as the source locator for the outbound LISP encapsulated packet.

You might need to use the IPv4 address of a different interface as the source locator for the outbound LISP-encapsulated packets rather than that of the outgoing interface. For example, when an Ingress Tunnel Router (ITR) has multiple egress interfaces, you might configure a loopback interface for stability purposes and instruct the Ingress Tunnel Router (ITR) to use the address of this loopback interface as the source locator for the outbound LISP-encapsulated packets rather than one or both of the physical interface addresses. This command is also important for maintaining locator consistency between the two LISP Tunnel Routers (xTRs) when RLOC-probing is used.

This command does not require a license.

### Examples

This example shows how to configure the source locator:

```
switch# configure terminal
switch(config)# interface Ethernet2/0
switch(config-if)# ip lisp source-locator Loopback0
```

```
switch(config-if)# interface Ethernet2/1
switch(config-if)# ip lisp source-locator Loopback0
```

**Related Commands**

Command	Description
<b>ip lisp itr</b>	Configures the switch to act as an IPv4 LISP Ingress Tunnel Router (ITR).

# ip lisp translate

To configure IPv4 Locator/ID Separation Protocol (LISP) translation mapping, use the **ip lisp translate** command. To remove IPv4 LISP translation mappings and return to the default value, use the **no** form of this command.

**ip lisp translate inside IPv4-inside-EID outside IPv4-outside-EID**

**no ip lisp translate inside IPv4-inside-EID outside IPv4-outside-EID**

## Syntax Description

inside	Indicates that the inside (non routable) IPv4 endpoint identifier (EID) prefix follows.
IPv4-inside-EID	Nonroutable IPv4 address associated with an inside EID prefix.
outside	Indicates that the outside (routable) IPv4 EID prefix follows.
IPv4-outside-EID	IPv4 address associated with an outside EID prefix.

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When you configure a LISP Ingress Tunnel Router (ITR) or Egress Tunnel Router (ETR) with a nonroutable EID prefix and you want to replace it with a routable EID prefix, use the **ip lisp translate** command. A LISP device that acts as an Ingress Tunnel Router (ITR) and detects a nonroutable EID in the source IPv4 address field replaces it with the routable EID when you use the **inside** and **outside** keyword. In the opposite direction when acting as an ETR, it replaces the routable EID referred to by the **outside** keyword with the no-routable EID referred to by the **inside** keyword.



### Note

The outside EID address can be assigned to the Cisco NX-OS device itself, in which case it responds to Address Resolution Protocol (ARP) requests, ICMP echo-requests (ping) and any other packet sent to this address. When you do not assign the outside EID to the device, the address does not answer ARP requests.

This feature may be useful if you want to upgrade but you want to continue to communicate with non-LISP sites. An alternative approach for providing communications between LISP and non-LISP sites is to use Proxy-ITR services. See the `ip lisp proxy-itr` command for further details. Both proxy-ITR and Network Address Translation (NAT) translation services, also referred to as Interworking services, are described in draft-ietf-lisp-interworking-00.

This command does not require a license.

### Examples

This example shows how to configure LISP to translate the inside address to the outside address:

```
switch# configure terminal
switch(config)# ip lisp translate inside 192.168.10.1 outside 10.1.10.1
```

### Related Commands

Command	Description
<code>ip lisp etr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).
<code>ip lisp itr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
<code>ip lisp proxy-itr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Proxy Ingress Tunnel Router (PITR).

## ip lisp use-petr

To configure a Cisco NX-OS device to use an IPv4 LISP Proxy Egress Tunnel Router (PETR), use the **ip lisp use-petr** command. To remove the use of a LISP PETR, use the **no** form of this command.

**ip lisp use-petr locator-address**

**no ip lisp use-petr locator-address**

### Syntax Description

locator-address	IPv4 or IPv6 locator address of the PETR.
-----------------	---

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When the use of PETR services is enabled, instead of natively forwarding packets destined to non-LISP sites, these packets are LISP-encapsulated and forwarded to the PETR, where these packets are then deencapsulated and forwarded natively toward the non-LISP destination. An Ingress Tunnel Router (ITR) or PITR can be configured to use PETR services.

PETR services might be necessary in several cases. By default, when a LISP sites forwards packets to a non-LISP site natively (not LISP encapsulated), the source IP address of the packet is that of a site endpoint identifier (EID). If the provider side of the access network is configured with strict unicast reverse path forwarding (uRPF), it considers these packets to be spoofed and drops them because EIDs are not advertised in the provider default free zone (DFZ). In this case, instead of natively forwarding packets destined to non-LISP sites, the Ingress Tunnel Router (ITR) encapsulates these packets using the site locator as the source address and the PETR as the destination address. Packets destined for LISP sites follow normal LISP forwarding processes and are sent directly to the destination ETR.



#### Note

Because LISP supports mixed protocol encapsulations, the locator specified for the PETR can either be an IPv4 or IPv6 address. Up to eight PETRs can be configured per address family.

This command does not require a license.

**Examples**

This example shows how to configure the Ingress Tunnel Router (ITR) to use the PETR with the IPv4 locator:

```
switch# configure terminal  
switch(config)# ip lisp use-petr 10.1.1.1
```

**Related Commands**

Command	Description
ip lisp proxy-etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Proxy Egress Tunnel Router (PETR).



## ip pim rp-address

To configure the static rendezvous point RP for a group range, use the **ip pim rp-address** command. To remove the static RP for a group range, use the **no** form of this command.

**ip pim rp-address** *rp-address* **group-list** *access-list*

**no ip lisp use-petr** *rp-address* **group-list** *access-list*

### Syntax Description

rp-address	Specifies the IP address of router which is the RP for the group range.
group-list	Specifies the group range for the static RP.
access-list	Group range prefixes.

### Command Default

None

### Command Modes

VRF configuration mode

### Command History

Release	Modification
6.2(2)	This command was introduced.

### Usage Guidelines

This command does not require a license.

### Examples

This example shows how to configure the static RP for a group range:

```
switch# configure terminal
switch(config)# vrf context management
switch(config-vrf)# ip pim rp-address 10.0.0.1 group-list 224.0.0.0/8
switch(config-vrf)#
```

### Related Commands

Command	Description
ip lisp proxy-etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Proxy Egress Tunnel Router (PETR).

## ip pim ssm

To define the Source Specific Multicast (SSM) range of IP, use the **ip pim ssm** command. To remove the SSM range of IP, use the **no** form of this command.

**ip pim ssm range access-list**

**no ip lisp use-petr access-list**

### Syntax Description

access-list	Group range prefixes.
-------------	-----------------------

### Command Default

None

### Command Modes

VRF configuration mode

### Command History

Release	Modification
6.2(2)	This command was introduced.

### Usage Guidelines

This command does not require a license.

### Examples

This example shows how to configure the Source Specific Multicast (SSM) range of IP:

```
switch# configure terminal
switch(config)# vrf context management
switch(config-vrf)# ip pim ssm 224.0.0.0/8
```

### Related Commands

Command	Description
ip lisp proxy-etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Proxy Egress Tunnel Router (PETR).

# ip route

To configure a default route to the upstream next hop for all IPv4 destinations, use the **ip route** command. To remove the default route to the upstream next hop for all IPv4 destinations, use the **no** form of this command.

**ip route** *ipv4-prefix next-hop*

**no ip route** *ipv4-prefix next-hop*

## Syntax Description

ipv4-prefix	IP prefix in i.i.i.i format.
next-hop	IP network mask in m.m.m.m format.

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
6.2(2)	This command was introduced.

## Usage Guidelines

This command does not require a license.

## Examples

This example shows how to configure a default route to the upstream next hop for all IPv4 destinations:

```
switch# configure terminal
switch(config)# ip route 0.0.0.0 0.0.0.0 10.0.0.1
```

## Related Commands

Command	Description
ip lisp proxy-etr	Configures the Cisco NX-OS device to act as an IPv4 LISP Proxy Egress Tunnel Router (PETR).

## ipv6 lisp alt-vrf

To configure the virtual routing and forwarding (VRF) instance that the Cisco NX-OS device uses when sending map requests for an IPv6 end point identifier (EID) to Routing Locator mapping directly over the Locator/ID Separation Protocol Alternative Topology (LISP-ALT), use the **ipv6 lisp alt-vrf** command. To remove the reference to a VRF, use the **no** form of this command.

**ipv6 lisp alt-vrf vrf-name**

**no ipv6 lisp alt-vrf vrf-name**

### Syntax Description

vrf-name	Name assigned to the LISP ALT VRF.
----------	------------------------------------

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the `ipv6 lisp alt-vrf` command to configure which virtual routing and forwarding (VRF) instance that the LISP device should use for control plane mapping resolution functions.

You must use the `ipv6 lisp alt-vrf` command for all devices that connect to the ALT to exchange LISP control plane messages for mapping. These devices include LISP Map-Server (MS), Map Resolver (MR), and Proxy Ingress Tunnel Router (PITR) devices, and directly ALT-connected xTRs.

Follow these guidelines when using this command:

- The LISP ALT does not support virtualization. A Map-Request with an instance-id cannot be forwarded over the LISP ALT. When you configure a LISP device for virtualization, you must not use the `ipv6 lisp alt-vrf` command.
- When you configure instance IDs on an MS (see the `LISP Site eid-prefix` command), you must configure the MS as a standalone because virtualization of the LISP ALT is not supported.
- When you configure a Cisco NX-OS device as a standalone MS or MR without virtualization, you need not use the `ipv6 lisp alt-vrf` command.
- When you configure a Cisco NX-OS device as a LISP PITR, you can use the `ip lisp alt-vrf` command if you are using the ALT for EID-to-RLOC mapping resolution. You can configure PITRs to send a Map-Request to a configured Map-Resolver for EID-to-RLOC mapping resolution as an alternative to sending a Map-Request directly over the LISP ALT. When using a PITR in a virtualized LISP deployment,

you must configure the PITR to use a Map-Resolver for EID-to-RLOC mapping resolution, not the LISP ALT because the LISP ALT does not support virtualization.

**Note**

When you use the `ip lisp alt-vrf` command, the referenced VRF must already have been created by using the `vrf context` command. In addition, the corresponding configurations for connecting the LISP device to the ALT, including the generic routing encapsulation (GRE) tunnel interface(s) and any routing that is associated with the VRF (static or dynamic) you must also have created.

**Examples**

This example shows how to configure the VRF named `lisp` and then configure LISP to use this VRF when resolving IPv6 EID-to-RLOC mappings:

```
switch# configure terminal
switch(config)# vrf context lisp
switch(config-vrf)# exit
switch(config)# ipv6 lisp alt-vrf lisp
```

**Related Commands**

Command	Description
<code>ipv6 lisp itr map-resolver</code>	Configures the locator address of the LISP Map-Resolver to which the Ingress Tunnel Router (ITR) sends Map-Request messages.
<code>ipv6 lisp itr</code>	Configures the Cisco NX-OS device to act as a LISP Ingress Tunnel Router (ITR).
<code>ipv6 lisp pitr</code>	Configures the Cisco NX-OS device to act as a LISP Proxy Ingress Tunnel Router (PITR).

## ipv6 lisp database-mapping

To configure an IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping relationship and its associated traffic policy, use the **ipv6 lisp database-mapping** command. To remove the configured database mapping, use the **no** form of this command.

**ipv6 lisp database-mapping EID-prefix {locator| dynamic} priority priority weight weight**

**no ipv6 lisp database-mapping EID-prefix {locator| dynamic} priority priority weight weight**

### Syntax Description

EID-prefix	IPv4 EID prefix and length.
locator	IPv4 or IPv6 RLOC associated with this EID prefix.
dynamic	Allows the RLOC associated with this EID to be determined dynamically.
priority priority	Specifies the priority (value between 0 and 255) assigned to the RLOC. When multiple locators have the same priority they can be used in load-shared fashion. A lower value indicates a higher priority.
weight weight	Specifies the weight (value between 0 and 100) assigned to the locator. Use this keyword to determine how to load-share traffic between multiple locators when the priorities assigned to multiple locators are the same. The weight argument represents the percentage of traffic to be load-shared.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ipv6 lisp database-mapping** command to configure the LISP database parameters for the specified IPv4 EID prefix block, including its associated locator, priority and weight. The IPv6 EID prefix is the LISP IPv6 EID prefix block that is associated with the site that the Cisco NX-OS Series device registers as being authoritative with a Map Server. The locator is typically the IPv4 or IPv6 address of a loopback interface but

can be the IPv4 or IPv6 address of any interface used as the Routing Locator (RLOC) address for the EID prefix assigned to the site. A priority and weight are used to define traffic policies when multiple RLOCs apply to the same EID prefix block.

When you configure a Cisco NX-OS Series device as an egress tunnel router (ETR), these LISP database-mapping parameters are advertised within a Map-Reply message to indicate the ingress traffic preferences of the site for the associated EID prefix block. An ingress tunnel router (ITR) then selects a source locator (outer header) address for encapsulating packets destined to the EID prefix based on these advertised parameters.

When a LISP site has multiple locators associated with the same EID prefix block, you use multiple `ipv6 lisp database mapping` commands to configure all of the locators for a given EID prefix block. Each locator can be assigned with the same or a different priority value between 0 and 255. When multiple locators are assigned different priority values, the priority value alone is used to determine which locator to prefer. A lower value indicates a more preferable path. A value of 255 indicates that the locator must not be used for unicast traffic forwarding.

When multiple locators have the same priority, they can be used in a load-sharing manner. In this case, for a given priority, the weight given to each locator is used to determine how to load-balance unicast packets between them. The weight is a value between 0 and 100 and represents the percentage of traffic to be load shared to that locator. If you assign a nonzero weight value to any locator for a given EID prefix block, you must assign all locators with the same priority for that same EID prefix block with a nonzero weight value. The sum of all weight values must equal 100. If you assign a weight value of zero to any locator for a given EID prefix block, you must assign all locators with the same priority for that same EID prefix block a weight value of zero. A weight value of zero indicates to an ITR that receives the Map-Reply that it can decide how to load-share traffic destined to that EID prefix block.

When you assign a LISP site with multiple IPv6 EID prefixes, the `ipv6 lisp database-mapping` is configured for each IPv4 EID prefix assigned to the site and for each locator that has a reachable IPv6 EID prefix.

When multiple ETRs are used at a LISP site, you must enter the `ipv6 lisp database-mapping` command on all ETRs for all locators to make an IPv4 EID prefix block reachable even when the locator is not local to the specific ETR that is being configured.

If the ETR receives its RLOC through a dynamic process such as DHCP, or if it is sited behind a Network Address Translation (NAT) device and the routing locator belongs to the private address space that the NAT device translates to a public globally routed address, you might not be able to specify a locator in the `ip lisp database-mapping` entry. Add the `dynamic` keyword with the `ipv6 lisp database-mapping` command so that the RLOC for this Cisco NX-OS device will be determined dynamically rather than being statically defined in each `ip lisp database-mapping` entry.

When an ETR is sited behind NAT, it needs to know the public global locator address; this address that is required for Map-Register and Map-Reply messages. You should enter the `{ip | ipv6} lisp nat-traversal` command. For more information, see the `{ip | ipv6} lisp nat-traversal` command.

This command does not require a license.

## Examples

This example shows how to configure lisp database-mapping entries for a single IPv6 EID prefix block and two IPv4 locators that are associated with the EID prefix block:

```
switch# configure terminal
switch(config)# ipv6 lisp database-mapping 2001:DB8:BB::/48 10.1.1.1 priority 1 weight 100
switch(config)# ipv6 lisp database-mapping 2001:DB8:BB::/48 10.1.2.1 priority 1 weight 100
```

**Related Commands**

Command	Description
ipv6 lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server that ETR registers its IPv6 EID prefixes.
ipv6 lisp locator-down	Configures an IPv4 or IPv6 locator from a locator set associated with the IPv6 EID prefix database mapping to be down.
ipv6 lisp map-cache	Configures a static IPv6 EID prefix to the the locator map-cache entry.
ipv6 lisp nat-transversal	Configures an ETR with a private locator that is sited behind a NAT device to dynamically determine its NAT-translated public globally routed locator address for the applied interface.



# ipv6 lisp etr

To configure a Cisco NX-OS device to act as an IPv6 Locator/ID Separation Protocol (LISP) Egress Tunnel Router (ETR), use the **ipv6 lisp etr** command. To remove LISP ETR functionality, use the **no** form of this command.

**ipv6 lisp etr**

**no ipv6 lisp etr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** Use the `ipv6 lisp etr` command to enable the Cisco NX-OS device to perform IPv4 LISP Egress Tunnel Router (ETR) functionality. When you configure a Cisco NX-OS device as an IPv4 ETR, also use `ipv6 lisp database-mapping` command so that the ETR knows what EID prefix blocks and corresponding locators are used for the LISP site. In addition, you should configure the ETR to register with a Map-Server by using the `ipv6 lisp etr map-server` command, or to use static LISP EID-to-RLOC mappings by using the `ipv6 lisp map-cache` command in order to participate in LISP networking.

When a map-cache entry contains mixed locators (both IPv4 and IPv6 RLOCs) and an Ingress Tunnel Router (ITR) encapsulates using an IPv4 locator, you must configure the ETR that is assigned with the IPv4 locator by using the `ipv6 lisp etr` command. When an IPv6 locator is used by an Ingress Tunnel Router (ITR), you must configure the ETR that is assigned with the IPv6 locator by using the `ipv6 lisp etr` command.



**Note** You configure an ETR as an Ingress Tunnel Router (ITR). However, the LISP architecture does not require that you do so. When configuring a device as both an Ingress Tunnel Router (ITR) and an ETR, use the `ipv6 lisp itr-etr` command to enable both capabilities.

This command does not require a license.

