Redistribution of RIB Routes into LISP

The Redistribution of RIB Routes into LISP feature redistributes routes present in the Routing Information Base (RIB), as available, from Border Gateway Protocol (BGP), Interior Gateway Protocols (IGPs), or static or connected sources, into a Locator ID Separation Protocol (LISP) egress tunnel router (ETR) to define ETR database mappings or into a LISP Proxy ingress tunnel router (PITR) to define PITR map-cache entries.

- Finding Feature Information, page 1
- Information About Redistribution of RIB Routes into LISP, page 1
- How to Configure Redistribution of RIB Routes into LISP, page 2
- Verifying Redistribution of RIB Routes into LISP, page 7
- Configuration Examples for Redistribution of RIB Routes into LISP, page 9
- Additional References for Redistribution of RIB Routes into LISP, page 10
- Feature Information for Redistribution of RIB Routes into LISP, page 11

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.

Information About Redistribution of RIB Routes into LISP

The Redistribution of RIB Routes into LISP feature extends support for the import of Routing Information Base (RIB) routes into Locator ID Separation Protocol (LISP). This feature is based on the RIB route redistribution mechanism and allows LISP to import RIB routes from Border Gateway Protocol (BGP), Interior Gateway Protocols (IGPs), or static or connected sources for use in internal LISP applications.

Currently supported sources are:
How to Configure Redistribution of RIB Routes into LISP

Configuring a Route Import Application

To redistribute Routing Information Base (RIB) routes into Locator ID Separation Protocol (LISP), one or more route import applications can be configured for each endpoint identifier (EID) instance. The currently defined route import applications are map cache and database import.

Note

A limitation in the way redistribution is communicated to the IOS RIB is that a specific RIB producer protocol cannot be used for both database and map-cache route-import applications under a specific EID table. However, database and map-cache route-import applications can still be enabled in the same EID table but for different RIB producer protocols.

Configuring a Route Import Map-Cache Application

Perform this task to configure the import of routes from the Routing Information Base (RIB) to define endpoint identifier (EID) space on an ingress tunnel router (ITR) or Proxy ingress tunnel router (PITR).

Before You Begin

When you use endpoint identifier (EID) virtualization within Locator ID Separation Protocol (LISP), you must create a VRF using the vrf definition command and enable at least one address family within the VRF. In addition, you must define the LISP instance ID to which the VRF is associated. LISP virtualization options and configurations are covered in the "LISP Shared Model" and "LISP Parallel Model Virtualization" sections of this configuration guide.

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bgp</td>
<td>Border Gateway Protocol (BGP)</td>
</tr>
<tr>
<td>connected</td>
<td>Connected</td>
</tr>
<tr>
<td>eigrp</td>
<td>Enhanced Interior Gateway Routing Protocol (EIGRP)</td>
</tr>
<tr>
<td>isis</td>
<td>ISO IS-IS</td>
</tr>
<tr>
<td>ospf</td>
<td>Open Shortest Path First (OSPF)</td>
</tr>
<tr>
<td>ospfv3</td>
<td>OSPFv3</td>
</tr>
<tr>
<td>rip</td>
<td>Routing Information Protocol (RIP)</td>
</tr>
<tr>
<td>static</td>
<td>Static routes</td>
</tr>
</tbody>
</table>
By default, LISP considers EID prefixes to be available in the default RIB. For default (non-virtualized) LISP configurations, VRF definition is not required prior to LISP configuration.

**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **router lisp** \([\text{lisp-instantiation-number}]\)
4. **eid-table vrf** \(\text{vrf-name instance-id iid}\)
5. \{ipv4 | ipv6\} **route-import map-cache protocol autonomous-system-number** \([\text{route-map map-name}]\)
6. **end**

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example: Device&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example: Device# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> router lisp ([\text{lisp-instantiation-number}])</td>
<td>Creates the specified LISP instantiation number and enters LISP configuration mode. All subsequent LISP commands apply to that router LISP instantiation.</td>
</tr>
<tr>
<td>Example: Device(config)# router lisp 22</td>
<td></td>
</tr>
<tr>
<td><strong>Note</strong> The use of the <strong>lisp-instantiation-number</strong> argument is optional. This argument is used when LISP parallel model virtualization is configured.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> eid-table vrf vrf-name instance-id iid</td>
<td>Configures a LISP instance ID for association with a VRF table or default table through which the EID address space is reachable and enters LISP eid-table configuration mode.</td>
</tr>
<tr>
<td>Example: Device(config-router-lisp)# eid-table vrf VRF1 instance-id 10</td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong> {ipv4</td>
<td>ipv6} <strong>route-import map-cache protocol autonomous-system-number</strong> ([\text{route-map map-name}])</td>
</tr>
<tr>
<td>Example: Device(config-router-lisp-eid-table)# ipv4 route-import map-cache eigrp 19 route-map abcd</td>
<td>• (Optional) The <strong>route-map</strong> keyword specifies that imported IPv4 prefixes should be filtered according to the specified route-map name.</td>
</tr>
</tbody>
</table>
### Configuring a Route Import Database Application

Perform this task to configure the import of Routing Information Base (RIB) routes to define local endpoint identifier (EID) prefixes and associate them with a specified locator set.

