LISP Multicast

The LISP Multicast feature introduces support for carrying multicast traffic over a Locator ID Separation Protocol (LISP) overlay. This support currently allows for unicast transport of multicast traffic with head-end replication at the root ingress tunnel router (ITR) site. This allows network operators to use LISP to carry multicast traffic over core networks that do not have native multicast capabilities.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Prerequisites for LISP Multicast

- You must configure basic LISP services on the device. Basic LISP configurations are covered in "Configuring Basic LISP" section of this configuration guide.
• You must configure IPv6 multicast and LISP services on the device. The configuration of IPv6 multicast over LISP is covered in "How to Configure LISP Multicast" and "Example: Configuring IPv6 Multicast over LISP" sections of this guide.

Restrictions for LISP Multicast

• LISP multicast does not support IPv6 endpoint identifiers (EIDs) or IPv6 routing locators (RLOCs). Only IPv4 EIDs and IPv4 RLOCs are supported.
• LISP multicast does not support Dense Mode or Bidirectional Protocol Independent Multicast (PIM). Only PIM-Sparse Mode (SM) and PIM Source Specific Multicast (SSM) modes are supported.
• LISP multicast does not support group to Rendezvous Point (RP) mapping distribution mechanisms, Auto-RP and Bootstrap Router (BSR). Only static-RP configuration is supported.
• LISP multicast does not support LISP Virtual Machine Mobility (VM-Mobility) deployment. That is, LISP multicast cannot be used as a data center interconnect (DCI) mechanism.
• IPv6 LISP multicast does not support IPv6 routing locators. Additionally, it does not support multicast transport.

Note
IPv6 LISP multicast is supported only from Cisco IOS Release 16.2 onwards, though releases earlier than 16.2 supports only IPv4 LISP multicast

Information About LISP Multicast

The implementation of LISP multicast includes the following features:
• Mapping of multicast source addresses as LISP endpoint identifiers (EIDs). (Destination group addresses are not topology dependent).
• Building the multicast distribution tree across LISP overlays.
• Unicast head-end replication of multicast data packets from sources within a root ingress tunnel router (ITR) site to receiver egress tunnel routers (ETRs).
• Support for ASM (Any Source Multicast) and SSM (Source Specific Multicast).
• Support for various combinations of LISP and non-LISP capable source and receiver sites.
• Support for IPv6 endpoint identifiers (EIDs).

Note
If a LISP xTR is also a PIM First Hop Router (FH) or a Rendezvous Point (RP) and the device is only receiving traffic, ensure that at least one interface on the device is covered by a local LISP database mapping. No additional configuration is required to ensure that proper address is selected.
How to Configure LISP Multicast

Configuring LISP Multicast

Perform this task to enable the LISP multicast functionality on the xTR.

Before You Begin

Ensure that generic multicast functionality has been enabled on the required devices of the LISP site and PIM sparse mode has been enabled on the required interfaces of these devices.

SUMMARY STEPS

1. enable
2. configure terminal
3. ip multicast-routing [distributed]
4. Enter one of the following:
   • ip pim rp-address rp-address
   • ip pim ssm {default | range {access-list-number | access-list-name}}
5. interface lisp interface-number
6. ipv6 pim lisp transport [ipv4]
7. ip pim sparse-mode
8. exit
9. interface interface-type interface-number
10. description string
11. ip pim sparse-mode
12. end

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
</tr>
<tr>
<td>enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Device&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
</tr>
<tr>
<td>configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Device# configure terminal</td>
<td></td>
</tr>
</tbody>
</table>
## Configuring LISP Multicast