**Examples** This example shows how to configure IPv6 LISP ETR functionality on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# ipv6 lisp etr
```

**Related Commands**

Command	Description
ipv6 lisp database-mapping	Specifies to configure an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
ipv6 lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map-Server to which an ETR should register for its IPv6 EID prefixes.
ipv6 lisp itr	Configures the Cisco NX-OS device to act as an IPv6 LISP Ingress Tunnel Router (ITR)
ipv6 lisp map-cache	Configures a static IPv6 EID prefix to locator map-cache entry.

# ipv6 lisp etr accept-map-request-mapping

To configure an Egress Tunnel Router (ETR) to cache IPv6 mapping data contained in a Map-Request message, use the **ipv6 lisp etr accept-map-request-mapping** command. To remove this functionality, use the **no** form of this command.

**ipv6 lisp etr accept-map-request-mapping [verify]**

**no ipv6 lisp etr accept-map-request-mapping [verify]**

## Syntax Description

verify	(Optional) Specifies that mapping data should be cached but not used for forwarding packets until the ETR can send its own Map Request to one of the locators from the mapping data record and receive a Map Reply with the same data in response.
--------	--

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When an ETR receives a Map-Request message, this message might contain mapping data for the invoking IPv4 source-EID packet. By default, the ETR ignores mapping data included in Map-Request messages. However, by entering the **ipv6 lisp etr accept-map-request-mapping** command, the ETR caches the mapping data in its map cache and immediately uses it to forward packets.

When you use the optional **verify** keyword, the ETR still caches the mapping data but does not forward packets until the ETR can send its own Map Request to one of the locators from the mapping data record and receive the same data in a Map-Reply message.



### Note

For security purposes, we recommend that you use the **verify** keyword. Unless you deploy the ETR and Ingress Tunnel Router (ITR) in a trusted environment, you should use the optional **verify** keyword. In a trusted environment, if you do not use the optional **verify** keyword, the new mapping occurs in one-half round-trip-time (RTT) as compared with the normal Map-Request/Map-Reply exchange process.

When you enable and then later disable this command, you must enter the **clear ipv6 lisp map-cache** command to clear any map-cache entries that are currently in the tentative state. Map-cache entries can remain in the

tentative state for up to one minute; therefore, you might want to clear these entries manually when this command is removed.

This command does not require a license.

### Examples

This example shows how to configure the ETR to accept and cache IPv6 mapping data included in Map-Request messages and verify its accuracy prior to using this data to forward packets:

```
switch# configure terminal
switch(config)# ipv6 lisp etr accept-map-request-mapping verify
```

### Related Commands

Command	Description
ipv6 lisp etr	Configures the Cisco NX-OS device to act as an IPv6 LISP Egress Tunnel Router (ETR).
clear ipv6 lisp map-cache	Clears the LISP IPv6 map cache on the local Cisco NX-OS device.

## ipv6 lisp etr glean-mapping

To configure an egress tunnel router (ETR) to add inner header (EID) source address to outer header (RLOC) source address mappings it to its endpoint identifier to Routing Locator (EID-to-RLOC) cache (map-cache), use the **ipv6 lisp etr glean-mapping** command. To remove this functionality, use the **no** form of this command.

**ipv6 lisp etr glean-mapping [verify]**

**no ipv6 lisp etr glean-mapping [verify]**

### Syntax Description

verify	Optional) Specifies that gleaned EID-to-RLOC mapping data should be cached but not used for forwarding packets until the ETR can send its own Map Request to the originating Ingress Tunnel Router (ITR) and receive a Map Reply with the same data in response.
--------	--

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When an ETR receives Locator/ID Separation Protocol (LISP)-encapsulated packets, the inner header EID source address and outer header RLOC source address should match an entry found in the map cache as determined by the results of a Map-Request/Map-Reply exchange. When a host moves from one ingress tunnel router (ITR) to another ITR, the EID-to-RLOC mapping changes because the new ITR can encapsulate packets to the ETR using a different locator. By entering the **ipv6 lisp etr glean-mapping** command, the ETR recognizes the new locator information for the moved host's EID and updates the map cache with this information.

The learned EID-to-RLOC map-cache entries are stored with a priority of 1 and a weight of 100.

When you enter the optional **verify** keyword, the ETR caches the learned EID-to-RLOC mapping data but does not forward packets until the ETR can send its own Map Request to the originating Ingress Tunnel Router (ITR) and receive a Map Reply. The gleaned locator will then be used. When you specify the **verify** keyword, the locator is used to forward traffic and all packets are dropped until the Map Reply is returned.

**Note**

For security purposes, we recommend that you use the verify keyword. Unless you deploy the ETR and Ingress Tunnel Router (ITR) in a trusted environment, you should use the optional verify keyword. In a trusted environment, if you do not use the optional verify keyword, the new mapping occurs in one-half round-trip-time (RTT) as compared with the normal Map-Request/Map-Reply exchange process.

This command does not require a license.

**Examples**

This example shows how to configure the ETR to glean and cache IPv6 mapping data included in Map-Request messages and verify its accuracy prior to using this data to forward packets:

```
switch# configure terminal
switch(config)# ipv6 lisp etr glean-mapping verify
```

**Related Commands**

Command	Description
ipv6 lisp etr	Configures the Cisco NX-OS device to act as an IPv6 LISP Egress Tunnel Router (ETR).

## ipv6 lisp etr map-cache-ttl

To configure the Time-to-live (TTL) value inserted into Locator/ID Separation Protocol (LISP) IPv6 Map-Reply messages, use the **ipv6 lisp etr map-cache-ttl** command. To remove the configured TTL value and return to the default value, use the **no** form of this command.

**ipv6 lisp etr map-cache-ttl time-to-live**

**no ipv6 lisp etr map-cache-ttl time-to-live**

### Syntax Description

time-to-live	Value, in minutes, to be inserted in the TTL field in Map-Reply messages. The range is from 60 to 10080.
--------------	--

### Command Default

1440

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the `ipv6 lisp etr map-cache-ttl` command to change the default value associated with the TTL field in IPv4 Map-Reply messages. Use this command when you want to change the default TTL that remote Ingress Tunnel Routers (ITRs) cache and use for your site's IPv4 EID prefix. The default value is 1440 minutes (24 hours). The minimum value cannot be less than 60 minutes, and the maximum cannot be greater than 10080 minutes (one week).

This command does not require a license.

### Examples

This example shows how to configure the ETR to use a TTL in its IPv6 Map-Reply messages:

```
switch# configure terminal
switch(config)# ipv6 lisp etr map-cache-ttl 120
```

### Related Commands

Command	Description
ipv6 lisp etr	Configures the Cisco NX-OS device to act as an IPv6 LISP Egress Tunnel Router (ETR).

## ipv6 lisp etr map-server

To configure the IPv4 or IPv6 locator address of the Locator/ID Separation Protocol (LISP) Map Server to be used by the egress tunnel router (ETR) when registering for IPv4 EIDs, use the **ipv6 lisp etr map-server** command. To remove the configured locator address of the LISP Map Server, use the **no** form of this command.

**ipv6 lisp etr map-server map-server-address** {[key key-type authentication-key] proxy-reply}

**no ipv6 lisp etr map-server map-server-address** {[key key-type authentication-key] proxy-reply}

### Syntax Description

map-server-address	IPv4 or IPv6 address of the Map Server.
key	(Optional) Specifies how the keytype that indicates how the following SHA-1 password (key) is encoded.
key-type	Key type. Type (0) indicates that a clear text password follows, Type (3) indicates that a 3DES encrypted key follows, and Type (7) indicates that a Cisco Type 7 encrypted password follows.
authentication-key	Password used for computing the SHA-1 HMAC hash that is included in the header of the Map-Register message.
proxy-reply	Specifies that the ETR should indicate to the Map Server through a Map Register message that the Map Server should send Map Replies on behalf of the site.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the **ipv6 lisp etr map-server** command to configure the IPv4 or IPv6 locator of the Map Server to which the ETR registers for its IPv4 EID(s). A password used for a SHA-1 HMAC hash that is included in the header of the Map-Register message must also be provided. You can configure the ETR to register with a maximum of two Map Servers per EID address family. Once the ETR registers with the Map-Server(s), the Map Server(s) begin to advertise the EID prefix block(s) and RLOC(s) for the LISP site.



You can enter the SHA-1 HMAC password in unencrypted (cleartext) form or encrypted form. To enter an unencrypted password, specify a key-type value of 0. To enter a 3DES-encrypted password, specify a key-type value of 3. To enter a Cisco-encrypted password, specify a key-type value of 7.

**Caution**

A Map-Server authentication key entered in cleartext form will automatically be converted to Type 3 (encrypted) form.

**Note**

You must also configure the Map Server with IPv4 EID prefixes that match the IPv4 EID prefixes configured on this ETR by using the `ipv6 lisp database-mapping` command, as well as a password that matches the one provided with the `key` keyword on this ETR.

- When you enter the `ipv6 lisp database-mapping` command, the ETR does not need to run the Locator/ID Separation Protocol Alternative Topology (LISP-ALT) for EID-to-RLOC mapping resolution. You can remove all commands related to the Alternative Topology-Virtual Routing and Forwarding (VRF) (ALT-VRF).

**Note**

When you use the `proxy-reply` keyword, the ETR indicates to the Map-Server through a Map-Register message that the Map Server should send Map Replies on behalf of the site. The Map Server sends non-authoritative Map Replies for all the EID prefixes contained in the Map Register message. On the Map Server, the `show lisp site site-name` command indicates whether `proxy-reply` is enabled or not.

This command does not require a license.

**Examples**

This example shows how to configure ETR to register to two Map Servers:

```
switch# configure terminal
switch(config)# ipv6 lisp etr map-server 2001:db8:0a::1 key 3 1c275642c17d1e17
switch(config)# ipv6 lisp etr map-server 2001:db8:0b::1 key 3 1c275642c17d1e17
```

This example shows how to configure ETR to register to the Map Server:

```
switch# configure terminal
switch(config)# ipv6 lisp etr map-server 2001:db8:0a::1 key 3 1c275642c17d1e17
switch(config)# ipv6 lisp etr map-server 2001:db8:0a::1 proxy-reply
```

**Related Commands**

Command	Description
<code>ipv6 lisp alt-vrf</code>	Configures which VRF that LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.
<code>ipv6 lisp database-mapping</code>	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
<code>ipv6 lisp etr</code>	Configures the Cisco NX-OS device to act as an IPv6 LISP Egress Tunnel Router (ETR).

Command	Description
lisp site	Configures a LISP site and enters site configuration mode on a Map Server.
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).

# ipv6 lisp hardware-forwarding

To enable hardware-forwarding specifically on the Cisco Nexus 7000 Series device when at least one 32x10GE line card is installed, use the **ipv6 lisp hardware-forwarding** command. To disable this functionality, use the **no** form of this command.

**ipv6 lisp hardware-forwarding**

**no ipv6 lisp hardware-forwarding**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Enabled when at least one 32x10 GE line card is installed.

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** This command is only applicable to the Cisco NX-OS device.

The ip lisp hardware-forwarding command is applicable to the Cisco Nexus 7000 Series device only. Hardware forwarding for LISP is supported on the N7K-M132XP-12 line card only. That is, LISP input and output interfaces must be on the N7K-M132XP-12 line card.



**Caution**

Disabling hardware forwarding should only be used in diagnostic situations. Entering the no ip lisp hardware-forwarding command will cause a full map-cache download to the Cisco NX-OS device hardware.

This command does not require a license.

**Examples** This example shows how to disable the IPv6 LISP hardware forwarding feature:

```
switch# configure terminal
switch(config)# no ipv6 lisp hardware-forwarding
switch(config)# exit
```

**Related Commands**

Command	Description
lisp beta	Enables LISP functionality on the Cisco NX-OS device.



# ipv6 lisp itr

To configure a Cisco NX-OS device to act as an IPv6 Locator/ID Separation Protocol (LISP) Ingress Tunnel Router (ITR), use the **ipv6 lisp itr** command. To remove LISP Ingress Tunnel Router (ITR) functionality, use the **no** form of this command.

**ipv6 lisp itr**

**no ipv6 lisp itr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** When a Cisco NX-OS device is configured as an Ingress Tunnel Router (ITR), if a packet is received for which no IPv6 destination address prefix match exists in the routing table or which matches a default route (you can configure that the source address of the packet matches an IPv4 EID prefix block configured by using the `ipv6 lisp database-mapping` command or `ipv6 lisp map-cache` command. The packet is a candidate for LISP routing. The Ingress Tunnel Router (ITR) looks in the LISP map cache and forwards either the packet, drops the packet, sends a Map Request, or LISP-encapsulates the packet.

If there is no match in the LISP map cache, the Ingress Tunnel Router (ITR) might use one of two methods to obtain an IPv6 EID-to-RLOC mapping. When a Map Resolver is configured when you enter the `ipv6 lisp itr map-resolver` command, the Ingress Tunnel Router (ITR) sends its Map Request in a LISP Encapsulated Control Message (ECM) to the Map-Resolver. When the Ingress Tunnel Router (ITR) is attached to the ALT using the `ipv6 lisp alt-vrf` command, the Ingress Tunnel Router (ITR) sends its Map Request directly on the alternate LISP topology (LISP-ALT). The Ingress Tunnel Router (ITR) caches the IPv4 EID-to-RLOC mapping information returned by the associated Map Reply in its map cache. Subsequent packets destined to the same IPv6 EID prefix block are then LISP-encapsulated according to this IPv4 EID-to-RLOC mapping entry.



**Note** An Ingress Tunnel Router (ITR) can also be configured as an ETR. However, the LISP architecture does not require this requirement.

This command does not require a license.

**Examples**

This example shows how to configure the Ingress Tunnel Router (ITR) functionality on the NX-OS device:

```
switch# configure terminal
switch(config)# ipv6 lisp itr
```

**Related Commands**

Command	Description
ipv6 lisp alt-vrf	Configures the VRF that LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.
ipv6 lisp database-mapping	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
ipv6 lisp itr map-resolver	Configures the IPv4 or IPv6 locator address of the LISP Map Resolver to which the Ingress Tunnel Router (ITR) sends IPv6 Map Request messages
ipv6 lisp map-cache	Configures a static IPv6 EID prefix to locator map-cache entry.

## ipv6 lisp itr map-resolver

To configure the IPv4 or IPv6 locator address of the Locator/ID Separation Protocol (LISP) Map Resolver to be used by the ingress tunnel router (ITR) or Proxy ITR (PITR) when sending Map Requests for IPv4 EID-to-RLOC mapping resolution, use the **ipv6 lisp itr map-resolver** command. To remove the configured locator address of the LISP Map Resolver, use the **no** form of this command.

**ip lispv6 itr map-resolver map-resolver-address**

**no ipv6 lisp itr map-resolver map-resolver-address**

### Syntax Description

map-resolver-address	IPv4 or IPv6 locator addresses of the Map Resolver.
----------------------	---

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Up to two Map Resolvers can be configured per Ingress Tunnel Router (ITR) or PITR within a site for each address family.

When a LISP Ingress Tunnel Router (ITR) or PITR needs to resolve an IPv6 EID-to-RLOC mapping for a destination EID, you can configure it to send a map request either to a Map Resolver by using the `ipv6 lisp itr map-resolver` command or directly over the LISP ALT by using the `ipv6 lisp alt-vrf` command. When a Map Resolver is used, map requests are sent to the Map Resolver with the additional LISP Encapsulated Control Message (ECM) header that includes the Map Resolver RLOC as its destination address. When the ALT is used, map requests are sent directly over the ALT without the additional LISP Encapsulated Control Message (ECM) header, where the destination of the map request is the EID being queried.



#### Note

When you use the `ipv6 lisp itr map-resolver` command, the Ingress Tunnel Router (ITR) or PITR does not run the LISP-ALT. All commands related to the ALT-VRF are ignored (and can be removed).

This command does not require a license.

**Examples**

This example shows how to configure an Ingress Tunnel Router (ITR) to use the Map Resolver located at 2001:DB8:0A::1 when sending its Map-Request messages.

```
switch# configure terminal
switch(config)# ipv6 lisp itr map-resolver 2001:DB8:0A::1
```

**Related Commands**

Command	Description
ipv6 lisp alt-vrf	Configures the VRF that LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.
ipv6 lisp itr	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).
ipv6 lisp map-request-source	Configures the source IPv4 or IPv6 address to be used in IPv6 LISP Map-Request messages.



# ipv6 lisp itr send-data-probe

To configure an ingress tunnel router (ITR) or Proxy ITR (PITR) to find an IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) mapping for a packet it needs to encapsulate by sending a data probe rather than by sending a Map-Request message, use the **ipv6 lisp itr send-data-probe** command. To remove this functionality, use the **no** form of this command.

**ipv6 lisp itr send-data-probe**

**no ipv6 lisp itr send-data-probe**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** When a Locator/ID Separation Protocol (LISP) Ingress Tunnel Router (ITR) or PITR gets a map-cache miss and needs to resolve an IPv4 EID-to-RLOC mapping for a destination EID, you can send a Map-Request message either in a LISP Encapsulate Control Message (ECM) to the Map Resolver by using the `ip lisp itr map-resolver` command or directly over the Locator/ID Separation Protocol Alternative Topology (LISP-ALT) by using the `ip lisp alt-vrf` command. In either case, the first packet of the flow that caused the map-cache miss is dropped. Once the Map Reply populates the map cache, subsequent packets to the same destination are forwarded directly by LISP.



**Note**

When you configure an Ingress Tunnel Router (ITR) or PITR by using the `ip lisp itr send-data-probe` command, you must also configure the Ingress Tunnel Router (ITR) or PITR to use the LISP-ALT by using the `ip lisp alt-vrf` command because the data probe is sent over the LISP-ALT.



**Caution**

We do not recommend that you use the LISP data probe because this mechanism forwards data plane traffic over the LISP-ALT. The LISP-ALT is intended to function solely as a control plane mechanism for LISP and its use subjects it to denial of service attacks.

This command does not require a license.

**Examples**

This example shows how to configure a LISP Ingress Tunnel Router (ITR) to send Data Probes to determine IPv6 EID-to-RLOC mappings:

```
switch# configure terminal
switch(config)# ipv6 lisp itr send-data-probe
```

**Related Commands**

Command	Description
ipv6 lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.
ipv6 lisp itr map-resolver	Configured the IPv4 or IPv6 locator address of the LISP Map-Resolver to which the Ingress Tunnel Router (ITR) sends IPv6 Map Request messages.

## ipv6 lisp itr-etr

To configure a switch to act as both an IPv6 LISP Ingress Tunnel Router (ITR) and Egress Tunnel Router (ETR), use the **ipv6 lisp itr-etr** command. To remove the LISP Ingress Tunnel Router (ITR) functionality, use the **no** form of this command.

**ipv6 lisp itr-etr**

**no ipv6 lisp itr-etr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** Use the `ipv6 lisp itr-etr` command to enable the Cisco NX-OS device to perform both IPv6 LISP Ingress Tunnel Router (ITR) and Egress Tunnel Router (ETR) functionality simultaneously, by using a single command. For usage guidelines for the IPv6 LISP Ingress Tunnel Router (ITR) functionality, see the `ipv6 lisp itr` command. For usage guidelines for the IPv6 LISP ETR functionality, see the `ipv6 lisp etr` command.



**Note** If you use the `ipv6 lisp itr-etr` command and either of the `ipv6 lisp itr` or `ipv6 lisp etr` commands have already been configured, they are automatically removed from the configuration file. When configuring a device as both an Ingress Tunnel Router (ITR) and an ETR, use the command `iv6p lisp itr-etr` to enable both capabilities.

This command does not require a license.

**Examples** This example shows how to configure the IPv6 LISP Ingress Tunnel Router (ITR) and ETR functionality on the NX-OS device:

```
switch# configure terminal
switch(config)# ipv6 lisp itr-etr
```

**Related Commands**

Command	Description
ipv6 lisp etr	Configures the switch to act as an IPv6 LISP Egress Tunnel Router (ETR).
ipv6 lisp itr	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).

## ipv6 lisp locator-down

To configure a locator from a locator set that is associated with an IPv6 endpoint identifier (EID) prefix database-mapping to be unreachable (down), use the `ipv6 lisp locator-down` command. To return the locator to be reachable (up), use the `no` form of this command.

**ipv6 lisp map-cache** *destination-EID-prefix/prefix-length* **locator**

**no ipv6 lisp map-cache** *destination-EID-prefix/prefix-length* **locator**

### Syntax Description

EID-prefix/prefix-length	IPv6 EID prefix and length advertised by this switch.
locator	IPv4 or IPv6 Routing Locator (RLOC) associated with this EID prefix.

### Command Default

An IPv4 or IPv6 locator associated with a configured IPv6 EID prefix block is considered reachable (up) unless an IGP routing protocol indicates it is down.

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When you configure LISP database parameters on an Ingress Tunnel Router (ITR) for specified IPv4 EID prefix blocks by using the `ipv6 lisp database-mapping` command or the `ipv6 lisp map-cache` command, the locators associated with these IPv4 EID prefix blocks are considered as reachable (up) by default. You can use the `ipv6 lisp locator-down` command to configure a locator from a locator-set associated with the EID prefix database mapping to be down.

When you enter the `ipv6 lisp locator-down` command, the Locator Status Bits (LSBs) for the configured locator is cleared when encapsulating packets to remote sites. ETRs at remote sites look for changes in the LSB when decapsulating LISP packets, and when the LSB indicates that a specific locator is down, the ETR refrains from encapsulating packets using this locator to reach the local site.



#### Note

If you enter the `ipv6 lisp locator-down` command on an Ingress Tunnel Router (ITR) to indicate that a locator is unreachable (down) and the LISP site includes multiple Ingress Tunnel Routers (ITRs), you must enter the `ip lisp locator-down` command on all Ingress Tunnel Routers (ITRs) at the site to ensure that the site consistently tells remote sites that the configured locator is not reachable.

This command does not require a license.

**Examples**

This example shows how to configure the locator to a down state for the IPv6 EID prefix block:

```
switch# configure terminal
switch(config)# ipv6 lisp locator-down 2001:DB8:BB::/48 2001:DB8:0A::1
```

**Related Commands**

Command	Description
ipv6 lisp database-mapping	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
ipv6 lisp itr	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).
ipv6 lisp map-cache	Configures a static IPv6 EID prefix to the locator map-cache entry.

## ipv6 lisp locator-vrf

To configure a nondefault virtual routing and forwarding (VRF) table to be referenced by any IPv6 locator addresses, use the **ipv6 lisp locator-vrf** command. To return to using the default routing table for locator address references, use the **no** form of this command.

**ipv6 lisp locator-vrf vrf-name**

**no ipv6 lisp locator-vrf vrf-name**

### Syntax Description

vrf-name	Name of the VRF instance to be referenced by IPv6 locator addresses instead of the default table.
----------	---

### Command Default

IPv6 locator addresses are associated with the default (global) routing table.

### Command Modes

VRF configuration  
network-adminvdc-admin

### Command History

Release	Modification
5.0(3.lisp)	This command was introduced.

### Usage Guidelines

When you configure Locator/ID Separation Protocol (LISP) in a nondefault VRF to keep EID prefixes in one VRF separate from EID prefixes in another VRF, and both EID VRFs share the same locator-based core network and same mapping database system infrastructure, these locator addresses must be reachable from the default VRF or a specified common VRF. Use the **ipv6 lisp locator-vrf** command to specify the VRF to be associated with these locator addresses.

When you enter the **ipv6 lisp locator-vrf** command, the locator addresses in any subsequent LISP commands are referenced to the specified VRF. For example, the locator addresses in the **ipv6 lisp itr map-resolver** and **ipv6 lisp etr map-server** commands refer to the VRF that you configured when you entered the **ip lisp locator-vrf** command. The Map Servers and Map-Resolvers can also share the configuration from the locator VRF.



#### Note

When you configure mixed address families (for example, IPv4 EIDs and IPv6 locators or IPv6 EIDs and IPv4 locators), use the **ipv6 lisp locator-vrf** command.

This command does not require a license.

**Examples**

In the following example, a LISP xTR is configured with three EID contexts red, blue, and green, and the locator VRF default. Red and blue are both using the RLOC of 10.10.10.1 if you enter the `ipv6 lisp locator-vrf default` command. In addition, red and blue both inherit the globally defined map resolver and Map Server located at 10.100.1.1 (configured at the end of this example). Both red and blue have an EID prefix of 172.16.0.0/24, but segmentation is maintained due to the unique LISP instance ID for each VRF context. The green context also uses the RLOC of 10.10.10.1 if you enter the `ipv6 lisp locator-vrf default` command. However, green overrides the inheritance of the globally defined map-resolver and Map-Server by including the ones configured within the VRF context and located at 10.200.1.1. The locator for this locally defined map-resolver or Map-Server remains within the default VRF when you enter the `ipv6 lisp locator-vrf default` command.

```
switch# configure terminal
switch(config)# vrf context red
switch(config-vrf)# ipv6 lisp itr-etr
switch(config-vrf)# ipv6 lisp database-mapping 2001:db8:a::/48 10.10.10.1 priority 1 weight
1
switch(config-vrf)# lisp instance-id 111
switch(config-vrf)# ipv6 lisp locator-vrf default
switch(config-vrf)# exit

switch(config)# vrf context blue
switch(config-vrf)# ipv6 lisp itr-etr
switch(config-vrf)# ipv6 lisp database-mapping 2001:db8:a::/48 10.10.10.1 priority 1 weight
1
switch(config-vrf)# lisp instance-id 222
switch(config-vrf)# ipv6 lisp locator-vrf default
switch(config-vrf)# exit

switch(config)# vrf context green
switch(config-vrf)# ipv6 lisp itr-etr
switch(config-vrf)# ipv6 lisp database-mapping 2001:db8:b::/48 10.10.10.1 priority 1 weight
1
switch(config-vrf)# lisp instance-id 444
switch(config-vrf)# ipv6 lisp locator-vrf default
switch(config-vrf)# ipv6 lisp itr map-resolver 10.200.1.1
switch(config-vrf)# ipv6 lisp etr map-server 10.200.1.1 key 3 xxxxxxxxxxxx
switch(config-vrf)# exit

switch(config)# ipv6 lisp itr map-resolver 10.100.1.1
switch(config)# ipv6 lisp etr map-server 10.100.1.1 key 3 xxxxxxxxxxxx
```

**Related Commands**

Command	Description
<code>ipv6 lisp etr map-server</code>	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv6 EID prefixes
<code>ipv6 lisp itr map-resolver</code>	Configures the locator address of the LISP Map Resolver to which the Ingress Tunnel Router (ITR) sends Map Request messages



## ipv6 lisp map-cache

To configure a static IPv6 endpoint identifier to Routing Locator (EID-to-RLOC) mapping relationship and its associated traffic policy or to statically configure the packet handling behavior associated with a specified destination IPv6 EID prefix, use the **ipv6 lisp map-cache** command. To remove the configuration, use the **no** form of this command.

```

ipv6 lisp map-cache destination-EID-prefix-prefix-length locator priority priority weight weight
no ipv6 lisp map-cache destination-EID-prefix-prefix-length locator priority priority weight weight
ipv6 lisp map-cache destination-EID-prefix/prefix-length {drop|map-request|native-forward}
no ipv6 lisp map-cache destination-EID-prefix/prefix-length {drop|map-request|native-forward}

```

### Syntax Description

destination-EID-prefix	Destination IPv6 EID prefix.
prefix-length	Prefix length.
locator	IPv4 or IPv6 Routing Locator (RLOC) associated with this EID prefix/prefix-length.
priority priority	Specifies the priority (value between 0 and 255) assigned to the RLOC. When multiple locators have the same priority, they may be used in load-sharing. A lower value indicates a higher priority.
weight weight	Specifies the weight (value between 0 and 100) assigned to the locator. This command is used in order to determine how to load-share traffic between multiple locators when the priorities assigned to multiple locators are the same. The value represents the percentage of traffic to be load balanced.
drop	(Optional) Drops packets that match this map-cache entry.
map-request	(Optional) Sends a Map Request for packets.
native-forward	(Optional) Forwards packets natively that match this map-cache entry.

**Command Default** None

**Command Modes** Global configuration mode

**Command History**

Release	Modification
5.0(1.13)	This command was introduced.

**Usage Guidelines**

You can use the `ip lisp map-cache` command to configure an ingress tunnel router (ITR) with a static IPv6 EID-to-RLOC mapping relationship and its associated traffic policy. For each entry, you must enter a destination IPv6 EID prefix block and its associated locator, priority, and weight. The IPv6 EID prefix/prefix-length is the LISP EID prefix block at the destination site. The locator is an IPv6 or IPv6 address of the remote site where the IPv6 EID prefix can be reached. The locator address has a priority and weight that are used to define traffic policies when multiple RLOCs are defined for the same EID prefix block. You can enter this command up to four times for a given EID prefix. Static IPv4 EID-to-RLOC mapping entries configured when you enter the `ip lisp map-cache` command take precedence over dynamic mappings learned through Map-Request/Map-Reply exchanges.

You can also use of the `ipv6 lisp map-cache` command to statically configure the packet handling behavior associated with a specified destination IPv6 EID prefix. For each entry, a destination IPv4 EID prefix block is associated with a configured forwarding behavior. When a packet's destination address matches the EID prefix, one of the following packet handling options:

- **drop**—Packets that match the destination IPv6 EID prefix are dropped. For example, this action may be useful when administrative policies define that packets should be prevented from reaching a site.
- **native-forward**—Packets that match the destination IPv6 EID prefix are natively forwarded without LISP encapsulation. Use this action when the destination site is known to always be reachable natively and LISP encapsulation should never be used.
- **map-request**—Packets that match the destination IPv6 EID prefix cause a Map-Request to be sent. The Map Reply returned by this request allows subsequent packets that match this EID prefix to be Locator/ID Separation Protocol (LISP)-encapsulated. Use this action to troubleshoot map-request activities and other diagnostic actions.

This command does not require a license.

**Examples**

This example shows how to configure a destination EID-to-RLOC mapping and associated traffic policy:

```
switch# configure terminal
switch(config)# ipv6 lisp map-cache 2001:DB8:BB::/48 2001:DB8:0A::1 priority 1 weight 100
```

This example shows how to configure a destination EID-to-RLOC mapping and associated traffic policy to drop:

```
switch# configure terminal
switch(config)# ip lisp map-cache 2001:DB8:AA::/64 drop
```

**Related Commands**

Command	Description
<code>ipv6 lisp database-mapping</code>	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.

Command	Description
ipv6 lisp itr	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).
ipv6 lisp map-cache-limit	Configures the maximum number of IPv6 LISP map-cache entries allowed to be stored by the switch.

## ipv6 lisp map-cache-limit

To configure the maximum number of IPv4 Locator/ID Separation Protocol (LISP) map-cache entries allowed to be stored by the Cisco NX-OS device, use the **ipv6 lisp map-cache-limit** command. To remove the configured map-cache limit, use the **no** form of this command.

**ipv6 lisp map-cache-limit cache-limit [reserve-list list]**

**no ipv6 lisp map-cache-limit cache-limit [reserve-list list]**

### Syntax Description

cache-limit	(Optional) Set of IPv4 EID prefixes in the referenced prefix list for which dynamic map-cache entries shall always be stored.
reserve-list list	(Optional) Specifies the maximum number of IPv4 LISP map-cache entries allowed to be stored on the Cisco NX-OS device. The valid range is from 0 to 10000.

### Command Default

1000

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

Use the `ip lisp map-cache-limit` command to control the maximum number of IPv6 LISP map-cache entries that are allowed to be stored on the Cisco NX-OS device. An optional reserve list can be configured to guarantee that the Cisco NX-OS device always stores the referenced IPv6 EID prefixes.

LISP IPv6 map-cache entries are added in one of two ways: dynamically or statically. Dynamic entries are added when a valid Map-Reply message is returned for a Map-Request message generated in response to a cache-miss lookup. Static entries are added when you enter the `ipv6 lisp map-cache` command.

Dynamic map-cache entries are always added until the default or configured cache limit is reached. After the default or configured cache limit is reached, unless the optional reserve list is configured, no further dynamic entries are added and no further Map Requests are generated in response to cache-miss lookups until a free position is available.

When you do not configure an optional reserve-list keyword, dynamic entries are added on a first-in-first-added basis until the configured map-cache limit is reached. After that time, no new dynamic entries can be added.

If the reserve-list keyword is configured but the prefix list to which it refers is not configured, the results are the same as if the reserve-list keyword was not configured.

When you use the optional reserve-list keyword, a Map Request is generated and a new dynamic map-cache entry can be added only for IPv6 EID prefixes that are permitted by the prefix-list referenced by the reserve-list keyword. The new entry must be able to replace an existing dynamic entry so that the cache limit is maintained. The deleted dynamic entry is either a nonreserve idle map-cache entry or a non-reserve active map-cache entry. Idle map-cache entries are those entries that have seen no activity in the last 10 minutes. If all current dynamic entries are also permitted by the prefix list referenced by the reserve-list, no further dynamic entries can be added.

Existing dynamic IPv6 map-cache entries can time out due to inactivity or can be removed by using the clear ip lisp map-cache command to create a free position in the map cache.

Static map-cache entries are always added, until the default or configured cache limit is reached. After the default or configured cache limit is reached, unless the optional reserve-list is configured, no further static entries are added.

When the optional reserve-list keyword is used, static entries are added on a first-in-first-added basis until the configured map-cache limit is reached. After that time, no new static entries can be added. If you use the reserve-list keyword but you do not configure the prefix list to which it refers, the results are the same as if the reserve-list keyword was not configured.

When you use the optional reserve-list keyword, you can add a prefix list, but only if it can replace an existing static entry or dynamic entry that does not match the reserve list prefix list.



#### Note

When you use the reserve-list command, make sure that the prefix list includes entries that match all expected prefixes in any Map Reply, including the more-specifics. Appending le 128 to the end of all prefix-list entries for IPv6 prefixes. For example, if you want to match 2001:DDB8:BB::/48 and any of the more specifics, you should enter `ipv6 prefix-list lisp-list seq 5 permit 2001:DDB8:BB::/48 le 128` in order to cover all replies within this range.

This command does not require a license.

#### Examples

This example shows how to configure the LISP cache-limit and a reserve-list:

```
switch# configure terminal
switch(config)# ipv6 lisp map-cache-limit 2000 reserve-list LISP-v6-always
switch(config)# ip prefix-list LISP-always seq 10 permit 2001:DB8:BA::/46 le 128
```

#### Related Commands

Command	Description
ipv6 lisp map-cache	Configures a static IPv6 EID prefix to the locator map-cache entry.
clear ipv6 lisp map-cache	Clears the LISP IPv6 map-cache on the local switch.
debug ipv6 lisp mapping control	Displays logs for Map Request, Map-Reply, and other LISP IPv6 mapping activities

## ipv6 lisp map-request-source

To configure an IPv4 or IPv6 address to be used as the source address for Locator/ID Separation Protocol (LISP) IPv6 Map-Request messages, use the **ipv6 lisp map-request-source** command. To remove the configured Map-Request source address and return to the default behavior, use the **no** form of this command.

**ipv6 lisp map-request-source source-address**

**no ipv6 lisp map-request-source source-address**

### Syntax Description

source-address	IPv4 or IPv6 source address to be used in LISP IPv6 Map-Request messages.
----------------	---

### Command Default

The Cisco NX-OS device uses one of the locator addresses that you configure by using the `ipv6 lisp database-mapping` command as the default source address for LISP Map-Request messages.

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

A locator address that you configured by using the `ipv6 lisp database-mapping` command is used as the source address for LISP IPv6 Map-Request messages. There are cases, however, where it might be necessary to configure the specified source address for these Map-Request messages. For example, when the ingress tunnel router (ITR) is behind a Network Address Translation (NAT) device, you might need to specify a source address that matches the NAT configuration to properly allow for return traffic.

When you enter the `ipv6 lisp map-request-source` command on an Ingress Tunnel Router (ITR), the specified IPv4 or IPv6 locator is used by an Ingress Tunnel Router (ITR) as the source address for LISP IPv6 Map Request messages. When you enter the `ipv6 lisp map-request-source` command on a Map Server, this locator is used as the source address in the Encapsulated Control Message that carries a Map Request to an ETR.

This command does not require a license.

### Examples

This example shows how to configure an Ingress Tunnel Router (ITR) to use the source IPv6 address in its IPv6 Map-Request messages:

```
switch# configure terminal
switch(config)# ipv6 lisp map-request-source 2001:DB8:0A::1
```

**Related Commands**

Command	Description
ipv6 lisp database-mapping	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.

## ipv6 lisp map-resolver

To configure a switch to act as an IPv6Locator/ID Separation Protocol (LISP) Map Resolver (MR), use the **ipv6 lisp map-resolver** command. To remove LISP Map-Resolver functionality, use the **no** form of this command.

**ipv6 lisp map-resolver**

**no ipv6 lisp map-resolver**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

A Map Resolver receives a LISP Encapsulated Control Message (ECM) that contains a Map-Request from a LISP Ingress Tunnel Router (ITR) directly over the underlying locator-based network. The Map Resolver decapsulates this message and forwards it on the LISP Alternative Topology (LISP-ALT) topology, where it is delivered either to an ingress tunnel router (ITR) that is directly connected to the LISP-ALT and that is authoritative for the endpoint identifier (EID) being queried by the Map Request or to the Map Server that is injecting EID prefixes into the LISP-ALT on behalf of the authoritative ETR.

Map Resolvers also send Negative Map Replies directly back to an Ingress Tunnel Router (ITR) in response to queries for non-LISP addresses.

When deploying a LISP Map Resolver, follow these guidelines:

- When a Map Resolver is configured to use the LISP ALT for endpoint identifier to Routing Locator (EID-to-RLOC) mapping resolution, the Map-Resolver configuration must include the `ipv6 alt-vrf` command.
- When a Map Resolver is configured concurrently with a Map Server as a stand-alone system (when it is not connected to any ALT and it has full knowledge of the LISP mapping system for a private LISP deployment), using the `ipv6 alt-vrf` command is not required.
- When a Map Resolver supports a LISP deployment that is configured for virtualization, you must concurrently configure the Map Resolver with a Map-Server and see registrations from all ETRs in the LISP network to properly resolve Map-Requests when instance IDs are used. A Map-Resolver cannot forward a Map Request with an instance ID over the LISP ALT, as would be the case in a nonvirtualized configuration. The Map Resolver can only query EID tables that are maintained by the concurrent Map Server for EID-to-RLOC mapping resolution in a virtualized LISP deployment.



This command does not require a license.

### Examples

This example shows how to configure the IPv6 LISP Map-Resolver functionality on the NX-OS device.

```
switch# configure terminal  
switch(config)# ipv6 lisp map-resolver
```

### Related Commands

Command	Description
ipv6 lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.

## ipv6 lisp map-server

To configure a switch to act as an IPv6 Locator/ID Separation Protocol (LISP) Map-Server (MS), use the **ipv6 lisp map-server** command. To remove LISP Map-Server functionality, use the **no** form of this command.

**ipv6 lisp map-server**

**no ipv6 lisp map-server**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

LISP site commands are configured on the Map Server for a LISP egress tunnel router (ETR) that registers to it, including an authentication key, which must match the one also configured on the ETR. A Map Server receives Map-Register control packets from ETRs. When you configure the Map Server with a service interface to the LISP Alternative Topology (LISP-ALT), it injects aggregates for the registered EID prefixes into the LISP-ALT.

The Map Server also receives Map-Request control packets from the LISP-ALT, which it then forwards as a LISP Encapsulated Control Message (ECM) to the registered ETR that is authoritative for the EID prefix being queried. The ETR returns a Map-Reply message directly back to the Ingress Tunnel Router (ITR).

When deploying a LISP Map Resolver, follow these guidelines:

- When a Map-Resolver is configured to use the LISP ALT for endpoint identifier to Routing Locator (EID-to-RLOC) mapping resolution, the Map Resolver configuration must include the `ipv6 alt-vrf` command.
- When a Map Resolver is configured concurrently with a Map Server as a stand-alone system (when it is not connected to any ALT and it has full knowledge of the LISP mapping system for a private LISP deployment), using the `ipv6 alt-vrf` command is not required.
- When a Map Resolver supports a LISP deployment that is configured for virtualization, you must concurrently configure the Map Resolver with a Map Server and see registrations from all ETRs in the LISP network to properly resolve Map Requests when instance IDs are used. A Map Resolver cannot forward a Map Request with an instance ID over the LISP-ALT, as would be the case in a nonvirtualized configuration. The Map Resolver can only query EID-tables that are maintained by the concurrent Map Server for EID-to-RLOC mapping resolution in a virtualized LISP deployment.

This command does not require a license.

### Examples

This example shows how to configure IPv6 LISP Map-Server functionality on the NX-OS device.

```
switch# configure terminal  
switch(config)# ipv6 lisp map-server
```

### Related Commands

Command	Description
<b>ipv6 lisp alt-vrf</b>	Configure which VRF supporting the IPv6 address-family LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.

# ipv6 lisp nat-transversal

To configure an egress tunnel router (ETR) with a private locator that is sited behind a Network Address Translation (NAT) device to dynamically determine its NAT-translated public locator for use in Map-Register and Map-Reply messages, use the **ip lisp nat-transversal** command. To remove this functionality, use the **no** form of this command.

**ipv6 lisp nat-transversal**

**no ipv6 lisp nat-transversal**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Interface configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When an ETR is sited behind a NAT device, its routing locator belongs to the private address space that the NAT device translates to a public globally routed address. The ETR needs to know this public global locator address because this address is required for use in Map-Register and Map-Reply messages.

When you enter the `ip lisp nat-transversal` command is configured, the ETR determines its own public global locator dynamically. When configured, the ETR sends a LISP Echo-Request message to the configured Map Server out the interface under which this command is configured. The Map Server replies with an Echo Reply message that includes the source address from the Echo Request, which is the NAT-Translated public global locator address.

The `ipv6 lisp nat-transversal` command is useful when the dynamic keyword is used with the `ipv6 lisp database-mapping` command in order to dynamically determine the routing locator rather than statically defining it.

This command does not require a license.

## Examples

This example shows how to configure the ETR to dynamically determine its public global routing locator when it is behind a NAT device:

```
switch# configure terminal
switch(config)# interface Ethernet2/0
switch(config-if)# ipv6 lisp nat-transversal
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>ipv6 lisp database-mapping</b>	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
ipv6 lisp etr	Configures the switch to act as an IPv4 LISP Egress Tunnel Router (ETR).

## ipv6 lisp proxy-etr

To configure a switch to act as an IPv6 Locator/ID Separation Protocol (LISP) Proxy Egress Tunnel Router (PETR), use the **ipv6 lisp proxy-etr** command. To remove LISP PETR functionality, use the **no** form of this command.

**ipv6 lisp proxy-etr**

**no ipv6 lisp proxy-etr**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

The Cisco NX-OS device accepts LISP-encapsulated packets from an ingress tunnel router (ITR) or Proxy ITR (PITR) that are destined to non-LISP sites, deencapsulates them, and then forwards them natively toward the non-LISP destination.

PETR services may be necessary in several cases. For example, by default, when a LISP site forwards packets to a non-LISP site natively (not LISP encapsulated), the source IP address of the packet is that of a site EID. If the provider side of the access network is configured with strict unicast reverse path forwarding (uRPF) or an antispoofing access-list, it would consider these packets to be spoofed and drop them because EIDs are not advertised in the provider default free zone (DFZ). Instead of natively forwarding packets destined to non-LISP sites, the Ingress Tunnel Router (ITR) encapsulates these packets using the site locator as the source address and the PETR as the destination address. Packets destined for LISP sites follow normal LISP forwarding processes and are sent directly to the destination ETR.



#### Note

When an Ingress Tunnel Router (ITR) or PITR requires IPv4 PETR services, you must configure Ingress Tunnel Router (ITR) or PITR to forward IPv4 EID packets to the PETR by using the `ip lisp use-petr` command.