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 3</strong></td>
<td><code>ip multicast-routing [distributed]</code></td>
<td>Enables IP multicast routing.</td>
</tr>
<tr>
<td>Example:</td>
<td>Device(config)# ip multicast-routing</td>
<td></td>
</tr>
</tbody>
</table>
| **Step 4** | Enter one of the following:  
  - `ip pim rp-address rp-address`  
  - `ip pim ssm {default | range {access-list-number | access-list-name}}` | - Statically configures the address of a Protocol Independent Multicast (PIM) rendezvous point (RP) for multicast groups.  
  - Defines the Source Specific Multicast (SSM) range of IP multicast addresses. |
| Example: | Device(config)# ip pim rp-address 10.1.0.2  
  Device(config)# ip pim ssm default |
| **Step 5** | `interface lisp interface-number` | Selects a LISP interface to configure and enters interface configuration mode. |
| Example: | Device(config)# interface LISP0 |
| **Step 6** | `ipv6 pim lisp transport [ipv4]` | Selects a LISP interface to configure and enters interface configuration mode. |
| Example: | Device(config-if)# ipv6 pim lisp transport unicast ipv4 |
| **Step 7** | `ip pim sparse-mode` | Enables Protocol Independent Multicast (PIM) on an interface for sparse-mode operation. |
| Example: | Device(config-if)# ip pim sparse-mode |
| **Step 8** | `exit` | Exits interface configuration mode and enters global configuration mode. |
| Example: | Device(config-if)# exit |
| **Step 9** | `interface interface-type interface-number` | Configures the LISP interface facing the site and enters interface configuration mode. |
| Example: | Device(config)# interface GigabitEthernet0/0/0 |
### Command or Action | Purpose
--- | ---
**Step 10** | **description** *string*
Example:
Device(config-if)# description Link To Site

Configures a description text for the interface.

**Step 11** | **ip pim sparse-mode**
Example:
Device(config-if)# ip pim sparse-mode

Enables Protocol Independent Multicast (PIM) on an interface for sparse-mode operation.

**Step 12** | **end**
Example:
Device(config-if)# end

Ends the current configuration session and returns to privileged EXEC mode.

---

**Configuring LISP Multicast in VRFs**

Perform this task to enable the LISP multicast functionality on an xTR with Virtual Routing and Forwarding (VRF) mode configured.

**Before You Begin**

Ensure that generic multicast functionality has been enabled on the required devices of the LISP site and that PIM sparse mode has been enabled on the required interfaces of these devices.
SUMMARY STEPS

1. enable
2. configure terminal
3. vrf definition vrf-name
4. address-family ipv4
5. exit
6. exit
7. ip multicast-routing vrf vrf-name [distributed]
8. Enter one of the following:
   • ip pim vrf vrf-name rp-address ip-address
   • ip pim vrf vrf-name ssm {default | range {access-list-number | access-list-name}}
9. interface lisp interface-number
10. ip pim sparse-mode
11. exit
12. interface interface-type interface-number
13. vrf forwarding vrf-name
14. description string
15. ip pim sparse-mode
16. end

DETAILED STEPS

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td>Device&gt; enable</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td>Device# configure terminal</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>vrf definition vrf-name</td>
<td>Configures a virtual routing and forwarding (VRF) routing table instance and enters VRF configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td>Device(config)# vrf definition VRF1</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>address-family ipv4</td>
<td>Configures an address family for the VRF and enters VRF address family configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td>Device(config-vrf)# address-family ipv4</td>
<td></td>
</tr>
<tr>
<td>Step 5</td>
<td>Command or Action</td>
<td>Purpose</td>
</tr>
<tr>
<td>--------</td>
<td>------------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>exit</td>
<td>Exits VRF address family configuration mode and enters VRF configuration mode.</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config-vrf-af)# exit
```

<table>
<thead>
<tr>
<th>Step 6</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>exit</td>
<td>Exits VRF configuration mode and enters global configuration mode.</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config-vrf)# exit
```

<table>
<thead>
<tr>
<th>Step 7</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ip multicast-routing vrf vrf-name [distributed]</td>
<td>Enables IP multicast routing.</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config)# ip multicast-routing vrf VRF1 distributed
```

<table>
<thead>
<tr>
<th>Step 8</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enter one of the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ip pim vrf vrf-name rp-address ip-address</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ip pim vrf vrf-name ssm {default</td>
<td>range {access-list-number</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config)# ip pim vrf VRF1 rp-address 10.1.0.2
```