This command does not require a license.

**Examples**

This example shows how to configure IPv6 LISP PETR functionality on the NX-OS device:

```
switch# configure terminal  
switch(config)# ipv6 lisp proxy-etr
```

**Related Commands**

Command	Description
ipv6 lisp etr	Configures the switch to act as an IPv6 LISP Egress Tunnel Router (ETR)
ipv6 lisp use-petr	Configures an Ingress Tunnel Router (ITR) or PITR to use the PETR for traffic destined to non-LISP IPv6 destinations.

## ipv6 lisp proxy-itr

To configure a switch to act as an IPv6 Locator/ID Separation Protocol (LISP) Proxy Ingress Tunnel Router (PITR), use the **ipv6 lisp proxy-itr** command. To remove the LISP PITR functionality, use the no form of this command.

**ipv6 lisp proxy-itr ipv6-local-locator [ipv4-local-locator]**

**no ipv6 lisp proxy-itr ipv6-local-locator [ipv4-local-locator]**

### Syntax Description

<b>ipv6-local-locator</b>	IPv6 locator address used as a source address for encapsulation of data packets, a data probe, or a Map-Request message.
<b>ipv4-local-locator</b>	(Optional) IPv4 locator address used as a source address for encapsulation of data packets, a data probe, or a Map-Request message when the locator-hash function returns a destination Routing Locator (RLOC) in the IPv4 address family.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

The Cisco NX-OS device receives native packets from non-LISP sites that are destined for LISP sites, encapsulates them, and forwards them to the ETR that is authoritative for the destination LISP site EID.

PITR services are required to provide interworking between non-LISP sites and LISP sites. For example, when connected to the Internet, a PITR acts as a gateway between the legacy Internet and the LISP-enabled network. The PITR must advertise one or more highly aggregated endpoint identifier (EID) prefixes on behalf of LISP sites into the underlying DFZ (that is the Internet) and act as an Ingress Tunnel Router (ITR) for traffic received from the public Internet.

When you enable PITR services by using the `ipv6 lisp proxy-itr` command, the PITR creates LISP-encapsulated packets when it sends a data packet to a LISP site, sends a data probe, or sends a Map-Request message. The outer (LISP) header address family and source address are determined as follows:

- When the locator-hash function returns a destination Routing Locator (RLOC) within the IPv4 address family, the address `ipv4-local-locator` is used as the source address from the locator namespace.



- When the locator-hash function returns a destination RLOC within the IPv6 address family (assuming the optional address `ipv6-local-locator` is entered), it is used as a source locator for encapsulation.

When you configure a switch to function as an IPv4 Pitr, you can also configure it to use the LISP-ALT for IPv4 EID-to-RLOC mapping resolution. When configured to use the LISP-ALT, the Pitr sends its map request messages directly over the LISP ALT using the virtual routing and forwarding (VRF) when you enter the `ipv6 lisp alt-vrf` command. A Pitr can send a Map Request to a configured Map Resolver for EID-to-RLOC mapping resolution as an alternative to sending a Map Request directly over the LISP-ALT. (See the `ipv6 map-resolver` command) When using a Pitr in a virtualized LISP deployment, you must configure the Pitr to use a Map-Resolver for EID-to-RLOC mapping resolution and not the LISP-ALT because the LISP-ALT does not support virtualization.

**Note**

A switch that is configured as an Ingress Tunnel Router (ITR) performs a check to see if the source of any packet intended for LISP encapsulation is within the address range of a local EID prefix. A Cisco NX-OS device configured as a Pitr does not perform this check. Unlike the Cisco IOS LISP implementation, in Cisco NX-OS you can configure a Cisco NX-OS device to support both Ingress Tunnel Router (ITR) and Pitr functionality at the same time. If you configure a Cisco NX-OS device as an Ingress Tunnel Router (ITR) and as a Pitr, preference goes to Pitr functionality for packet processing.

This command does not require a license.

**Examples**

This example shows how to configure the LISP Pitr functionality on the NX-OS device and to encapsulate packets using a source locator:

```
switch# configure terminal
switch(config)# ipv6 lisp proxy-itr 2001:db8:bb::1
```

**Related Commands**

Command	Description
<code>ipv6 lisp alt-vrf</code>	Configures which VRF supporting the IPv6 address-family LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.
<code>ipv6 lisp itr</code>	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).

## ipv6 lisp shortest-eid-prefix-length

To configure the shortest IPv6 endpoint identifier (EID)-prefix mask length that is acceptable to an ingress tunnel router (ITR) or Proxy ITR (PITR) in a received Map-Reply message or to an ETR in the mapping-data record of a received Map Request, use the **ipv6 lisp shortest-eid-prefix-length** command. To return to the default configuration, use the no form of this command.

**ipv6 lisp shortest-eid-prefix-length IPv6-EID-prefix-length**

**no ipv6 lisp shortest-eid-prefix-length IPv6-EID-prefix-length**

### Syntax Description

IPv6-EID-prefix-length	Shortest IPv6 EID prefix-length accepted from a Map Reply or data record in a Map Request. The range is from 0 to 128.
------------------------	--

### Command Default

48

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When an Ingress Tunnel Router (ITR) or PITR receives a Map Reply message, the mapping data it contains includes the EID mask-length for the returned EID prefix. By default, the shortest EID prefix mask length accepted by an Ingress Tunnel Router (ITR) or PITR for an IPv4 EID prefix is a /48.

You can use the `ipv6 lisp shortest-eid-prefix-length` command to change this default. For example, it might be necessary for a PITR to accept a shorter (coarser) prefix if one exists.

When an ETR receives a Map-Request message, it might contain a mapping data record that the ETR can cache and possibly use to forward traffic depending on the configuration of the `ipv6 lisp etr accept-map-request-mapping` command.

Use the `ipv6 lisp shortest-eid-prefix-length` command to change the shortest prefix length accepted by the ETR. In this case, the check for the shortest EID prefix mask length is done prior to the verifying Map Request, if also configured. If the EID prefix mask length is less than the configured value, the verifying Map Request is not sent and the mapping data is not accepted.

### Examples

This example shows how to configure the NX-OS device to accept a minimum IPv6 EID prefix length:

```
switch# configure terminal
switch(config)# ipv6 lisp shortest-eid-prefix-length 40
```

**Related Commands**

<b>Command</b>	<b>Description</b>
ipv6 lisp etr	Configures the switch to act as an IPv6 LISP Egress Tunnel Router (ETR).
ipv6 lisp itr	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).
ipv6 lisp proxy-itr	Configures the switch to act as an IPv6 LISP Proxy Ingress Tunnel Router (PITR).

## ipv6 lisp source-locator

To configure a source locator to be used for IPv6 Locator/ID Separation Protocol (LISP)-encapsulated packets, use the **ipv6 lisp source-locator** command. To remove the configured source locator, use the **no** form of this command.

**ipv6 lisp source-locator interface**

**no ipv6 lisp source-locator interface**

### Syntax Description

interface	Name of the interface whose IPv6 address should be used as the source locator address for outbound LISP-encapsulated packets.
-----------	---

### Command Default

The IPv6 address of the outbound interface is used by default as the source locator address for outbound LISP-encapsulated packets.

### Command Modes

Interface configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When sending a LISP-encapsulated packet (data or control message), the Cisco NX-OS device performs a destination lookup to determine the appropriate outgoing interface. By default, the IPv6 address of this outgoing interface is used as the source locator for the outbound LISP-encapsulated packet.

You might need to use the IPv6 address of a different interface as the source locator for the outbound LISP encapsulated packets rather than that of the outgoing interface. For example, when an Ingress Tunnel Router (ITR) has multiple egress interfaces, you might configure a loopback interface for stability purposes and instruct the Ingress Tunnel Router (ITR) to use the address of this loopback interface as the source locator for the outbound LISP-encapsulated packets rather than one or both of the physical interface addresses. This command `ipv6 lisp source-locator` is also important for maintaining locator consistency between the two LISP Tunnel Routers (xTRs) when RLOC-probing is used.

This command does not require a license.

### Examples

This example shows how to configure the source locator when sending LISP encapsulated packets:

```
switch# configuration terminal
switch(config)# interface Ethernet 2/0
switch(config-if)# ipv6 lisp source-locator Loopback0
```

```
switch(config-if)# interface Ethernet2/1
switch(config-if)# ipv6 lisp source-locator Loopback0
```

**Related Commands**

Command	Description
ipv6 lisp itr	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).

## ipv6 lisp translate

To configure IPv6 Locator/ID Separation Protocol (LISP) translation mapping, use the **ipv6 lisp translate** command. To remove IPv6 LISP translation mappings and return to the default value, use the no form of this command.

**ipv6 lisp translate inside IPv6-inside-EID outside IPv6-outside-EID**

**no ipv6 lisp translate inside IPv6-inside-EID outside IPv6-outside-EID**

### Syntax Description

<b>inside</b>	Indicates that the inside (nonroutable) IPv6 endpoint identifier (EID) prefix follows.
<b>IPv6-inside-EID</b>	Nonroutable IPv6 address associated with an inside EID prefix.
<b>outside</b>	Indicates that the outside (routable) IPv6 EID prefix follows.
<b>IPv6-outside-EID</b>	Routable IPv6 address associated with an outside EID prefix.

### Command Default

None

### Command Modes

Global configuration mode  
network-adminvdc-admin

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When you configure a LISP Ingress Tunnel Router (ITR) or Egress Tunnel Router (ETR) with a nonroutable EID prefix and you want to replace it with a routable EID prefix, use the `ipv6 lisp translate` command. A LISP device that acts as an Ingress Tunnel Router (ITR) and detects a nonroutable EID in the source IPv4 address field replaces it with the routable EID when you use the `inside` and `outside` keyword. In the opposite direction when acting as an ETR, it replaces the routable EID referred to by the `outside` keyword with the no-routable EID referred to by the `inside` keyword.

**Note**

The outside EID address can be assigned to the Cisco NX-OS device itself, in which case it responds to Address Resolution Protocol (ARP) requests, ICMP echo-requests (ping) and any other packet sent to this address. When you do not assign the outside EID to the device, the address does not answer ARP requests.

This feature may be useful if you want to upgrade but you want to continue to communicate with non-LISP sites. An alternative approach for providing communications between LISP and non-LISP sites is to use Proxy-ITR services. See the `ipv6 lisp proxy-itr` command for further details. Both proxy-ITR and NAT translation services, also referred to as Interworking services, are described in draft-ietf-lisp-interworking-00.

This command does not require a license.

**Examples**

This example shows how to configure LISP to translate the inside address to the outside address:

```
switch# configuration terminal
switch(config)# ipv6 lisp translate inside 2001:db8:aa::1 outside 2001:db8:bb::1
```

**Related Commands**

Command	Description
<code>ipv6 lisp etr</code>	Configures the switch to act as an IPv6 LISP Egress Tunnel Router (ETR).
<code>ipv6 lisp itr</code>	Configures the switch to act as an IPv6 LISP Ingress Tunnel Router (ITR).
<code>ipv6 lisp proxy-itr</code>	Configures the switch to act as an IPv6 LISP Proxy Ingress Tunnel Router (PITR).

## ipv6 lisp use-petr

To configure a switch to use an IPv6 Locator/ID Separation Protocol (LISP) Proxy Egress Tunnel Router (PETR), use the **ipv6 lisp use-petr** command. To remove the use of a LISP PETR, use the **no** form of this command.

**ipv6 lisp use-petr locator-address**

**no ipv6 lisp use-petr locator-address**

### Syntax Description

locator-address	IPv4 or IPv6 locator address of the PETR.
-----------------	---

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When the use of PETR services is enabled, instead of natively forwarding packets destined to non-LISP sites, these packets are LISP-encapsulated and forwarded to the PETR, where these packets are then deencapsulated and forwarded natively toward the non-LISP destination. An Ingress Tunnel Router (ITR) or PITR can be configured to use PETR services.

PETR services might be necessary in several cases. By default, when a LISP site forwards packets to a non-LISP site natively (not LISP encapsulated), the source IP address of the packet is that of a site endpoint identifier (EID). If the provider side of the access network is configured with strict unicast reverse path forwarding (uRPF), it considers these packets to be spoofed and drops them because EIDs are not advertised in the provider default free zone (DFZ). In this case, instead of natively forwarding packets destined to non-LISP sites, the Ingress Tunnel Router (ITR) encapsulates these packets using the site locator as the source address and the PETR as the destination address. Packets destined for LISP sites follow normal LISP forwarding processes and are sent directly to the destination ETR.



#### Note

Because LISP supports mixed protocol encapsulations, the locator specified for the PETR can either be an IPv4 or IPv6 address. Up to eight PETRs can be configured per address family.

This command does not require a license.

### Examples

This example shows how to configure an Ingress Tunnel Router (ITR) to use the PETR with the IPv6 locator:



**Note**

This example assumes that the PETR supports dual-stack connectivity.

```
switch# configuration terminal  
switch(config)# ipv6 lisp use-petr 10.1.1.1
```

**Related Commands**

Command	Description
<b>ipv6 lisp proxy-etr</b>	Configures the switch to act as an IPv6 LISP Proxy Egress Tunnel Router (PETR).

# ipv6 route

To configure a default route to the upstream next hop for all IPv6 destinations, use the **ipv6 route** command. To remove the default route to the upstream next hop for all IPv6 destinations, use the **no** form of this command.

**ipv6 route** *ipv6-prefix next-hop*

**no ipv6 route** *ipv6-prefix next-hop*

## Syntax Description

ipv6-prefix	IPv6 prefix format: xxxx:xxxx/ml, xxxx:xxxx::/ml, xxxx::xx/128.
next-hop	Link local next hop interface. IPv6 address format: aaaa:bbb:cccc:ddd:eee:fff:ggg:hhh, aaa::bbb.

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
6.2(2)	This command was introduced.

## Usage Guidelines

Adding an IPv6 default route to Null0 ensures that all IPv6 packets are handled by LISP processing. (Use of the static route to Null0 is not strictly required, but is recommended as a LISP best practice). If the destination is another LISP site, packets are LISP-encapsulated (using IPv4 RLOCs) to the remote site. If the destination is non-LISP, all IPv6 EIDs are LISP-encapsulated to a PETR (assuming one is configured).

This command does not require a license.

## Examples

This example shows how to configure a default route to the upstream next hop for all IPv6 destinations:

```
switch# configuration terminal
switch(config)# ipv6 route ::/0 null0
switch(config)#
```

**Related Commands**

Command	Description
<b>ipv6 lisp proxy-etr</b>	Configures the switch to act as an IPv6 LISP Proxy Egress Tunnel Router (PETR).





## L Commands

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- [lig](#), page 152
- [lisp beta](#), page 155
- [lisp ddt](#), page 157
- [lisp ddt authoritative-prefix](#), page 158
- [lisp ddt map-server-peer](#), page 160
- [lisp ddt root](#), page 161
- [lisp dynamic-eid](#), page 163
- [lisp extended-subnet-mode](#), page 165
- [lisp instance id](#), page 167
- [lisp loc-reach-algorithm](#), page 169
- [lisp locator-set](#), page 172
- [lisp map-request itr-rlocs](#), page 174
- [lisp mobility](#), page 176
- [lisp site](#), page 178

# lig

To initiate a LISP Internet Groper (LIG) operation for a destination endpoint identifier (EID) or to test the router's local EID prefix, use the **lig** command.

**lig** { **hostname** | **destination-EID** } [ **count count** ] [ **source source-EID** ] [ **to map-resolver** ]

**lig** { **self** | **self6** | **version** } [ **count count** ] [ **source source-EID** ] [ **to map-resolver** ]

## Syntax Description

hostname	Destination hostname.
destination-EID	Destination IPv4 or IPv6 EID.
count count	(Optional) Specifies to send this number of Map Requests. The range is from 1 to 5.
source source-EID	(Optional) Specifies to send the Map Request using this IPv4 or IPv6 source EID.
to map-resolver	(Optional) Specifies to send the Map Request to this map-resolver locator instead of the configured Map-Resolver.
self	Tests to see if the local IPv4 EID prefix is registered in the mapping database.
self6	Test to see if the local IPv6 EID prefix is registered in the mapping database.
version	Displays the version of LIG that the system is supporting.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

**Usage Guidelines**

Use the `lig` command to test whether a destination EID exists in the LISP mapping database system, or to see if your site is registered with the mapping database system.

When a LIG query is initiated with a hostname or destination EID, the router sends a Map Request to the configured Map Resolver for the indicated destination hostname or EID. When a Map Reply is returned, its contents are displayed and entered in the LISP map cache.

When a LIG self query is initiated, the router's local EID prefix is substituted in place of the destination EID when the router sends a Map Request to the configured Map Resolver.

The following operational attributes apply to LIG:

- By default, a minimum of one Map Request is sent to the Map Resolver but up to three Map Requests might be sent to the Map Resolver. Once a Map Reply is returned for a Map Request, no further Map Requests are sent. When you apply the `count` option, a specified number of Map Requests is sent.
- By default, the source of the Map Request is the first configured EID prefix for the site (with the host-bit set to zero). For example, if the local EID prefix is 153.16.21.0/24, the source EID is 153.16.21.0 for the Map Request. When the `source` option is applied, a specific source EID might be used. However, the source EID must be one of the EID addresses assigned to the LISP router.
- When the `lig` command is used with the `self` option, the destination IPv4 EID is also the first configured EID prefix for the site (with the host bit set to zero). For example, if the local IPv4 EID prefix is 153.16.21.0/24, the destination EID is 153.16.21.0 for the Map Request. Use the `self6` option for IPv6 addresses.
- By default, when you enter the `lig` command, the Map-Request is sent to the configured Map Resolver. However, the `to` option can be specified to cause the Map Request to be forwarded to a specified Map Resolver instead you can send a Map Request to a different Map-Resolver can be useful to test that your EID prefix has been properly injected into the ALT infrastructure. In this case, the LIG Map Request is processed by the specified Map Resolver and propagated through each ALT router hop to the Map Server that you have registered to. The Map Server returns the Map Request to your site. Your site generates a Map-Reply to the source of the Map Request (which could be itself or a different LISP Tunnel Router (xTR) within your LISP site).

This command does not require a license.

**Examples**

This example shows how to initiate a LIG operation for a destination EID or to test the router's local EID prefix:

```
switch# lig self
Send loopback map-request to 128.223.156.35 for 153.16.12.0 ...
Received map-reply from 128.223.156.23 with rtt 0.002770 secs
Map-cache entry for EID 153.16.12.0:
153.16.12.0/24, uptime: 00:00:02, expires: 23:59:57, via map-reply, self
  Locator      Uptime      State      Priority/  Data      Control
              Uptime      State      Weight    in/out    in/out
128.223.156.23 00:00:02   up         1/100     0/0      0/0
```

This example shows how to display the local IPv6 EID prefix that is registered in the mapping database:

```
switch# lig self6
Send loopback map-request to 128.223.156.35 for 2610:d0:1203:: ...
Received map-reply from 128.223.156.23 with rtt 0.001148 secs
Map-cache entry for EID 2610:d0:1203:::
2610:d0:1203::/48, uptime: 00:00:02, expires: 23:59:57, via map-reply, self
  Locator      Uptime      State      Priority/  Data      Control
```

```

      128.223.156.23 00:00:02 up          Weight  in/out  in/out
switch#          1/100    0/0    0/0

```

This example shows how to display all LISP map-cache entries, and then uses lig to test for the remote IPv6 EID prefix:

```

switch# show ipv6 lisp map-cache
LISP IPv6 Mapping Cache for VRF "default", 0 entries

```

This example show to to configure LIG to test for the remote IPv6 EID prefix:

```

switch# lig 2610:d0:210f::1
end map-request to 128.223.156.35 for 2610:d0:210f::1 ...
Received map-reply from 85.184.2.10 with rtt 0.204710 secs
Map-cache entry for EID 2610:d0:210f::1:
2610:d0:210f::/48, uptime: 00:00:01, expires: 23:59:58, via map-reply, auth
  Locator      Uptime      State      Priority/  Data      Control
                Weight      in/out    in/out
  85.184.2.10  00:00:01   up         0/100     0/0       0/0
  2001:6e0:4:2::2 00:00:01   up         0/100     0/0       0/0

```

This example shows how to display all IPv6 LISP map-cache entries:

```

switch# show ipv6 lisp map-cache
LISP IPv6 Mapping Cache for VRF "default", 1 entries
2610:d0:210f::/48, uptime: 00:01:25, expires: 23:58:34, via map-reply, auth
  Locator      Uptime      State      Priority/  Data      Control
                Weight      in/out    in/out
  85.184.2.10  00:01:25   up         0/100     0/0       0/0
  2001:6e0:4:2::2 00:01:25   up         0/100     0/0       0/0
switch#

```

This example shows how to display the version of LIG being used by the system:

```

switch# lig version
http://tools.ietf.org/html/draft-ietf-lisp-05
http://tools.ietf.org/html/draft-farinacci-lisp-lig-01

```

## Related Commands

Command	Description
show ip lisp map-cache	Displays the current dynamic and static IPv4 EID-to-RLOC map-cache entries.
show ipv6 lisp map-cache	Displays the current dynamic and static IPv6 EID-to-RLOC map-cache entries.