**Example:**

```
Device(config)# ip pim vrf VRF1 ssm default
```

<table>
<thead>
<tr>
<th>Step 9</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>interface lisp interface-number</td>
<td>Selects a LISP interface to configure and enters interface configuration mode.</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config)# interface lisp 22.10
```

<table>
<thead>
<tr>
<th>Step 10</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ip pim sparse-mode</td>
<td>Enables Protocol Independent Multicast (PIM) on an interface for sparse-mode operation.</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config-if)# ip pim sparse-mode
```

<table>
<thead>
<tr>
<th>Step 11</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>exit</td>
<td>Exits interface configuration mode and enters global configuration mode.</td>
</tr>
</tbody>
</table>

**Example:**

```
Device(config-if)# exit
```
<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 12</strong></td>
<td>interface interface-type interface-number</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device(config)# interface GigabitEthernet0/0/0</td>
</tr>
<tr>
<td><strong>Step 13</strong></td>
<td>vrf forwarding vrf-name</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device(config-if)# vrf forwarding VRF1</td>
</tr>
<tr>
<td><strong>Step 14</strong></td>
<td>description string</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device(config-if)# description Link To Site</td>
</tr>
<tr>
<td><strong>Step 15</strong></td>
<td>ip pim sparse-mode</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device(config-if)# ip pim sparse-mode</td>
</tr>
<tr>
<td><strong>Step 16</strong></td>
<td>end</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device(config-if)# end</td>
</tr>
</tbody>
</table>

### Verifying LISP Multicast

Perform this task to verify the configuration of LISP multicast routes on a device.

**SUMMARY STEPS**

1. `show ip mroute multicast-ip-address`
2. `ping multicast-ip-address`

**DETAILED STEPS**

**Step 1**

`show ip mroute multicast-ip-address`

**Example:**
The following example shows how the IP multicast routing table is displayed using the `show ip mroute` command:

```
Device# show ip mroute 239.4.4.4
```

```
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 239.4.4.4), 00:06:25/00:02:39, RP 10.1.0.2, flags: SJCL
Incoming interface: Serial0/0, RPF nbr 10.1.0.2
Outgoing interface list:
  Loopback2, Forward/Sparse, 00:06:24/00:02:39

(*, 224.0.1.40), 00:06:25/00:02:37, RP 10.1.0.2, flags: SJCL
Incoming interface: Serial0/0, RPF nbr 10.1.0.2
Outgoing interface list:
  Loopback2, Forward/Sparse, 00:06:24/00:02:37
```

### Step 2

**ping multicast-ip-address**

**Example:**

The following example shows how to verify basic multicast network connectivity by pinging the multicast address:

```
Device# ping 239.4.4.4
```

Type escape sequence to abort.
Sending 1, 100-byte ICMP Echos to 239.4.4.4, timeout is 2 seconds:

Reply to request 0 from 192.168.0.1, 15 ms
Reply to request 0 from 10.1.0.2, 58 ms
Reply to request 0 from 10.1.0.2, 58 ms
Reply to request 0 from 10.1.0.1, 35 ms
Reply to request 0 from 10.1.0.2, 34 ms
Reply to request 0 from 10.1.0.1, 15 ms
Configuration Examples for LISP Multicast

Example: Configuring LISP Multicast

The following example shows how to configure LISP Multicast in the topology given below:

Figure 1: LISP Multicast Topology

Router 1

The following example shows how to configure LISP multicast in Router 1:

Device# show startup-config

!
ip multicast-routing

interface Loopback1
ip address 192.168.0.1 255.255.255.255
ip pim sparse-mode
ip igmp join-group 239.4.4.4
serial restart-delay 0

interface Loopback2
ip address 192.168.0.2 255.255.255.255
ip pim sparse-mode
ip igmp join-group 239.4.4.4
serial restart-delay 0
!
interface Loopback3
ip address 192.168.0.3 255.255.255.255
ip pim sparse-mode
ip igmp join-group 239.4.4.4
serial restart-delay 0
!
interface Serial0/0
ip address 10.1.0.1 255.255.255.0
ip pim sparse-mode
serial restart-delay 0
!
router rip
version 2
network 10.0.0.0
gateway 192.168.0.0
default-information originate
!
ip forward-protocol nd
!
ip pim rp-address 10.1.0.2
!
End