# lisp beta

To enable Locator/ID Separation Protocol (LISP) to run on the Cisco NX-OS device, use the **lisp beta** command. To disable this functionality, use the **no** form of this command.

**lisp beta**

**no lisp beta**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	5.2(1)	This command was deprecated.
	5.0(1.13)	This command was introduced.

**Usage Guidelines** The lisp beta command is only applicable to the Cisco NX-OS device.

In order to run LISP on the Cisco Nexus 7000 Series device, the functionality must be enabled by using the lisp beta command. When enabled, hardware forwarding of LISP packets is automatically enabled, assuming that at least one 32x10GE line card is installed. Hardware forwarding is the default mode of operation when LISP is enabled.



**Caution**

You can disable hardware forwarding by using the no ip lisp hardware-forwarding command. However, we strongly recommend that you do not do so. Its use is intended for diagnostic functions only.

Additional caveats and requirements apply when LISP is configured on the Cisco NX-OS device only.

In order for LISP to operate, you must configure at least one tunnel interface (or any type) on the system. If no tunnel interface is configured, you must configure an arbitrary (unused) tunnel interface. The only requirements for the tunnel is that the source be active or up and that the destination be reachable, usually by matching a default route to exit the switch or by using a loopback interface that is not in a shutdown state. An example is as follows:

```
interface Tunnel101
  tunnel source Ethernet10/9
  tunnel destination 10.1.1.1
  no shutdown
```

This command does not require a license.

**Examples**

This example shows how to enable LISP on the Cisco Nexus 7000 Series device:

```
switch# configure terminal  
switch(config)# lisp beta
```

**Related Commands**

Command	Description
ip lisp hardware-forwarding	Enables IPv4 LISP hardware-forwarding on the Cisco NX-OS device.
ipv6 lisp hardware-forwarding	Enables IPv6 LISP hardware-forwarding on the Cisco NX-OS device.

# lisp ddt

To configure a switch to perform LISP Delegated Database Tree (DDT) functionality, use the **lisp ddt** command. To remove the LISP DDT mapping, use the **no** form of this command.

**lisp ddt**

**no lisp ddt**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Global configuration mode

Command History	Release	Modification
	6.2(2)	This command was introduced.

**Usage Guidelines** This command does not require a license.

**Examples** This example shows how to configure a LISP DDT mapping:

```
switch# configure terminal
switch(config)# lisp ddt
switch(config)#
```

**Related Commands**

Command	Description
<b>lisp mobility</b>	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).

## lisp ddt authoritative-prefix

To configure a Locator ID/Separation Protocol (LISP) Delegated Database Tree (DDT) node to be authoritative for a specified endpoint identifier (EID) prefix, use the **lisp ddt authoritative-prefix** command. To remove the LISP DDT node to be authoritative for a specified EID prefix, use the **no** form of this command.

**lisp ddt authoritative-prefix** {eid-prefix eid-prefix| instance-id id}

**no lisp ddt authoritative-prefix** {eid-prefix eid-prefix| instance-id id}

### Syntax Description

eid-prefix	Specifies the authoritative IPv4 or IPv6 EID prefix.
eid-prefix	EID prefix in IPv4 and IPv6 slash format.
instance-id	Specifies the instance ID of VPN for EID prefix.
id	Instance ID range in X and Y format where $y > x$ . The range is from 0 to 2147483647.

### Command Default

None

### Command Modes

Global configuration mode

### Command History

Release	Modification
6.2(2)	This command was introduced.

### Usage Guidelines

This command does not require a license.

### Examples

This example shows how to configure a LISP DDT node to be authoritative for a specified EID prefix:

```
switch# configure terminal
Switch(config)# lisp ddt authoritative-prefix eid-prefix 172.16.0.0/16
switch(config)#
```

### Related Commands

Command	Description
<b>lisp mobility</b>	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).



## lisp ddt map-server-peer

To configure a Delegated Database Tree (DDT) enabled Map Server, the locator and endpoint identifier EID prefix (and/or instance ID) for a Map Server peer within the Locator ID-Separation Protocol (LISP) DDT delegation hierarchy, use the **lisp ddt map-server-peer** command. To remove the other Map Server peers, use the **no** form of this command.

**lisp ddt map-server-peer map-server-locator {eid-prefix eid-prefix| instance-id id}**

**no lisp ddt map-server-peer map-server-locator {eid-prefix eid-prefix| instance-id id}**

### Syntax Description

map-server-locator	IPv4 or IPv6 locator address of the DDT node.
eid-prefix	Specifies the child delegation for the IPv4 or IPv6 EID prefix.
eid-prefix	EID prefix in IPv4 or IPv6 slash format.
instance-id	Specifies the instance ID of VPN for the EID prefix.
id	Instance ID range in X and Y format where $y > x$ . The range is from 0 to 2147483647.

### Command Modes

Global configuration mode

### Command History

Release	Modification
6.2(2)	This command was introduced.

### Usage Guidelines

This command does not require a license.

### Examples

This example shows how to configure a LISP DDT Map Server that is configured as authoritative for the IPv6 EID prefix 2001:db8:eeee::/48 for its own locator 10.1.1.1:

```
switch# configure terminal
Switch(config)# lisp ddt map-server-peer 10.1.1.1 eid-prefix 2001:db8:eeee::/48
switch(config)#
```

## lisp ddt root

To configure an IPv4 or IPv6 locator for a Delegated Database Tree (DDT) root node within the delegation hierarchy on a DT-enabled Map Resolver, use the **lisp ddt root** command. To remove the IPv4 or IPv6 locator for a DDT root node within the delegation hierarchy on a DT-enabled Map Resolver, use the **no** form of this command.

**lisp ddt root** *root-locator* [**public-key** *number*]

**no lisp ddt root** *root-locator* [**public-key** *number*]

### Syntax Description

root-locator	IPv6 or IPv4 locator address of DDT root.
public-key	(Optional) Specifies the DDT root's public key used to verify signed Map Referrals.
number	(Optional) 0 specifies an UNENCRYPTED rsa public key. 3 specifies an 3DES ENCRYPTED RSA public key. 7 specifies a Cisco type 7 ENCRYPTED RSA public key. LINE specifies the UNENCRYPTED (cleartext) RSA public key.

### Command Modes

Global configuration mode

### Command History

Release	Modification
6.2(2)	This command was introduced.

### Usage Guidelines

This command does not require a license.

### Examples

This example shows how to configure an IPv4 or IPv6 locator for a DDT root node within the delegation hierarchy on a DT enabled Map Resolver:

```
switch# configure terminal
Switch(config)# lisp ddt root 10.1.1.1 eid-prefix 172.16.0.0/16
switch(config)#
```

**Related Commands**

Command	Description
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).



# lisp dynamic-eid

To configure a Locator ID/Separation Protocol (LISP) Virtual Machine (VM) Mobility (dynamic-EID roaming) policy and enter dynamic-EID configuration mode on an xTR, use the `lisp dynamic-eid` command. To remove the LISP dynamic-EID policy, use the `no` form of this command.

**lisp dynamic-eid dynamic-EID-policy-name**

**no lisp dynamic-eid dynamic-EID-policy-name**

## Syntax Description

dynamic-EID-policy-name	Name of the LISP dynamic-EID policy.
-------------------------	--------------------------------------

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

To configure LISP VM Mobility, you must create a dynamic-EID roaming policy that can be referenced by the `lisp mobility dynamic-eid-policy-name` command. When you enter the `lisp dynamic-eid dynamic-EID-policy-name` command, the referenced LISP dynamic-EID policy is created and you are placed in the dynamic-EID configuration mode. In this mode, you can enter all attributes associated with the referenced LISP dynamic-EID policy.



### Note

In this release of LISP VM Mobility, the following caveats apply: When a dynamic EID is roaming across subnets, you must configure it with a /32 IP address and an interface route to the default switch. For example, for a Linux or UNIX host, the following configuration is used:  
`ifconfig eth0 eid-address netmask 255.255.255.255`  
`route add default any-switch-address`  
 When a dynamic-EID is roaming across subnets, you must configure it with a /32 IP address and an interface route to the default switch. For example, for a Linux or UNIX host, the following configuration will be used:  
`ifconfig eth0 eid-address netmask 255.255.255.255`  
`route add default any-switch-address`  
`arp -s any-switch-address 00:00:0e:1d:01:0c`  
 All LISP VM-router interfaces (the interface the dynamic EID will roam to) must have the same MAC address. You can configure interfaces by using the `mac-address 0000.0e1d.010c` command.

**Note**

This feature is available for both IPv4 and IPv6. However, this feature is tested for IPv4 only. In addition, while necessary Address Resolution Protocol (ARP) changes have been made for IPv4, similar changes required for Neighbor Discover (ND) for IPv6 have not been implemented.

This command does not require a license.

**Examples**

This example shows how to configure the LISP dynamic-EID policy named Roamer-1 and enter dynamic-EID configuration mode:

```
switch# configure terminal
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)#
```

**Related Commands**

Command	Description
<b>lisp mobility</b>	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).

# lisp extended-subnet-mode

To configure an interface to create a dynamic-endpoint identifier (EID) state for hosts attached on their own subnet in order to track the movement of EIDs from one part of the subnet to another part of the same subnet, use the `lisp extend-subnet-mode` command. To remove this functionality, use the `no` form of this command.

**lisp extended-subnet-mode**

**no lisp extended-subnet-mod**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Disabled

**Command Modes** Interface configuration mode

Command History	Release	Modification
	5.0(3)	This command was introduced.

**Usage Guidelines** Use the `lisp extended-subnet-mode` command when a subnet is extended across a Layer 3 cloud where Layer 2 connectivity is maintained by a mechanism other than the Locator Separation Protocol (LISP) (for example, Overlay Transport Virtualization (OTV) or Virtual Private LAN Services (VPLS)). Use the `lisp extended-subnet-mode` command to enable the dynamic-EID state to create host attached on their own subnet so that the remote Ingress Tunnel Routers (ITRs) and Proxy ITRs (PITRs) can track the movement of EIDs from one part of its subnet to another part of the same subnet.



**Note** When you enter the `lisp extended-subnet-mode` command on an interface, any dynamic-EID prefixes configured by using the `lisp mobility` commands on the same interface must have more specific prefixes than any overlapping subnet prefixes. For example, if `lisp extended-subnet-mode` is configured on an interface that has a base subnet of a /24, when you enter the `lisp mobility dyn-eid-name` command, the EID prefix for the dynamic EID `dyn-eid-name` must be /25 or greater.

This command does not require a license.

**Examples** This example shows how to configure an interface to create a dynamic EID state for hosts attached on their own subnet:

```
switch# configure terminal
switch(config)# interface Ethernet 2/0
switch(config-if)# lisp extended-subnet-mode
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map Server.
lisp dynamic-eid	Configures the LISP dynamic-EID roaming policy.
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP Virtual Machine (VM) mobility (dynamic-EID roaming).

# lisp instance id

To configure an instance ID to be associated with endpoint identifier (EID)-prefixes for a Locator/ID Separation Protocol (LISP) Tunnel Router (xTR), use the `lisp instance-id` command. To disable this functionality, use the `no` form of this command.

**lisp instance-id iid**

**no lisp instance-id iid**

## Syntax Description

<b>iid</b>	Instance ID for this xTR. The range is from 1 to 16777215.
------------	--

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

Virtualization support is currently available in LISP xTRs and the Map Server (MS) and Map Resolver (MR). The instance ID has been added to LISP to support virtualization.

Only one instance ID can be configured per EID virtual routing and forwarding (VRF) context. When an instance ID is configured, this instance ID is included with the EID prefixes when they are registered with the Map Server. The Map Server must also include the same instance ID within the EID prefix configurations for this LISP site. You can configure instance IDs on the MS by using the `eid-prefix` command in the `lisp site` command mode.



### Note

Virtualization support is not currently available for the LISP Alternate Topology (ALT), which means that it is also not supported on LISP Proxy Ingress Tunnel Routers (PITRs).

This command does not require a license.

## Examples

This example shows how to configure an instance ID on this xTR:

```
switch# configure terminal
switch(config)# lisp xtr instance-id 123
```

lisp instance id

**Related Commands**

Command	Description
eid-prefix	Configures a list of EID prefixes that are allowed in a Map Register message sent by an ETR when registering to the Map Server.

# lisp loc-reach-algorithm

To configure a Locator/ID Separation Protocol (LISP) locator reachability algorithm, use the **lisp loc-reach-algorithm** command. To disable this functionality, use the **no** form of this command.

**lisp loc-reach-algorithm** {count-tcp| echo-nonce| rloc-probing}

**no lisp loc-reach-algorithm** {count-tcp| echo-nonce| rloc-probing}

## Syntax Description

count-tcp	Enables the tcp-count locator reachability algorithm.
echo-nonce	Enables the echo-nonce locator reachability algorithm.
rloc-probing	Enables the rloc-probing locator reachability algorithm.

## Command Default

Disabled

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When a LISP site communicates with a remote LISP site, it maintains endpoint identifier-to-Routing Locator (EID-to-RLOC) mapping information in its local map cache. In order for a LISP site to maintain an accurate status of locators at remote LISP sites with which it is communicating, the LISP Tunnel Router (xTR) can be configured to use three different locator reachability algorithms: tcp-count, echo-nonce, and rloc-probing. Certain algorithms can only be enabled on certain devices.

The following locator reachability algorithms and their descriptions are as follows:

- The tcp-count algorithm is most useful when the traffic between the sites is asymmetric (but also works for symmetric traffic patterns). The count-tcp algorithm can only be enabled on Ingress Tunnel Router (ITR) and Proxy ITR (PITR) devices. An Egress Tunnel Router (ETR) does not need to participate. The count-tcp algorithm is particularly useful in PITRs because encapsulated traffic is not returned to a PITR. When count-tcp is configured, an Ingress Tunnel Router (ITR) counts SYN and ACK TCP packets per locator to which it encapsulates packets. Over a 1-minute period, if SYNs-seen are non zero and ACKs-seen are zero, the Ingress Tunnel Router (ITR) assumes the locator is no longer reachable. The locator is marked to the down status and a switchover is made to another locator if one is available. After 3 minutes, the locator is brought back up and counting resumes.

- The echo-nonce algorithm works only when traffic is flowing in both directions between locators. You must enable the echo-nonce algorithm on both an Ingress Tunnel Router (ITR) and ETR to have it operate correctly. You must not use the echo-nonce algorithm on a PITR because the echo-nonce algorithm requires bidirectional traffic flows between locators and encapsulated traffic is not returned to the PITR. When you configure echo-nonce, every 1 minute, an Ingress Tunnel Router (ITR) requests that the nonce it is using in encapsulated packets be echoed back from the locator it is using. If data is still arriving from the locator but the nonce is not being echoed, the Ingress Tunnel Router (ITR) assumes that the forward path is unreachable. The locator is marked to the down status and a switchover is made to another locator if one is available. After 3 minutes and if data is arriving from the locator, the Ingress Tunnel Router (ITR) marks the locator up and starts sending nonce requests again.
- The rloc-probing algorithm works in most environments. The rloc-probing algorithm can be used on ITR, ETR, and PITR devices. When you configure the rloc-probing algorithm, the Ingress Tunnel Router (ITR) sends a Map Request to an ETR with the Probe bit set. This action solicits a Map Reply with the Probe bit from the ETR. Use the rloc-probing algorithm only when the tcp-count and echo-nonce cannot determine the up and down status of the forwarding path. This algorithm is particularly useful for unidirectional traffic flows between two sites. In this case, an ETR that receives a Map-Request rloc-probe from an ITR can use the mapping data if supplied and if the ETR has accept-map-request-data configured. An ITR that receives a Map-Reply rloc-probe from an ETR can use the mapping data from the ETR's site for fast mapping data updates.

You can enable multiple algorithms concurrently, subject to the dependencies listed above with each algorithm.

You can view the status associated with each locator reachability algorithm by using the `show ip lisp map-cache` or `show ipv6 lisp map-cache` commands.

This command does not require a license.

## Examples

This example shows how to configure the locator reachability algorithm rloc-probing functionality on a Cisco NX-OS device:

```
switch# configure terminal
switch(config)# lisp loc-reach-algorithm rloc-probing
```

## Related Commands

Command	Description
<code>ip lisp etr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Egress Tunnel Router (ETR).
<code>ip lisp itr</code>	Configures the Cisco NX-OS device to act as an IPv4 LISP Ingress Tunnel Router (ITR).
<code>ipv6 lisp etr</code>	Configures the Cisco NX-OS device to act as an IPv6 LISP Egress Tunnel Router (ETR).
<code>ipv6 lisp itr</code>	Configures the Cisco NX-OS device to act as an IPv6 LISP Ingress Tunnel Router (ITR).
<code>show ip lisp map-cache</code>	Displays the current dynamic and static IPv4 EID-to-RLOC map-cache entries.



Command	Description
show ipv6 lisp map-cache	Displays the current dynamic and static IPv6 EID-to-RLOC map-cache entries.

# lisp locator-set

To specify a locator set for RTR RLOCs, use the **lisp locator-set** command. To disable this functionality, use the **no** form of this command.

**lisp locator-set** *name*

**no lisp locator-set** *name*

## Syntax Description

<i>name</i>	Locator set name.
-------------	-------------------

## Command Default

None

## Command Modes

VRF configuration (config-vrf) #

## Command History

Release	Modification
8.1(1)	This command was introduced.

## Usage Guidelines

Create a locator set and then specify the RTR RLOCs for the locator set. In the following example, a locator set set5000 is created, and RTR RLOCs 192.0.2.10 and 192.0.2.21 (connecting the RTR to IPv4 locator spaces) are associated with the locator set.

```
(config-vrf)# lisp locator-set set5000
                192.0.2.10 priority 1 weight 10
                192.0.2.21 priority 2 weight 20
```

### RTR locator-set inheritance

An RTR locator-set can be defined in the underlay VRF and can then be referenced in an overlay VRF. This configuration shows an example for RTR locator-set inheritance:

```
(config)# vrf context core
        ip lisp itr-etr
        ip lisp itr map-resolver 192.0.2.9/32
        ip lisp etr map-server 192.0.2.9/32 key 3 a97b0defe7b8ff70
        lisp locator-set setCore
                192.0.2.10 priority 1 weight 10
                192.0.2.21 priority 2 weight 20
        exit
        ip lisp multicast
        lisp encapsulation vxlan
```

The LISP locator-set setCore is defined in the underlay VRF core (as shown above) and then associated in the **lisp map-request itr-rlocs** command in the overlay VRF vrf5000 (as shown below).

```
(config)# vrf context vrf5000
```

```
ip lisp proxy-itr 192.0.2.1
ip lisp proxy-etr
lisp instance-id 5000
lisp map-request itr-rlocs setCore
ip lisp locator-vrf core
ip lisp map-cache 198.51.100.1/24 map-request
ip lisp map-cache 198.51.100.2/24 map-request
ip lisp multicast
lisp encapsulation vxlan
```

### Examples

This example shows how to specify a locator set for RTR RLOCs:

```
switch(config-vrf)# lisp locator-set set5000
                    192.0.2.10 priority 1 weight 10
                    192.0.2.21 priority 2 weight 20
```

### Related Commands

Command	Description
<b>lisp map-request itr-rlocs</b>	Defines RTR RLOCs to be used in the Map-Request messages generated by the RTR.

# lisp map-request itr-rlocs

To define RTR RLOCs to be used in Map-Request messages generated by the RTR, use the **lisp map-request itr-rlocs** command. To disable this functionality, use the **no** form of this command.

**lisp map-request itr-rlocs** *locator-set-name*

**no lisp map-request itr-rlocs** *locator-set-name*

## Syntax Description

<i>locator-set-name</i>	Locator set name.
-------------------------	-------------------

## Command Default

None

## Command Modes

VRF configuration (config-vrf) #

## Command History

Release	Modification
8.1(1)	This command was introduced.

## Usage Guidelines

After creating a locator set and specifying RTR RLOCs, you should define RTR RLOCs to be used in the Map-Request messages generated by the RTR. Though you can enable multiple locator-sets, only one of them can be active at a point in time, and that is determined by including the name in the **lisp map-request itr-rlocs** option.

**RTR locator-set inheritance**—This command is also used in RTR locator-set inheritance. An RTR locator-set can be defined in the underlay VRF and can then be referenced in an overlay VRF. An example is given below:

```
(config)# vrf context core
ip lisp itr-etr
ip lisp itr map-resolver 192.0.2.9/32
ip lisp etr map-server 192.0.2.9/32 key 3 a97b0defe7b8ff70
lisp locator-set setCore
    192.0.2.10 priority 1 weight 10
    192.0.2.21 priority 2 weight 20
exit
ip lisp multicast
lisp encapsulation vxlan
```

The LISP locator-set setCore is defined in the underlay VRF core (as shown above) and then associated in the **lisp map-request itr-rlocs** command in the overlay VRF vrf5000 (as shown below).

```
(config)# vrf context vrf5000
ip lisp proxy-itr 192.0.2.1
ip lisp proxy-etr
lisp instance-id 5000
lisp map-request itr-rlocs setCore
```

```
ip lisp locator-vrf core
ip lisp map-cache 198.51.100.1/24 map-request
ip lisp map-cache 198.51.100.2/24 map-request
ip lisp multicast
lisp encapsulation vxlan
```

### Examples

This example shows how to define RTR RLOCs to be used in the Map-Request messages generated by the RTR:

```
(config)# vrf context vrf5000
ip lisp proxy-itr 192.0.2.1
ip lisp proxy-etr
lisp instance-id 5000
lisp locator-set set5000
    192.0.2.10 priority 1 weight 10
    192.0.2.21 priority 2 weight 20
exit
lisp map-request itr-rlocs set5000
```

### Related Commands

Command	Description
<b>lisp locator-set</b>	Specifies a locator set for RTR RLOCs.

# lisp mobility

To configure an interface on an Ingress Tunnel Router (ITR) to participate in Locator/ID Separation Protocol (LISP) Virtual Machine (VM) mobility (dynamic-endpoint identifier (EID) roaming) for a specific dynamic-EID policy, use the **lisp mobility** command. To remove this functionality, use the **no** form of this command.

**lisp mobility dynamic-EID-policy-name**

**no lisp mobility dynamic-EID-policy-name**

## Syntax Description

dynamic-EID-polic-name	Name of the LISP dynamic-EID policy to apply to this interface.
------------------------	---

## Command Default

Disabled

## Command Modes

Interface configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

In order for an interface on an xTR to participate in LISP Virtual Machine (VM) Mobility (dynamic-EID roaming), it must be associated by name with a specific LISP dynamic-EID roaming policy. A LISP dynamic-EID roaming policy is configured by using the `lisp dynamic-eid` command. This policy is then associated with an interface when you enter the `lisp mobility dynamic-eid-policy-name` command, where the `dynamic-eid-policy-name` provides the association.

When a packet is received on an interface configured for LISP VM Mobility, the packet is considered a candidate for LISP VM Mobility (dynamic-EID roaming) and its source address is compared against the EID prefix in the database-mapping entry (or entries) included as part of the specific LISP dynamic-EID policy. If there is a match, the rules associated with LISP dynamic-EID roaming are applied. If there is no match, the packet is forwarded natively (that is not LISP encapsulated).

You can apply multiple `lisp mobility` commands that refer to different `dynamic-EID-policy-name` instances to the same interface. Packets received on the interface are compared against all policies until a match is found or the packet discarded.

**Caution**

In this release of LISP Virtual Machine (VM) Mobility, note the following:– When a dynamic-EID is roaming across subnets, you must configure it with a /32 IP address and an interface route to the default switch. For example, for a Linux or UNIX host, use the following configuration:ifconfig eth0 eid-address netmask 255.255.255.255route add default any-switch-addressarp -s any-switch-address 00:00:0e:1d:01:0c– All LISP VM-router interfaces (which is the interface the dynamic EID will roam to) must have the same MAC address. You can configure interfaces by using the mac-address 0000.0e1d.010c command.

**Note**

This feature is available for both IPv4 and IPv6. However, this feature is tested for IPv4 only. In addition, while necessary Address Resolution Protocol (ARP) changes have been made for IPv4, similar required changes for Neighbor Discovery (ND) for IPv6 have not been implemented.

When you configure lisp extended-subnet-mode on an interface, any dynamic-EID prefixes configured by using lisp mobility commands on the same interface must have more specific prefixes than any overlapping subnet prefixes. For example, if lisp extended-subnet-mode is configured on an interface that has a base subnet of a /24, when you enter the lisp mobility dyn-eid-name command, the EID prefix for dynamic-EID dyn-eid-name must be /25 or greater.

This command does not require a license.

**Examples**

This example shows how to configure the Roamer-1 policy defined under the LISP dynamic-EID configuration:

```
switch# configure terminal
switch(config)# interface Ethernet 2/0
switch(config-if)# lisp mobility Roamer-1
```

**Related Commands**

Command	Description
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map Server.
<b>lisp dynamic-eid</b>	Configures the LISP dynamic-EID roaming policy.
<b>lisp extended-subnet-mode</b>	Configures an interface to create a dynamic-EID state for hosts attached on their own subnet to track EID movement from one part of the subnet to another part of the same subnet.

# lisp site

To configure a Locator/ID Separation Protocol (LISP) site and enter site configuration mode on a LISP Map Server, use the **lisp site** command. To remove the LISP site, use the **no** form of this command.

**lisp site site-name**

**no lisp site site-name**

## Syntax Description

site-name	Name assigned to a LISP site locally.
-----------	---------------------------------------

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

To properly register a Locator/ID Separation Protocol (LISP) Egress Tunnel Router (ETR) with a Map Server, the Map Server must already have been configured with certain LISP site attributes that match the ETR attributes. At a minimum, these attributes include the EID prefix(es) to be registered by the ETR and a shared authentication key. On the ETR, these attributes are configured by using the `ip lisp database-mapping`, `ipv6 lisp database-mapping`, `ip lisp etr map-server`, and `ipv6 lisp etr map-server` commands.

When you enter the `lisp site` command, the referenced LISP site is created and you are placed in the site configuration mode. In this mode, all attributes associated with the referenced LISP site can be entered.

This command does not require a license.

## Examples

This example shows how to configure the LISP site and enter the site command mode:

```
switch# configure terminal
switch(config)# lisp site Customer-1
switch(config-lisp-site)#
```

## Related Commands

Command	Description
<code>ip lisp database-mapping</code>	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.



Command	Description
ip lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv4 EID prefixes.
ipv6 lisp database-mapping	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.
ipv6 lisp etr map-server	Configured the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv6 EID prefixes.





## M Commands

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- [map-notify-group](#), page 182
- [map-server](#), page 184

## map-notify-group

To configure a discovering Locator ID/Separation Protocol (LISP)-Virtual Machine (VM) switch to send a Map-Notify message to other LISP-VM switches within the same data center site so that they can also determine the location of the dynamic EID, use the **map-notify-group** command. To remove this functionality, use the **no** form of this command.

**map-notify-group ipv4-group-address**

**no map-notify-group ipv4-group-address**

### Syntax Description

ipv4-group-address	IPv4 multicast group address used for both sending and receiving site-based Map-Notify multicast messages.
--------------------	--

### Command Default

Disabled

### Command Modes

Dynamic-EID configuration mode

### Command History

Release	Modification
5.0(3.lisp-80)	This command was introduced.

### Usage Guidelines

Use the map-notify-group command when dynamic-EID discovery is necessary in a multihomed data center. When you configure a dynamic EID with more than one locator in the locator set, any locator can decapsulate LISP packets that enter the data center. Because unicast packets that egress the data center go out a single LISP-VM switch, this switch is the only one that can discover the location of a roaming dynamic EID. By using this command, the discovering LISP-VM switch sends Map-Notify messages to other LISP-VM switches (through the configured IPv4-group-address multicast group address) at the data center site, so that all LISP-VM switches can determine the location of the dynamic EID.

The multicast group address is used for both sending and receiving site-based Map-Notify multicast messages. The interface that the multicast Map-Notify messages are received on is the interface used to send decapsulated packets to the dynamic EID.

This command does not require a license.

### Examples

This example shows how to configure the LISP dynamic-EID policy, enter the dynamic EID configuration mode and configure the map notify group:

```
switch# configure terminal
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)# map-notify-group 239.1.1.254
```

**Related Commands**

Command	Description
<b>lisp mobility</b>	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).

## map-server

To configure the Map Server to which the dynamic-endpoint identifier (EID) registers to when this policy is invoked, use the **map-server** command. To remove the configured reference to the Map Server, use the **no** form of this command.

**map-server locator key key-type password**

**no map-server locator key key-type password**

**map-server locator proxy-reply**

**no map-server locator proxy-reply**

### Syntax Description

locator	IPv4 or IPv6 Routing Locator (RLOC) allowed within the Map-Registration message.
key key-type	Specifies the key type that the following SHA-1 password is using. Type (0) indicates that a cleartext password follows, Type (3) indicates that a 3DES encrypted key follows, and Type (7) indicates that a Cisco Type 7 encrypted password follows.
password	Password used to create the SHA-1 HMAC hash when authenticating the Map-Register message sent by the Egress Tunnel Router ETR.
proxy-reply	Specifies that the Map Register sent to the Map Server requests that the Map-Server proxy map reply on behalf of dynamic EIDs included in this policy.

### Command Default

By default, no Map Server is configured within a dynamic-EID policy and the configured Map Server on the LISP-VM router (from the {ip | ipv6} lisp etr map-server command) is used to register the dynamic EID.

### Command Modes

Dynamic-EID configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

In LISP Virtual Machine (VM) mobility, when a dynamic EID roams to the LISP-VM router, you must register the dynamic-EID to a Map-Server with its new attributes (the 3-tuple of locator, priority, weight) according to the database-mapping dynamic-EID subcommand). The map-server dynamic-EID subcommand configures

the Map Server to which the dynamic EID registers. The locator specified in the map-server command can be either an IPv4 or IPv6 address in the locator space.

You can configure multiple map-server commands so that registration can occur to different Map Servers with either the same or different authentication keys.

**Note**

You should configure the home Map Server, the one that the dynamic-EID initially registered to, as the dynamic-EID Map-Server.

If you do not enter the map-server dynamic-EID subcommand command, the configured Map-Server on the LISP-VM router that was configured by using the {ip | ipv6} lisp etr map-server command is used to register the dynamic EID.

If you configure the proxy-reply option, the Map Register sends Map-Server requests that the Map-Server proxy map-reply on behalf of dynamic EIDs when it receives a Map Request for the dynamic-EID prefix.

This command does not require a license.

**Examples**

This example shows how to configure the LISP dynamic-EID policy named Roamer-1, enter dynamic EID configuration mode, and configure the Map Server with IPv4 locator 10.1.1.1 for dynamic EIDs that match this policy to register to. You can also specify the Map Server to proxy reply on behalf of the dynamic EID.

```
switch# configure terminal
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)# map-server 10.1.1.1 key 3 1c27564ab1212434
switch(config-lisp-dynamic-eid)# map-server 10.1.1.1 proxy-reply
```

**Related Commands**

Command	Description
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map-Server.
<b>lisp mobility</b>	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).







## R Commands

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- [redistribute lisp route-map](#), page 188
- [register-database-mapping](#), page 190
- [roaming-eid-prefix](#), page 192

## redistribute lisp route-map

To configure the Border Gateway Protocol (BGP) on a Locator/ID Separation Protocol (LISP) Map Server to redistribute and advertise endpoint identifier (EID) prefixes from registered LISP sites, use the **redistribute lisp route-map** command. To remove the configuration, use the **no** form of this command.

**redistribute lisp route-map route-map**

**no redistribute lisp route-map route-map**

### Syntax Description

route-map	Route map.
-----------	------------

### Command Default

None

### Command Modes

BGP configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When a Map Server registers LISP sites, the EID prefixes from these registered LISP sites are advertised through BGP into the virtual routing and forwarding (VRF) instance that is used by the Locator/ID Separation Protocol Alternative Topology (LISP-ALT). This action can be accomplished by using the redistribute lisp route-map command.

Only after an Egress Tunnel Router (ETR) successfully registers through the Map-Registration process, the EID prefixes from that LISP site are advertised in the URIB or U6RIB by the LISP process. BGP then redistribute the EID prefixes, according to the route-map rules, into the LISP-ALT.



#### Note

We recommend that you use the route-tag under the eid-prefix command to simplify redistributing EID prefixes into BGP.

You must connect the Map Server to the LISP-ALT. For more information, see the ip lisp alt-vrf and ipv6 lisp alt-vrf command.

This command does not require a license.

### Examples

This example shows how to configure redistribution of registered LISP site EID prefixes, according to the rules of the route-map Valid-LISP:

```
switch# configure terminal
```

```

switch(config)# switch bgp 65001
switch(config-switch)# vrf lisp
switch(config-switch-vrf)# address-family ipv4 unicast
switch(config-switch-vrf)# redistribute lisp route-map Valid-LISP
switch(config-switch-vrf)# address-family ipv6 unicast
switch(config-switch-vrf)# redistribute lisp route-map Valid-LISP

```

**Related Commands**

Command	Description
<b>eid-prefix</b>	Configures the EID prefixes that are allowed in a Map-Register message sent by an ETR.
<b>ip lisp alt-vrf</b>	Configures which VRF that LISP should use when sending Map Requests for an IPv4 EID-to-RLOC mapping directly over the ALT.
ipv6 lisp alt-vrf	Configures which VRF that LISP should use when sending Map Requests for an IPv6 EID-to-RLOC mapping directly over the ALT.

# register-database-mapping

To configure the Locator Separation Protocol (LISP) Virtual Machine (VM) switch to register the dynamic endpoint identifier (EID) prefix from the database-mapping dynamic-EID subcommand rather than a more-specific host-EID, use the optional register-database-mapping command. To remove this optional functionality, use the no form of this command.

**register-database-mapping**

**no register-database-mapping**

**Syntax Description** This command has no arguments or keywords.

**Command Default** More-specific (host-EID) prefix is registered with the configured Map Server.

**Command Modes** Dynamic-EID configuration mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

Use the register-database-mapping command to cause the LISP VM switch to register the dynamic EID prefix from the database-mapping dynamic-EID subcommand rather than (more-specific) dynamic host-EIDs to the Map Server. By default, host-based dynamic-EIDs are registered to the Map Server.

You can use the register-database-mapping command to support cloud applications. When a dynamic EID matches the dynamic EID prefix from the database-mapping dynamic-EID subcommand, the entire dynamic-EID prefix is registered and all endpoint identifiers (EIDs) are moved to the new locator set.

This command does not require a license.

## Examples

This example shows how to configure the Locator/ID Separation Protocol (LISP) dynamic-EID policy, enter the dynamic EID configuration mode, and configure the policy to register the entire dynamic-EID prefix instead of individual dynamic host EIDs:

```
switch# configure terminal
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)# register-database-mapping
```

## Related Commands

Command	Description
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map Server.

Command	Description
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM Mobility (dynamic-EID roaming).

## roaming-eid-prefix

To configure an optional endpoint identifier (EID) or list of EIDs to be considered as roaming dynamic EIDs, use the `roaming-eid-prefix` command. To remove this optional functionality, use the `no` form of this command.

**roaming-eid-prefix eid-prefix**

**no roaming-eid-prefix eid-prefix**

### Syntax Description

eid-prefix	IPv4 or IPv6 EID prefix allowed to be considered as dynamic EIDs (roaming).
------------	---

### Command Default

Specific (host-EID) prefixes within the dynamic-EID prefix range specified in the database-mapping dynamic-EID subcommand are individually registered with the configured Map Server.

### Command Modes

Dynamic-EID configuration mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

When an EID is detected to be a candidate for dynamic-EID roaming and the optional `roaming-eid-prefix` command is used, the EID must be covered by the roaming-EID prefix entry in order to be discovered. The EID prefix listed in a database-mapping entry within the `lisp dynamic-eid` policy is registered with the Map Server specified in the `map-server` command. That is, the `roaming-eid-prefix` command restricts the discovery of LISP virtual machine (VM) Mobility (dynamic-EID roaming) for initiating Map-Server registration.



#### Note

Without this command, any EID within the EID prefix range configured through the database-mapping entry is discovered and registered.

The EID referenced by the `roaming-eid-prefix` command can be either an IPv4 or IPv6 address in the EID space.

This command does not require a license.

### Examples

This example shows how to configure the LISP dynamic-EID policy, enter dynamic-EID configuration mode, configure the IPv4 dynamic-EID prefix with an IPv4 locator, and configure the roaming EID prefix with the more-specific EID as the only EID prefix that invokes registration:

```
switch# configure terminal
```

```
switch(config)# lisp dynamic-eid Roamer-1
switch(config-lisp-dynamic-eid)# database-mapping 172.16.1.0/24 10.1.1.1 priority 1 weight
100
switch(config-lisp-dynamic-eid)# roaming-eid-prefix 172.16.1.12/32
```

**Related Commands**

Command	Description
<b>lisp site</b>	Configures a LISP site and enters site configuration mode on a Map Server.
lisp mobility	Configures an interface on an Ingress Tunnel Router (ITR) to participate in LISP VM mobility (dynamic-EID roaming).







## Show Commands

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- [show ip lisp](#), page 196
- [show ip lisp database](#), page 200
- [show ip lisp data-cache](#), page 201
- [show ip lisp locator-hash](#), page 202
- [show ip lisp map-cache](#), page 204
- [show ip lisp statistics](#), page 206
- [show ip lisp translation-cache](#), page 208
- [show ip mroute detail](#), page 209
- [show ip pim lisp encap](#), page 210
- [show ipv6 lisp](#), page 211
- [show ipv6 lisp database](#), page 215
- [show ipv6 lisp data-cache](#), page 216
- [show ipv6 lisp locator-hash](#), page 217
- [show ipv6 lisp map-cache](#), page 219
- [show ipv6 lisp statistics](#), page 221
- [show ipv6 lisp translation-cache](#), page 223
- [show lisp ddt queue](#), page 224
- [show lisp ddt referral-cache](#), page 225
- [show lisp ddt vrf](#), page 226
- [show lisp dynamic-eid](#), page 227
- [show lisp proxy-itr](#), page 229
- [show lisp site](#), page 230

# show ip lisp

To display the IPv4 Locator/ID Separation Protocol (LISP) configuration status, use the **show ip lisp** command.

## show ip lisp

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Any command mode

### Command History

Release	Modification
5.0(1.13)	This command was introduced.

### Usage Guidelines

This command does not require a license.

### Examples

This example shows how to configure the LISP site and enter the site command mode:

```
switch# show ip lisp
LISP IP Configuration Information for VRF "default" (iid 0)
  Ingress Tunnel Router (ITR):      enabled
  Egress Tunnel Router (ETR):      enabled
  Proxy-ITR Router (PTR):         disabled
  Proxy-ETR Router (PETR):        disabled
  Map Resolver (MR):              disabled
  Map Server (MS):                disabled
  Last-resort source locator:      172.22.156.23
  LISP-NAT Interworking:          disabled
  ITR send Map-Request:           enabled
  ITR send Data-Probe:            disabled
  LISP-ALT vrf:                   not configured
  ITR Map-Resolver:               172.22.156.35
  ETR Map-Server(s):              172.22.156.35, 172.22.132.89
  Last Map-Register sent to MS:   00:00:45
  ETR glean mapping:              disabled, verify disabled
  ETR accept mapping data:        disabled, verify disabled
  ETR map-cache TTL:              24 hours
  Shortest EID-prefix allowed:    /16
  Use Proxy-ETRs:                 172.16.2.1
Locator Reachability Algorithms:
  Echo-nonce algorithm:           disabled
  TCP-counts algorithm:           disabled
  RLOC-probe algorithm:           disabled
Static mappings configured:       0
Map-cache limit:                  10000
Map-cache size:                   3
ETR Database, global LSBs: 0x00000001:
  EID-prefix: 192.168.12.0/24, LSBs: 0x00000001
  Locator: 172.22.156.23, priority: 1, weight: 100
```