The following example shows how to verify the configuration of LISP multicast routes in Router 1:

Device# show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, g - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode
(•, 239.4.4.4), 00:00:49/00:02:16, RP 10.1.0.2, flags: SJCL
Incoming interface: Serial0/0, RPF nbr 10.1.0.2
Outgoing interface list:
Loopback2, Forward/Sparse, 00:00:48/00:02:12

(*, 224.0.1.40), 00:00:49/00:02:11, RP 10.1.0.2, flags: SJCL
Incoming interface: Serial0/0, RPF nbr 10.1.0.2
Outgoing interface list:
Loopback2, Forward/Sparse, 00:00:48/00:02:11

The following example shows how to verify basic multicast network connectivity from Router 1 by pinging
the multicast address:

Device# ping 239.4.4.4
Type escape sequence to abort.
Sending 1, 100-byte ICMP Echos to 239.4.4.4, timeout is 2 seconds:
The following example shows how to configure LISP multicast in xTR1:

Device# show startup-config

!  ip multicast-routing
!  interface LISP0
!     ip pim sparse-mode
!  interface Serial1/0
!     ip address 10.1.0.2 255.255.255.0
!     ip pim sparse-mode
!     serial restart-delay 0
!  interface Serial2/0
!     ip address 10.2.0.1 255.255.255.0
!     serial restart-delay 0
!  router lisp
!     database-mapping 192.168.0.0/24 10.2.0.1 priority 1 weight 100
!     ipv4 itr map-resolver 10.14.0.14
!     ipv4 itr
!     ipv4 etr map-server 10.14.0.14 key password123
!     ipv4 etr
!     exit
!  router rip
!     version 2
!     network 10.0.0.0
!     default-information originate
!  ip pim rp-address 10.1.0.2
!  ip route 0.0.0.0 0.0.0.0 10.2.0.2
!

The following example shows how to configure LISP multicast in Router 2:

Device# show startup-config

!  ip multicast-routing
!  interface Loopback1
!     ip address 192.168.1.1 255.255.255.255
!     ip pim sparse-mode
!     ip igmp join-group 239.4.4.4
!     serial restart-delay 0
!
interface Loopback2
  ip address 192.168.1.2 255.255.255.255
  ip pim sparse-mode
  ip igmp join-group 239.4.4.4
  serial restart-delay 0
!
interface Loopback3
  ip address 192.168.1.3 255.255.255.255
  ip pim sparse-mode
  ip igmp join-group 239.4.4.4
  serial restart-delay 0
!
interface Serial0/0
  ip address 10.4.0.2 255.255.255.0
  ip pim sparse-mode
  serial restart-delay 0
!
router rip
  version 2
  network 10.0.0.0
  network 192.168.1.0
  default-information originate
!
ip forward-protocol nd
!
ip rp-address 10.1.0.2
!
End

The following example shows how to verify the configuration of LISP multicast routes in Router 2:

Device# show ip mroute

IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
N - Received BGP Shared-Tree Prune, n - BGP C-Mroute suppressed,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector, p - PIM Joins on route,
x - VxLAN group
Outgoing interface flags: H - Hardware switched, A - Assert winner, p - PIM Join
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 239.4.4.4), 00:12:59/00:02:01, RP 10.4.0.1, flags: SJCL
Incoming interface: Serial0/0, RPF nbr 10.4.0.1
Outgoing interface list:
  Loopback2, Forward/Sparse, 00:12:58/00:02:01

(*, 224.0.1.40), 00:12:59/00:02:03, RP 10.4.0.1, flags: SJCL
Incoming interface: Serial0/0, RPF nbr 10.4.0.1
Outgoing interface list:
  Loopback2, Forward/Sparse, 00:12:58/00:02:03
The following example shows how to verify basic multicast network connectivity from Router 2 by pinging the multicast address:

```
Device# ping 239.4.4.4
```

Type escape sequence to abort.
Sending 1, 100-byte ICMP Echos to 239.4.4.4, timeout is 2 seconds:

Reply to request 0 from 192.168.1.1, 2 ms
Reply to request 0 from 10.3.0.2, 26 ms
Reply to request 0 from 10.4.0.1, 26 ms
Reply to request 0 from 192.168.1.2, 2 ms
Reply to request 0 from 192.168.1.3, 8 ms
Reply to request 0 from 10.4.0.1, 16 ms
Reply to request 0 from 10.4.0.1, 16 ms
Reply to request 0 from 10.4.0.2, 2 ms

xTR2

The following example shows how to configure LISP multicast in xTR2:

```
Device# show startup-config

! ip multicast-routing
! interface LISP0
  ip pim sparse-mode
!
! interface Serial1/0
  ip address 10.3.0.2 255.255.255.0
  serial restart-delay 0
!
! interface Serial2/0
  ip address 10.4.0.1 255.255.255.0
  ip pim sparse-mode
  serial restart-delay 0
!
! router lisp
  database-mapping 192.168.1.0/24 10.3.0.2 priority 1 weight 100
  ipv4 itr map-resolver 10.14.0.14
  ipv4 itr
  ipv4 etr map-server 10.14.0.14 key Amel
  ipv4 etr
  exit
!
! router rip
  version 2
  network 10.0.0.0
  default-information originate
!
  ip pim rp-address 10.1.0.2
  ip route 0.0.0.0 0.0.0.0 10.3.0.1
!
```

MS/MR

The following example shows how to configure LISP multicast in MS/MR:

```
Device# show startup-config

! ip multicast-routing
!
! interface LISP0
! ip pim sparse-mode
!
! interface Serial1/0
  ip address 10.3.0.2 255.255.255.0
  serial restart-delay 0
!
! interface Serial2/0
  ip address 10.4.0.1 255.255.255.0
  ip pim sparse-mode
  serial restart-delay 0
!
! router lisp
  database-mapping 192.168.1.0/24 10.3.0.2 priority 1 weight 100
  ipv4 itr map-resolver 10.14.0.14
  ipv4 itr
  ipv4 etr map-server 10.14.0.14 key Amel
  ipv4 etr
  exit
!
! router rip
  version 2
  network 10.0.0.0
  default-information originate
!
  ip pim rp-address 10.1.0.2
  ip route 0.0.0.0 0.0.0.0 10.3.0.1
!```
Example: Configuring LISP Multicast in VRFs

The following example shows how to enable and configure a simple LISP site with one IPv4 Routing locator (RLOC) and one IPv4 Endpoint identifier (EID) using xTR, a device which functions both as an Ingress tunnel router (ITR) and an Egress tunnel router (ETR), functionality and using a LISP map server and map resolver for mapping services:

```
Device> enable
Device# configure terminal
Device(config)# vrf definition VRF1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
```

Example: Configuring LISP Multicast in VRFs

The following example shows how to configure LISP multicast in the Core router:

```
Device# show startup-config

! ip multicast-routing
! interface Ethernet0/0
 ip address 10.14.0.1 255.255.255.0
 serial restart-delay 0
! interface Serial1/0
 ip address 10.2.0.2 255.255.255.0
 serial restart-delay 0
! interface Serial2/0
 ip address 10.3.0.1 255.255.255.0
 serial restart-delay 0
!
```

Core

The following example shows how to configure LISP multicast in the Core router:

```
Device# show startup-config

! ip multicast-routing
! interface Ethernet0/0
 ip address 10.14.0.1 255.255.255.0
 serial restart-delay 0
! interface Serial1/0
 ip address 10.2.0.2 255.255.255.0
 serial restart-delay 0
! interface Serial2/0
 ip address 10.3.0.1 255.255.255.0
 serial restart-delay 0
!
```

Example: Configuring LISP Multicast in VRFs

The following example shows how to enable and configure a simple LISP site with one IPv4 Routing locator (RLOC) and one IPv4 Endpoint identifier (EID) using xTR, a device which functions both as an Ingress tunnel router (ITR) and an Egress tunnel router (ETR), functionality and using a LISP map server and map resolver for mapping services:

```
Device> enable
Device# configure terminal
Device(config)# vrf definition VRF1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
```

Example: Configuring LISP Multicast in VRFs

The following example shows how to enable and configure a simple LISP site with one IPv4 Routing locator (RLOC) and one IPv4 Endpoint identifier (EID) using xTR, a device which functions both as an Ingress tunnel router (ITR) and an Egress tunnel router (ETR), functionality and using a LISP map server and map resolver for mapping services:

```
Device> enable
Device# configure terminal
Device(config)# vrf definition VRF1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
```

Example: Configuring LISP Multicast in VRFs

The following example shows how to enable and configure a simple LISP site with one IPv4 Routing locator (RLOC) and one IPv4 Endpoint identifier (EID) using xTR, a device which functions both as an Ingress tunnel router (ITR) and an Egress tunnel router (ETR), functionality and using a LISP map server and map resolver for mapping services:

```
Device> enable
Device# configure terminal
Device(config)# vrf definition VRF1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
```

Example: Configuring LISP Multicast in VRFs

The following example shows how to enable and configure a simple LISP site with one IPv4 Routing locator (RLOC) and one IPv4 Endpoint identifier (EID) using xTR, a device which functions both as an Ingress tunnel router (ITR) and an Egress tunnel router (ETR), functionality and using a LISP map server and map resolver for mapping services:

```
Device> enable
Device# configure terminal
Device(config)# vrf definition VRF1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit
```
Device(config-vrf)# exit
Device(config)# ip multicast-routing vrf VRF1 [distributed]
Device(config)# ip pim vrf VRF1 ssm range LIST1
Device(config)# router lisp 22
Device(config-router-lisp)# eid-table vrf VRF1 instance-id 10
Device(config-router-lisp-eid-table)# database-mapping 198.51.100.0/24 192.0.2.10 priority 1 weight 100
Device(config-router-lisp-eid-table)# exit
Device(config-router-lisp)# ipv4 itr
Device(config-router-lisp)# ipv4 etr
Device(config-router-lisp)# ipv4 itr map-resolver 192.0.2.10
Device(config-router-lisp)# ipv4 etr map-server 192.0.2.10 key 0 some-key
Device(config-router-lisp)# exit
Device(config-if)# ip pim sparse-mode
Device(config-if)# exit
Device(config)# ip route 0.0.0.0 0.0.0.0 192.0.2.20
Device(config)# end

Additional References for LISP Multicast

The following sections provide references related to the Locator ID Separation Protocol.

Related Documents

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Location</th>
</tr>
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<tbody>
<tr>
<td>Cisco IOS commands</td>
<td>Cisco IOS Master Command List, All Releases</td>
</tr>
<tr>
<td>LISP commands</td>
<td>Cisco IOS IP Routing: LISP Command Reference</td>
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Standards

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<th>Standard</th>
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<td>Address family numbers</td>
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MIBs

<table>
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<tr>
<th>MIB</th>
<th>MIBs Link</th>
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<tbody>
<tr>
<td>None</td>
<td>To locate and download MIBs for selected platforms, Cisco IOS software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></td>
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RFCs

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Technical Assistance

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<th>Description</th>
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<tr>
<td>The Cisco Support website provides extensive online resources, including</td>
<td><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></td>
</tr>
<tr>
<td>documentation and tools for troubleshooting and resolving technical issues</td>
<td></td>
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<tr>
<td>with Cisco products and technologies.</td>
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<tr>
<td>To receive security and technical information about your products, you</td>
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<tr>
<td>can subscribe to various services, such as the Product Alert Tool (accessed</td>
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</tr>
<tr>
<td>from Field Notices), the Cisco Technical Services Newsletter, and Really</td>
<td></td>
</tr>
<tr>
<td>Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support</td>
<td></td>
</tr>
<tr>
<td>website requires a Cisco.com user ID and password.</td>
<td></td>
</tr>
</tbody>
</table>

Feature Information for LISP Multicast

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.
Table 1: Feature Information for LISP Multicast

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
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<tbody>
<tr>
<td>LISP Multicast</td>
<td>Cisco IOS XE Release 3.13S</td>
<td>The LISP Multicast feature introduces support for carrying multicast traffic over a Locator ID Separation Protocol (LISP) overlay and allows source multicast sites and receiver multicast sites to send and receive multicast packets over a unicast RLOC core.</td>
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