```
switch# Uptime: 09:27:15, state: up, local
```

The following table describes the significant fields shown in the display.

Field	Description
Ingress Tunnel Router (ITR)	Whether the router is configured as an Ingress Tunnel Router (ITR). For more information, see the ip lisp itr command.
Egress Tunnel Router (ETR)	Whether the router is configured as an ETR. For more information, see the ip lisp etr command.
Proxy-ITR	Whether the router is configured as a PITR. For more information, see the ip lisp proxy-itr command.
Map-Resolver (MR)	Whether the router is configured as an MR. For more information, see the ip lisp map-resolver command.
Map-Server (MS)	Whether the router is configured as an MS. For more information, see the ip lisp map-server command.
Last-resort source locator	Last-resort source locator for LISP messages.
LISP-NAT Interworking	Whether the router is configured for LISP Network Address Translation (NAT). For more information, see the ip lisp translate command.
ITR send Map-Request	Whether sending Map Requests is enabled. For more information, see the ip lisp itr map-resolver command.
ITR send Data-Probe	Whether ip lisp itr send-data-probe is enabled.
LISP-ALT vrf	Whether a LISP-ALT VRF configured and identifies the VRF name. For more information, see the ip lisp alt-vrf command.
ITR Map-Resolver	Ingress Tunnel Router (ITR) Map Resolver. For more information, see the ip lisp itr map-resolver command.
ETR Map-Server(s)	Configured ETR Map-Server(s). For more information, see the ip lisp etr map-server command.
Last Map-Register sent to MS	This field indicates when this device last sent a Map-Registration message to the configured Map-Server(s).
ETR glean mapping	Indicates whether the ETR is configured to glean mapping data contained in an encapsulated packet. For more information, see the ip lisp etr glean-mapping command.
ETR accept mapping data	Whether the ETR is configured to cache the mapping data contained in a Map Request. For more information, see the ip lisp etr accept-map-request-mapping command.

Field	Description
ETR map-cache TTL	Current ETR map-cache TTL. For more information, see the ip lisp etr map-cache-ttl command.
Shortest EID-prefix allowed	EID prefix length accepted in a Map Reply. For more information, see the ip lisp shortest-eid-prefix-length command.
Use Proxy-ETRs	Whether the router uses a PETR and lists the PETR locator.
Locator Reachability Algorithms	Status of the available locator reachability algorithms (Echo-nonce, TCP-counts, RLOC-probing). For more information, see the lisp loc-reach-algorithm command.
Static mappings configured	Number of static cache-map entries are configured. For more information, see the ipv6 lisp map-cache command.
Map-cache limit	Indicates the current map cache limit and any configured reserve list. For more information, see the ip lisp map-cache-limit command.
Map-cache size	Current number of entries in the map-cache.
ETR Database	Global LSBs, configured EID prefixes, and locators.

### Related Commands

Command	Description
ip lisp etr	Configures the router to act as an IPv4 LISP Egress Tunnel Router (ETR).
ip lisp etr accept-map-request-mapping	Configures an ETR to cache IPv4 mapping data contained in a Map-Request message.
ip lisp etr glean-mapping	Configures an ETR to glean inner header (EID) source address to outer header (RLOC) source address mappings from encapsulated data packets to its EID-to-RLOC cache IPv4 mapping data.
ip lisp etr map-cache-ttl	Configures the TTL value inserted into a LISP Map-Reply message sent by an ETR in response to a Map-Request for an IPv4 EID-to-RLOC mapping.
ip lisp etr map-server	Configured the IPv4 or IPv6 locator address of the LISP Map-Server to which an ETR should register for its IPv4 EID prefixes.
ip lisp itr	Configures the router to act as an IPv4 LISP Ingress Tunnel Router (ITR)

Command	Description
ip lisp itr map-resolver	Configures the IPv4 or IPv6 locator address of the LISP Map-Resolver to which the Ingress Tunnel Router (ITR) sends IPv4 Map-Request messages.
ip lisp itr send-data-probes	Configures an Ingress Tunnel Router (ITR) or PITR to send a data probe rather than a Map-Request message for IPv4 EID-to-RLOC mapping resolution.
ip lisp map-cache	Configures a static IPv4 EID prefix to the locator map-cache entry.
ip lisp map-cache-limit	Configures the maximum number of IPv4 LISP map-cache entries allowed to be stored by the router.
ip lisp source- locator	Configures a source locator to be used for an IPv4 LISP encapsulated packets.
ip lisp proxy-etr	Configures the router to act as an IPv4 LISP Proxy Egress Tunnel Router (PETR).
ip lisp proxy-itr	Configures the router to act as an IPv4 LISP Proxy Ingress Tunnel Router (PITR).
ip lisp use-petr	Configures an Ingress Tunnel Router (ITR) or PITR to use the PETR for traffic destined to non-LISP IPv4 destinations.

# show ip lisp database

To display Locator/ID Separator Protocol (LISP) Egress Tunnel Router (ETR) configured local IPv4 endpoint identifier (EID) prefixes and associated locator sets, use the **show ip lisp database** command in privileged EXEC mode.

**show ip lisp database** [vrf vrf-name]

## Syntax Description

vrf vrf-name	Displays information for the specified virtual routing and forwarding (VRF) instance.
--------------	---

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

This command does not require a license.

## Examples

This example shows how to display the configured local IPv4 EID prefixes and associated locator sets:

```
switch# show running configuration
...<skip>...
!
ip lisp database-mapping 192.168.12.0/24 172.22.156.23 priority 1 weight 100
!
switch# show ip lisp database
LISP ETR IP Mapping Database for VRF "default" (iid 0), global LSBs: 0x00000001
EID-prefix: 192.168.12.0/24, instance-id: 0, LSBs: 0x00000001
  Locator: 172.22.156.23, priority: 1, weight: 100
      Uptime: 10:36:59, state: up, local
switch#
```

## Related Commands

Command	Description
<b>ip lisp database-mapping</b>	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.

# show ip lisp data-cache

To display the Locator ID/Separation Protocol IPv4 endpoint identifier to Routing Locator (LISP) IPv4 EID-to-RLOC data-cache mapping on an Ingress Tunnel Router (ITR), use the **show ip lisp data-cache** command.

**show ip lisp data-cache [destination-EID]**

**Syntax Description**

destination-EID	(Optional) Destination EID to display mapping for.
-----------------	--

**Command Default**

None

**Command Modes**

Any command mode

**Command History**

Release	Modification
5.0(1.13)	This command was introduced.

**Usage Guidelines**

Data-cache mappings are built when a Map-Request is sent and are maintained until a valid (matching nonce) Map Reply is received. The data-cache entry is then moved to the map cache.

This command does not require a license.

**Examples**

This example shows how to display the LISP IPv4 EID-to-RLOC data-cache mapping on an Ingress Tunnel Router (ITR):

```
switch# show ip lisp data-cache
LISP IP Mapping Data Cache for Context "default", 0 entries, hwm: 4
Complete entries removed after 15-second period: 0
Incomplete entries removed after 1-minute period: 0
switch#
```

**Related Commands**

Command	Description
ip lisp map-cache	Displays the current dynamic and static IPv4 EID-to-RLOC map-cache entries.

# show ip lisp locator-hash

To display source and destination locators that are used for a given IPv4 source and destination endpoint identifier (EID) pair, use the show ip lisp locator-hash command.

**show ip lisp locator-hash** *{source-EID dest-EID| dest-EID-prefix}* [**vrf** *vrf-name*]

## Syntax Description

source-EID	IPv4 source EID.
dest-EID	IPv4 destination EID.
dest-EID-prefix	IPv4 destination EID prefix.
vrf vrf-name	(Optional) Specifies the VRF within which to resolve EIDs.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The source locator is chosen based on the source EID from the EID prefix database configured by using the ip lisp etr database-mapping command. The destination locator is selected by finding the destination EID in the EID-to-Routing Locator (RLOC) map cache.

When the dest-EID-prefix argument is used, the locator hash array indicates which locator is used for each of 25 different flow hash buckets.

When you enter the vrf keyword, IPv4 EIDs are resolved within the specified VRF in order to display the locator hash.

This command does not require a license.

## Examples

This example shows how to display source and destination locators that are used for a given IPv4 source and destination EID pair:

```
switch# show ip lisp database
LISP ETR IP Mapping Database for VRF "default", global LSBs: 0x00000001
EID-prefix: 153.16.12.0/24, LSBs: 0x00000001
Locator: 128.223.156.23, priority: 1, weight: 100
```



```

Uptime: 04:14:41, state: up, local
switch# show ip lisp map-cache
---<skip>---
153.16.11.0/24, uptime: 04:12:35, expires: 19:47:24, via map-reply, auth
  Locator      Uptime      State      Priority/  Data      Control
              Uptime      State      Weight    in/out    in/out
              67.169.7.150 04:12:35  up        1/100     1968/1967 3/2
switch# show ip lisp locator-hash 153.16.12.1 153.16.11.1
EIDs 153.16.12.1 -> 153.16.11.1 yields:
  RLOCs 128.223.156.23 -> 67.169.7.150
  Address hash: 0x07 (7), hash bucket: 7, RLOC index: 0
switch#

```

**Related Commands**

Command	Description
<b>ip lisp database-mapping</b>	Configures an IPv4 EID-to-RLOC mapping relationship and its associated traffic policy.

# show ip lisp map-cache

To display the current dynamic and static IPv4 endpoint identifier to Routing Locator (EID-to-RLOC) map-cache entries, use the show ip lisp map-cache command.

**show ip lisp map-cache** [*destination-EID*| *destination-EID-prefix/prefix-length*] **vrf** *vrf-name*]

## Syntax Description

<i>destination-EID</i>	(Optional) Destination EID to display mapping for.
<i>destination-EID-prefix/prefix-length</i>	(Optional) Destination EID prefix to display mapping for.
<b>vrf</b> <i>vrf-name</i>	(Optional) Displays detailed EID-to-RLOC cache mapping information for the referenced virtual routing and forwarding (VRF) instance.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

When no IPv4 EID or IPv4 EID prefix is specified, a summary of information is listed for all current dynamic and static IPv4 EID-to-RLOC map-cache entries. When you specify an IPv4 EID or IPv4 EID prefix, information is listed for the longest-match lookup in the cache. When you use the vrf keyword, summary information related to the referenced VRF name is listed.

This command does not require a license.

## Examples

This example shows how to display a summary list of current dynamic and static IPv4 EID-to-RLOC map-cache entries:

```
switch# show ip lisp map-cache
LISP IP Mapping Cache for VRF "default", 4 entries
153.16.1.0/24, uptime: 04:41:40, expires: 19:18:19, via map-reply, auth
  Locator      Uptime      State      Priority/  Data      Control
                Weight      in/out    in/out
    129.250.1.255  04:41:40  up        254/0     0/0       0/0
    129.250.26.242 04:41:40  up        1/100    1139/1138 1/0
---<skip>---
switch#
```

This example shows how to display a specific IPv4 EID prefix information that is associated with that IPv4 EID prefix entry:

```
switch# show ip lisp map-cache 153.16.11.0/24
LISP IP Mapping Cache for VRF "default", 4 entries
153.16.11.0/24, uptime: 04:43:21, expires: 19:16:38, via map-reply, auth
  State: complete, last modified: 04:43:21, map-source: 67.169.7.150
  Locator      Uptime      State      Priority/  Data      Control
              in/out      in/out
67.169.7.150  04:43:21  up        1/100     2214/2213  3/2
  Last up/down state change: 04:43:21, state change count: 0
  Last data packet in/out:   00:00:14/00:00:14
  Last control packet in/out: 00:45:23/00:45:23
  Last priority/weight change: never/never
switch#
```

### Related Commands

Command	Description
<b>show ip lisp</b>	Displays the IPv4 LISP configuration status for the local device.

# show ip lisp statistics

To display Locator/ID Separation Protocol (LISP) IPv4 address-family packet count statistics, use the show ip lisp statistics command.

## show ip lisp statistics

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Any command mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** This command does not require a license.

**Examples** This example shows how to display LISP IPv4 address-family packet count statistics:

```
switch# show ip lisp statistics
LISP Statistics for VRF "default" - last cleared: never
Data Forwarding:
  IPv4-in-IPv4 encap/decap packets:    4687/33220
  IPv4-in-IPv6 encap/decap packets:    0/3555
  Translated packets in/out:          0/0
  Map-cache lookup succeeded/failed:   5908/78
  LISP-ALT lookup succeeded/failed:    0/0
  Packets with SMRs in/out:           0/0
  Loc-reach-bit changes local/remote:  0/0
Control Packets:
  Data-Probes in/out:                  0/0
  Map-Requests in/out:                 654/90
    Encapsulated Map-Requests in/out:  0/90
    RLOC-probe Map-Requests in/out:    607/0
  Map-Replies in/out:                 73/654
    Authoritative in/out:              4/654
    Non-authoritative in/out:          69/0
    Negative Map-Replies in/out:       69/0
    RLOC-probe Map-Replies in/out:     0/607
  Map-Registers in/out:               0/294
    Authentication failures:           0
Errors:
  Encapsulations failed:               78
  Map-Request format errors:           0
  Map-Reply format errors:             0
  Map-Reply spoof alerts:              0
Cache Related:
  Cache entries created/timed-out:     40/36
  Number of EID-prefixes in map-cache: 4
```

```
Number of negative map-cache entries: 1
Number of translation cache entries: 0
Total number of RLOCs in map-cache: 6
Number of best-priority RLOCs: 5
Average RLOCs per EID-prefix: 1
```

```
switch#
```

**Related Commands**

Command	Description
<b>show ip lisp</b>	Displays the IPv4 LISP configuration status for the local device.

# show ip lisp translation-cache

To display the Locator/ID Separation Protocol (LISP) IPv4 address translation cache and statistics associated with each entry, use the show ip lisp translation-cache command.

**show ip lisp translation-cache [non-routable-EID]**

## Syntax Description

non-routable-EID	(Optional) IPv4 address of the inside nonroutable endpoint identifier (EID).
------------------	--

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The show ip lisp translation-cache command is applicable only when the ip lisp translate command is used to configure LISP translation.

When you use the non-routable-EID argument, only the statistics associated with that single translation appear.

This command does not require a license.

## Examples

This example shows how to display the LISP IPv4 address translation cache and statistics associated with each entry:

```
switch# show ip lisp translation-cache
LISP EID Translation Cache for VRF "default" - 1 entries
Inside: 10.1.1.1 outside: 172.16.1.1, ingress/egress count: 0/0
  Last ingress packet: never, last egress packet: never
switch#
```

## Related Commands

Command	Description
show ip lisp	Displays the IPv4 LISP configuration status for the local device.

# show ip mroute detail

To display the detailed route attributes, use the show ip mroute detail command.

## show ip mroute detail

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** VRF configuration mode

Command History	Release	Modification
	6.2(2)	This command was introduced.

**Usage Guidelines** This command does not require a license.

**Examples** This example shows how to display the Locator ID/Separation Protocol (LISP) IPv4 address translation cache and statistics associated with each entry:

```
switch(config)# vrf context management

switch(config-vrf)# show ip mroute detail
IP Multicast Routing Table for VRF "default"
Total number of routes: 0
Total number of (*,G) routes: 0
Total number of (S,G) routes: 0
Total number of (*,G-prefix) routes: 0

switch(config-vrf)#
```

## Related Commands

Command	Description
show ip lisp	Displays the IPv4 LISP configuration status for the local device.

# show ip pim lisp encap

To display the information about the LOcator ID/Separation Protocol (LISP) encapsulation, use the **show ip pim lisp encap** command.

**show ip pim lisp encap**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** VRF configuration mode

Command History	Release	Modification
	6.2(2)	This command was introduced.

**Usage Guidelines** This command does not require a license.

**Examples** This example shows how to display the information about the LISP encapsulation:

```
switch(config)# vrf context management
switch(config-vrf)# show ip pim lisp encap
switch(config-vrf)#
```

Related Commands	Command	Description
	show ip lisp	Displays the IPv4 LISP configuration status for the local device.



# show ipv6 lisp

To display the only IPv6 configuration status, use the show ipv6 lisp command.

**show ipv6 lisp**

**Syntax Description** This command has no arguments or keywords

**Command Default** None

**Command Modes** Any command mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** This command does not require a license.

**Examples** This example shows how to display the Locator ID/Separation Protocol (LISP) IPv6 configuration status:

```
switch# show ipv6 lisp
LISP IPv6 Configuration Information for VRF "default" (iid 0)
  Ingress Tunnel Router (ITR):      enabled
  Egress Tunnel Router (ETR):      enabled
  Proxy-ITR Router (PTR):          disabled
  Proxy-ETR Router (PETR):         disabled
  Map Resolver (MR):               disabled
  Map Server (MS):                disabled
  Last-resort source locator:      2001:db8:d01:9c::80df:9c17
  LISP-NAT Interworking:           disabled
  ITR send Map-Request:            enabled
  ITR send Data-Probe:             disabled
  LISP-ALT vrf:                    not configured
  ITR Map-Resolver:                172.22.156.35
  ETR Map-Server(s):              172.22.156.35, 172.22.132.89
  Last Map-Register sent to MS:    00:00:20
  ETR glean mapping:               disabled, verify disabled
  ETR accept mapping data:         disabled, verify disabled
  ETR map-cache TTL:               24 hours
  Send IP Map-Reply:               enabled
  Shortest EID-prefix allowed:     /48
  Use Proxy-ETRs:                  172.16.2.1
Locator Reachability Algorithms:
  Echo-nonce algorithm:            disabled
  TCP-counts algorithm:            disabled
  RLOC-probe algorithm:            disabled
  Static mappings configured:      0
  Map-cache limit:                 1000
  Map-cache size:                  3
  ETR Database, global LSBs: 0x00000001:
  EID-prefix: 2001:db8:1203::/48, LSBs: 0x00000001
```

```

Locator: 172.22.156.23, priority: 1, weight: 100
Uptime: 09:27:51, state: up, local
switch#

```

The following table describes the significant fields shown in the display.

Field	Description
Ingress Tunnel Router (ITR)	Whether the router is configured as an Ingress Tunnel Router (ITR). For more information, see the <code>ipv6 lisp itr</code> command.
Egress Tunnel Router (ETR)	Whether the router is configured as an ETR. For more information, see the <code>ipv6 lisp etr</code> command.
Proxy-ITR	Whether the router is configured as a PITR. For more information, see the <code>ipv6 lisp proxy-itr</code> command.
Proxy-ETR	Whether the router is configured as a PETR. For more information, see the <code>ipv6 lisp proxy-etr</code> command.
Last-resort source locator	Last-resort source locator for LISP messages.
LISP-NAT Interworking	Whether the router is configured for LISP Network Address Translation (NAT). For more information, see the <code>ipv6 lisp translate</code> command.
ITR send Map-Request	Whether sending Map Requests is enabled. For more information, see the <code>ipv6 lisp itr map-resolver</code> command.
ITR send Data-Probe	Whether IPv6 LISP Ingress Tunnel Router (ITR) <code>send-data-probe</code> is enabled.
LISP-ALT vrf	Whether a LISP-ALT VRF is configured and identifies the VRF name. For more information, see the <code>ipv6 lisp alt-vrf</code> command.
ITR Map-Resolver	Configured Ingress Tunnel Router (ITR) Map Resolver. For more information, see the <code>ipv6 lisp itr map-resolver</code> command.
ETR Map-Server(s)	Configured ETR Map Server. For more information, see the <code>ipv6 lisp etr map-server</code> command.
Last Map-Register sent to MS	When this device last sent a Map-Registration message to the configured Map Server.
ETR glean mapping	Whether the ETR is configured to glean mapping data contained in an encapsulated packet. For more information, see the <code>ipv6 lisp etr glean-mapping</code> command.

Field	Description
ETR accept mapping data	Whether the ETR is configured to cache the mapping data contained in a Map Request. For more information, see the <code>ipv6 lisp etr accept-map-request-mapping</code> command.
ETR map-cache TTL	Current ETR map-cache TTL. For more information, see the <code>ipv6 lisp etr map-cache-ttl</code> command.
Shortest EID-prefix allowed	EID prefix length accepted in a Map Reply. For more information, see the <code>ipv6 lisp shortest-eid-prefix-length</code> command.
Use Proxy-ETRs	Whether the router uses a PETR and lists the PETR locator.
Locator Reachability Algorithms	Status of the available locator reachability algorithms (Echo-nonce, TCP-counts, RLOC-probing). For more information, see the <code>lisp loc-reach-algorithm</code> command.
Static mappings configured	Number of static cache-map entries that are configured. For more information, see the <code>ipv6 lisp map-cache</code> command.
Map-cache limit	Current map-cache limit and any configured reserve list. For more information, see the <code>ipv6 lisp map-cache-limit</code> command.
Map-cache size	Current number of entries in the map cache.
ETR Database	Global LSBs, configured EID prefixes, and locators.

**Related Commands**

Command	Description
<code>ip lisp etr</code>	Configures the router to act as an IPv4 LISP Egress Tunnel Router (ETR).
<code>ip lisp etr accept-map-request-mapping</code>	Configures an ETR to cache IPv4 mapping data contained in a Map-Request message.
<code>ip lisp etr glean-mapping</code>	Configures an ETR to glean the inner header (EID) source address to the outer header (RLOC) source address mappings from encapsulated data packets to its IPv4 EID-to-RLOC data cache mapping.

Command	Description
ip lisp etr map-cache-ttl	Configures the TTL value inserted into a LISP Map Reply message sent by an ETR in response to a Map Request for an IPv4 EID-to-RLOC mapping.
ip lisp etr map-server	Configures the IPv4 or IPv6 locator address of the LISP Map Server to which an ETR should register for its IPv4 EID prefixes.
ip lisp itr	Configure the router to act as an IPv4 LISP Ingress Tunnel Router (ITR).
ip lisp itr map-resolver	Configures the IPv4 or IPv6 locator address of the LISP Map Resolver to which the Ingress Tunnel Router (ITR) sends IPv4 Map Request messages.
ip lisp itr send-data-probes	Configures an Ingress Tunnel Router (ITR) or PITR to a data probe rather than a Map-Request message for IPv4 EID-to-RLOC mapping resolution.
ip lisp map-cache	Configures a static IPv4 EID prefix to the locator map-cache entry.
ip lisp map-cache-limit	Configures the maximum number of IPv4 LISP map-cache entries allowed to be stored by the router.
ip lisp source-locator	Configures a source locator to be used for an IPv4 LISP-encapsulated packets.
ip lisp proxy-etr	Configures the router to act as an IPv4 LISP Proxy Egress Tunnel Router (PETR).
ip lisp proxy-itr	Configures the router to act as an IPv4 LISP Proxy Ingress Tunnel Router (PITR).
ip lisp use-petr	Configures an Ingress Tunnel Router (ITR) or PITR to use the PETR for traffic destined to non-LISP IPv4 destinations.

# show ipv6 lisp database

To display Locator/ID Separation Protocol (LISP) Egress Tunnel Router (ETR) configured local IPv6 EID prefixes and associated locator sets, use the **show ip lisp database** command.

**show ipv6 lisp database [vrf vrf-name]**

## Syntax Description

vrf vrf-name	(Optional) Displays information for the specified virtual routing and forwarding (VRF) instance.
--------------	--

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

This command does not require a license.

## Examples

This example shows how to display the configured local IPv6 EID prefixes and the associated locator sets:

```
switch# show ipv6 lisp database
LISP ETR IPv6 Mapping Database for VRF "default" (iid 0), global LSBs: 0x0000000f
EID-prefix: 2001:db8:1209::/48, instance-id: 0, LSBs: 0x0000000f
      172.22.156.222, priority: 1, weight: 100, state: up, local
switch#
```

## Related Commands

Command	Description
<b>ipv6 lisp database-mapping</b>	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.

# show ipv6 lisp data-cache

To display the Locator/ID Separation Protocol (LISP) IPv6 endpoint identifier to Routing Locator (EID-to-RLOC) data-cache mapping on an Ingress Tunnel Router (ITR), use the **show ipv6 lisp data-cache** command.

**show ipv6 lisp data-cache [destination-EID]**

## Syntax Description

destination-EID	(Optional) Destination EID to display mapping for.
-----------------	--

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

Data-cache mappings are built when a Map Request is sent and are maintained until a valid (matching nonce) Map Reply is received. The data-cache entry is then moved to the map cache.

This command does not require a license.

## Examples

This example shows how to display the LISP IPv6 EID-to-RLOC data-cache mapping on an Ingress Tunnel Router (ITR):

```
switch# show ipv6 lisp data-cache
LISP IPv6 Mapping Data Cache for Context "default", 0 entries, hwm: 1
Complete entries removed after 15-second period: 0
Incomplete entries removed after 1-minute period: 1

switch#
```

## Related Commands

Command	Description
<b>ipv6 lisp map-cache</b>	Displays the current dynamic and static IPv6 EID-to-RLOC map-cache entries.

# show ipv6 lisp locator-hash

To display source and destination locators that are used for a given IPv6 source and destination endpoint identifier (EID) pair, use the **show ip lisp locator-hash** command.

**show ipv6 lisp locator-hash** [*source-EID dest-EID* | *dest-EID/prefix* | **vrf** *vrf-name*]

## Syntax Description

source-EID	IPv6 source EID.
dest-EID	IPv6 destination EID.
dest-EID-prefix	IPv6 destination EID prefix.
vrf vrf-name	(Optional) Specifies the virtual routing and forwarding (VRF) instance with which to resolve EIDs.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The source locator is chosen based on the source EID from the EID prefix database that you configured by using the `ipv6 lisp etr database-mapping` command. The destination locator is selected by finding the destination EID in the EID-to- Routing Locator (RLOC) map cache.

When you use the `dest-EID-prefix` argument, the locator hash array appears, indicating which locator is used for each of 25 different flow hash buckets.

When you use the `vrf` keyword, IPv4 EIDs are resolved within the specified VRF in order to display the locator hash.

This command does not require a license.

## Examples

This example shows how to display source and destination locators that are used for a given IPv6 source and destination EID pair:

```
switch# show ipv6 lisp map-cache
---<skip>---
2610:d0:210f::/48, uptime: 04:18:39, expires: 19:41:20, via map-reply, auth
```

## show ipv6 lisp locator-hash

```

Locator           Uptime      State      Priority/  Data      Control
                  04:18:39   up         Weight    in/out    in/out
85.184.2.10       04:18:39   up         0/100     0/0       0/0
2001:6e0:4:2::2  04:18:39   up         0/100     0/0       0/0
switch# show ipv6 lisp locator-hash 2610:d0:1203::1 2610:d0:210f::1
EIDs 2610:d0:1203::1 -> 2610:d0:210f::1 yields:
  RLOCs 128.223.156.23 -> 85.184.2.10
  Address hash: 0x00 (0), hash bucket: 0, RLOC index: 0
switch#

```

The example shows how to display the full locator hash bucket for the IPv6 destination EID prefix:

```

switch# show ipv6 lisp locator-hash 2610:d0:210f::/48
RLOC Hash Indexes for EID-prefix 2610:d0:210f::/48:
[00000-00000-00000-00000-00000]
switch#

```

## Related Commands

Command	Description
<b>ipv6 lisp database-mapping</b>	Configures an IPv6 EID-to-RLOC mapping relationship and its associated traffic policy.



# show ipv6 lisp map-cache

To display the current dynamic and static IPv6 endpoint identifier to Routing Locator (EID-to-RLOC) map-cache entries, use the show ipv6 lisp map-cache command.

**show ipv6 lisp map-cache** [**destination-EID**| *destination-EID/prefix-prefix-length*| **vrf vrf-name**]

## Syntax Description

destination-EID	(Optional) Destination EID to display mapping for.
destination-EID-prefix/prefix-length	(Optional) Destination EID prefix to display mapping for.
vrf vrf-name	(Optional) Displays detailed EID-to-RLOC cache mapping information for the referenced virtual routing and forwarding (VRF) instance.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

Use the show ipv6 lisp map-cache command to display the current dynamic and static IPv6 EID-to-RLOC map-cache entries. When you do not specify the IPv6 EID or IPv6 EID prefix, a summary of information is listed for all current dynamic and static IPv4 EID-to-RLOC map-cache entries.

This command does not require a license.

## Examples

This example shows how to display a summary of current dynamic and static IPv6 EID-to-RLOC map-cache entries:

```
switch# show ipv6 lisp map-cache
LISP IPv6 Mapping Cache for VRF "default", 1 entries
2610:d0:210f::/48, uptime: 04:48:44, expires: 19:11:15, via map-reply, auth
  Locator      Uptime      State      Priority/  Data      Control
                Weight      in/out    in/out
    85.184.2.10  04:48:44   up         0/100     0/0       0/0
    2001:6e0:4:2::2 04:48:44   up         0/100     0/0       0/0
---<skip>---
switch#
```

This example shows how to display information associated with that IPv6 EID prefix entry with a specific IPv6 EID prefix:

```
switch# show ipv6 lisp map-cache 2610:d0:210f::/48
LISP IPv6 Mapping Cache for VRF "default", 1 entries
2610:d0:210f::/48, uptime: 04:50:43, expires: 19:09:16, via map-reply, auth
State: complete, last modified: 04:50:43, map-source: 85.184.2.10
Locator      Uptime      State      Priority/  Data      Control
            Weight     in/out    in/out
85.184.2.10  04:50:43  up         0/100     0/0       0/0
  Last up/down state change: 04:50:43, state change count: 0
  Last data packet in/out:   never/never
  Last control packet in/out: never/never
  Last priority/weight change: never/never
2001:6e0:4:2::2 04:50:43  up         0/100     0/0       0/0
  Last up/down state change: 04:50:43, state change count: 0
  Last data packet in/out:   never/never
  Last control packet in/out: never/never
  Last priority/weight change: never/never
switch#
```

#### Related Commands

Command	Description
<b>show ipv6 lisp</b>	Displays the IPv6 LISP configuration status for the local device.

# show ipv6 lisp statistics

To display Locator ID/Separation Protocol (LISP) IPv6 address-family packet count statistics, use the **show ipv6 lisp statistics** command.

**show ipv6 lisp statistics**

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** Any command mode

Command History	Release	Modification
	5.0(1.13)	This command was introduced.

**Usage Guidelines** This command does not require a license.

**Examples** This example shows how to display LISP IPv6 address-family packet count statistics:

```
switch# show ipv6 lisp statistics
LISP Statistics for VRF "default" - last cleared: never
Data Forwarding:
  IPv6-in-IPv4 encap/decap packets:    1239/0
  IPv6-in-IPv6 encap/decap packets:    0/0
  Translated packets in/out:          0/0
  Map-cache lookup succeeded/failed:   2461/1260
  LISP-ALT lookup succeeded/failed:    0/0
  Packets with SMRs in/out:            0/0
  Loc-reach-bit changes local/remote:  0/0
Control Packets:
  Data-Probes in/out:                  0/0
  Map-Requests in/out:                  1219/1280
  Encapsulated Map-Requests in/out:    0/1280
  RLOC-probe Map-Requests in/out:      0/0
  Map-Replies in/out:                  1243/1217
  Authoritative in/out:                 1243/1219
  Non-authoritative in/out:             0/0
  Negative Map-Replies in/out:         0/0
  RLOC-probe Map-Replies in/out:       0/0
  Map-Registers in/out:                 0/614
  Authentication failures:              0
Errors:
  Encapsulations failed:                1260
  Map-Request format errors:            0
  Map-Reply format errors:              0
  Map-Reply spoof alerts:               0
Cache Related:
  Cache entries created/timed-out:     32/27
  Number of EID-prefixes in map-cache:  5
```

**show ipv6 lisp statistics**

```
Number of negative map-cache entries: 4
Number of translation cache entries: 0
Total number of RLOCs in map-cache: 6
Number of best-priority RLOCs: 6
Average RLOCs per EID-prefix: 1
```

```
switch#
```

**Related Commands**

Command	Description
<b>show ipv6 lisp</b>	Displays the IPv6 LISP configuration status for the local device.

# show ipv6 lisp translation-cache

To display the Locator/ID Separation Protocol (LISP) IPv6 address translation cache and statistics associated with each entry, use the **show ipv6 lisp translation-cache** command.

**show ipv6 lisp translation-cache [non-routable-EID]**

## Syntax Description

non-routable-EID	(Optional) IPv4 address of the inside nonroutable endpoint (EID).
------------------	---

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The show ipv6 lisp translation-cache command is applicable only when the ipv6 lisp translate command is used to configure LISP translation.

When you use the non-routable-EID argument, only the statistics that are associated with that single translation are displayed.

This command does not require a license.

## Examples

This example shows how to display the LISP IPv6 address translation cache and statistics associated with each entry:

```
switch# show ipv6 lisp translation-cache
LISP EID Translation Cache for VRF "default" - 1 entries
Inside: 2001:db8:aa::1 outside: 2001:db8:bb::1, ingress/egress count: 0/0
  Last ingress packet: never, last egress packet: never
switch#
```

## Related Commands

Command	Description
<b>show ipv6 lisp</b>	Displays the IPv6 LISP configuration status for the local device.

# show lisp ddt queue

To display the Locator ID/Separation Protocol (LISP) Delegate Database Tree (DDT)map-resolver map-request queue, use the show lisp ddt queue command.

**show lisp ddt queue** [*eid-address* | *instance-id* **id** *eid-address* | **vrf** *vrf-name*]

## Syntax Description

eid-address	IPv4 or IPv6 IP address.
instance-id	Displays the instance ID summary.
id	Instance ID for EID prefix. The range is from 0 to 16777215. The default value is 0.
vrf	Displays the information for a virtual routing and forwarding (VRF) instance.
vrf-name	VRF name. The maximum size is 32 alphanumeric character.

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
6.2(2)	This command was introduced.

## Usage Guidelines

This command does not require a license.

## Examples

This example shows how to display the LISP DDT Map-Resolver map-request queue:

```
switch(config)# show lisp ddt queue
switch(config)#
```

# show lisp ddt referral-cache

To display the Locator ID/Separation Protocol (LISP)- Delegated Database Tree (DDT) referral cache, use the **show lisp ddt referral-cache** command.

**show lisp ddt referral-cache** {*eid-address* *vrf vrf-name*| *instance-id* **id** *eid-address* *vrf vrf-name*}

## Syntax Description

eid-address	IPv4 or IPv6 IP address.
instance-id	Displays the instance ID summary.
id	Instance ID for EID prefix. The range is from 0 to 16777215. The Default value is 0.
vrf	Displays the information for a virtual routing and forwarding (VRF) instance.
vrf-name	VRF name. The maximum size is 32 alphanumeric character.

## Command Default

None

## Command Modes

Global configuration mode

## Command History

Release	Modification
6.2(2)	This command was introduced.

## Usage Guidelines

This command does not require a license.

## Examples

This example shows how to display the LISP-DDT referral cache:

```
switch(config)# show lisp ddt referral-cache
switch(config)#
```

# show lisp ddt vrf

To display the configured Delegated Database Tree (DDT) root(s) and/or DDT delegation nodes on a switch enabled for Locator ID/Separator Protocol (LISP) DDT, use the **show lisp ddt vrf** command.

**show lisp ddt vrf vrf-name**

## Syntax Description

vrf-name	Virtual Routing and Forwarding (VRF) name. The maximum size is 32 alphanumeric characters.
----------	--

## Command Default

None

## Command Modes

Global configuration mode  
network-adminnetwork-operatorvdc-admin vdc-operator

## Command History

Release	Modification
6.2(2)	This command was introduced.

## Usage Guidelines

This command does not require a license.

## Examples

This example shows how to display the LISP information for a VRF instance:

```
switch(config)# show lisp ddt vrf 1
switch(config)#
```



# show lisp dynamic-eid

To display the Locator/ID Separation Protocol (LISP) dynamic-endpoint identifiers (EIDs) configured and discovered on a device, use the **show lisp dynamic-eid** command.

**show lisp dynamic-eid [summary] [dynamic-eid-name] [detail]**

## Syntax Description

summary	(Optional) Display a one-line summary of discovered dynamic EIDs.
dynamic-eid-name	(Optional) Displays the LISP dynamic-EID information for a single dynamic EID.
detail	(Optional) Displays the details of all displayed LISP dynamic EIDs.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.
5.0(3.lisp)	This command was modified.

## Usage Guidelines

The displayed output includes the number of roaming dynamic-EIDs configured, associated database-mapping information, and the number of roaming dynamic EIDs.

When you use the summary keyword, a one-line listing appears per discovered dynamic EID. When the dynamic EID name entry is listed, information related to that single entry appears. When you use the detail keyword, a list of discovered roaming EIDs appears.

This command does not require a license.

## Examples

This example shows how to display summary information related to all configured and discovered LISP dynamic EIDs:

```
switch# show lisp dynamic-eid
LISP Dynamic EID Information for VRF "default"
Dynamic-EID name: Darrel
  Database-mapping EID-prefix: 153.16.19.2/32, registering more-specifics
  Locator: 173.8.188.25, priority: 1, weight: 50, local
```

**show lisp dynamic-eid**

```
Locator: 173.8.188.26, priority: 1, weight: 50, local
Map-Server(s): 204.69.200.7
Number of roaming dynamic-EIDs discovered: 0
switch#
```

# show lisp proxy-itr

To display a list of Proxy-ITRs (PITRs) that have been discovered through Map Requests, use the **show lisp proxy-itr** command.

**show lisp proxy-itr** [vrf vrf-name]

## Syntax Description

vrf vrf-name	(Optional) Specifies the virtual routing and forwarding (VRF) instance with which to clear the locator address of the PITR.
--------------	---

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(3.lisp-80)	This command was introduced.

## Usage Guidelines

Because of the unidirectional nature of data flows for Proxy ITRs (PITRs), an xTR never has a map-cache entry that contains locators for PITRs. However, when an xTR receives a Map Request from a PITR for an endpoint identifier to Routing Locator (EID-to-RLOC) mapping resolution, the locator address of the PITR is saved (separately from the map cache) by an xTR. The number of locators currently cached is eight (8).

The **show lisp proxy-itr** command displays the list of PITRs that have been discovered through Map Requests. When you use the vrf keyword, all PITR locators associated with this VRF appears.

This command does not require a license.

## Examples

This example shows how to display a list of PITRs that have been discovered through Map-Requests:

```
switch# show lisp proxy-itr
Discovered Proxy-ITRs (PITRs) in VRF "default"
  10.20.10.60
switch#
```

# show lisp site

To display configured Locator/ID Separation Protocol (LISP) sites on a Map Server, use the show lisp site command.

**show lisp site** [{EID| EID-prefix} [[instance-id iid]] site-name] [vrf vrf-name] [detail]

## Syntax Description

EID	(Optional) Destination endpoint identifier (EID).
EID-prefix	(Optional) Instance id.
instance-id iid	(Optional) Displays LISP site information that matches this destination EID prefix.
site-name	(Optional) Site name.
vrf vrf-name	(Optional) Specifies the virtual routing and forwarding (VRF) instance.
detail	(Optional) Specifies the details of all displayed LISP site information when no other parameters are used.

## Command Default

None

## Command Modes

Any command mode

## Command History

Release	Modification
5.0(1.13)	This command was introduced.

## Usage Guidelines

The displayed output indicates whether a site is actively registered.

This command does not require a license.

## Examples

This example shows how to display the configured LISP sites on a LISP Map Server:

```
switch# show lisp site
LISP Site Registration Information for VRF "default"
* = truncated IPv6 address
Site Name      Last      Actively   Who last      EID-prefix
                Registered Registered Registered
cisco-it-xtr   00:00:47  yes       172.16.81.170 2001:db8:110c::/48
```

```

dmn-xtr-1      00:00:18   yes      172.17.81.170  192.168.5.0/24
               00:00:56   yes      172.30.156.134 2001:db8:1200::/48
               00:00:56   yes      172.31.65.94   192.168.10.0/24
dmn-xtr-2      00:00:48   yes      172.30.156.23  2001:db8:1203::/48
               never     no       --             192.168.12.0/24
switch#
    
```


This example shows how to display detailed information that is related to a LISP site:

```

switch# show lisp site dmn-xtr-1
LISP Site Registration Information for VRF "default"
* = truncated IPv6 address
Site name: "dmn-xtr-1"
Description: none configured
Allowed configured locators: any
Allowed EID-prefixes:
  Configured EID-prefix: 2001:db8:1200::/48, instance-id: 0
  Currently registered: yes
  First registered: 07:54:01
  Last registered: 00:00:10
  Who last registered: 172.30.156.134
  Routing table tag: 0x00000000
  Proxy Replying: no
  Wants Map-Notifications: no
  Registered TTL: 1440 minutes
  Registered locators:
  Registered locators:
    172.30.156.134 (up), priority: 1, weight: 50
    172.31.65.94 (up), priority: 1, weight: 50
  Registration errors:
    Authentication failures: 0
    Allowed locators mismatch: 0
  Configured EID-prefix: 192.168.10.0/24, instance-id: 0
  Currently registered: yes
  First registered: 2w0d
  Last registered: 00:00:36
  Who last registered: 172.30.156.134
  Routing table tag: 0x00000000
  Proxy Replying: no
  Wants Map-Notifications: no
  Registered TTL: 1440 minutes
  Registered locators:
    172.30.156.134 (up), priority: 1, weight: 50
    172.31.65.94 (up), priority: 1, weight: 50
  Registration errors:
    Authentication failures: 0
    Allowed locators mismatch: 0
switch#
    
```

**Related Commands**

Command	Description
show ip lisp	Displays the IPv4 LISP configuration status for the local device.

 show lisp site