**Before You Begin**

When you use endpoint identifier (EID) virtualization within Locator ID Separation Protocol (LISP), you must create a VRF using the `vrf definition` command and enable at least one address family within the VRF. In addition, you must define the LISP instance ID to which the VRF is associated. LISP virtualization options and configurations are covered in the "LISP Shared Model" and "LISP Parallel Model Virtualization" sections of this configuration guide.

**Note**

By default, LISP considers EID prefixes to be available in the default RIB. For default (non-virtualized) LISP configurations, VRF definition is not required prior to LISP configuration.

**SUMMARY STEPS**

1. `enable`
2. `configure terminal`
3. `router lisp [lisp-instantiation-number]`
4. `locator-set set`
5. `{ipv4-interface if-name | ipv6-interface if-name | ipv4-address | ipv6-address} priority priority weight weight`
6. `exit`
7. `eid-table vrf vrf-name instance-id iid`
8. `{ipv4 | ipv6} route-import database protocol autonomous-system-number [route-map map-name] locator-set locator-set-name`
9. `end`
**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1** ENABLE privileged EXEC mode.  
(enable)  
Example:  
Device> enable | Enables privileged EXEC mode. |
| **Step 2** ENTERS global configuration mode.  
(configure)  
Example:  
Device# configure terminal | Enters global configuration mode. |
| **Step 3** CREATES the specified LISP instantiation number and enters LISP configuration mode. All subsequent LISP commands apply to that router LISP instantiation.  
(router lisp [lisp-instantiation-number])  
Example:  
Device(config)# router lisp 15 | Creates the specified LISP instantiation number and enters LISP configuration mode. All subsequent LISP commands apply to that router LISP instantiation. Note: The use of the *lisp-instantiation-number* argument is optional. This argument is used when LISP parallel model virtualization is configured. |
| **Step 4** SPECIFIES a locator set and enters LISP locator-set configuration mode.  
(locator-set set)  
Example:  
Device(config-router-lisp)# locator-set ABC | Specifies a locator set and enters LISP locator-set configuration mode. |
| **Step 5** USES IPv4 address of interface as locator.  
(ipv4-interface if-name | ipv6-interface if-name | ipv4-address | ipv6-address) priority priority weight weight  
Example:  
Device(config-router-lisp-locator-set)# ipv4-interface GigabitEthernet0/0 priority 5 weight 10 | Uses IPv4 address of interface as locator. |
| **Step 6** EXITS LISP locator-set configuration mode and enters LISP configuration mode.  
(exit)  
Example:  
Device(config-router-lisp-locator-set)# exit | Exits LISP locator-set configuration mode and enters LISP configuration mode. |
| **Step 7** CONFIGURES a LISP instance ID for association with a VRF table or default table through which the EID address space is reachable and enters LISP eid-table configuration mode.  
(eid-table vrf vrf-name instance-id iid)  
Example:  
Device(config-router-lisp)# eid-table vrf VRF1 instance-id 10 | Configures a LISP instance ID for association with a VRF table or default table through which the EID address space is reachable and enters LISP eid-table configuration mode. |
| **Step 8** CONFIGURES the import of RIB routes to define local EID prefixes and associates them with the specified locator set.  
Example:  
Device(config-router-lisp-eid-table)# ipv4 route-import database bgp 22 route-map abc locator-set ABC | Configures the import of RIB routes to define local EID prefixes and associates them with the specified locator set.  
- (Optional) The *route-map* keyword specifies that imported IP prefixes should be filtered according to the specified route-map name. |
Purpose

Command or Action | Purpose
--- | ---
**Step 9** | end
*Example:* Device(config-router-lisp-eid-table)# end
Ends the current configuration session and returns to privileged EXEC mode.

---

### Configuring the Number of Routes to Be Imported for Each Application

Perform this task to specify a limit to the number of routes that will be imported to either create local endpoint identifier (EID) database prefixes or remote EID map-cache entries.

**SUMMARY STEPS**

1. enable
2. configure terminal
3. router lisp \([lisp-instantiation-number]\)
4. eid-table vrf vrf-name instance-id iid
5. \{ipv4 | ipv6\} route-import \{map-cache | database\} maximum-prefix limit \[warning-threshold\] [warning-only]
6. end

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1** | enable
*Example:* Device> enable
Enables privileged EXEC mode. |
| **Step 2** | configure terminal
*Example:* Device# configure terminal
Enters global configuration mode. |
| **Step 3** | router lisp \([lisp-instantiation-number]\)
*Example:* Device(config)# router lisp 22
Creates the specified LISP instantiation number and enters LISP configuration mode. All subsequent LISP commands apply to that router LISP instantiation.
*Note* The use of the \(lisp-instantiation-number\) argument is optional. This argument is used when LISP parallel model virtualization is configured. |
| **Step 4** | eid-table vrf vrf-name instance-id iid
*Example:* Device(config-router-lisp)# eid-table vrf VRF100 instance-id 10
Configures a LISP instance ID for association with a VRF table or default table through which the EID address space is reachable and enters LISP eid-table configuration mode. |
<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 5</td>
<td>{ipv4</td>
</tr>
<tr>
<td>Example:</td>
<td>Device(config-router-lisp-eid-table)# ipv4 route-import database maximum-prefix 45 15 warning-only</td>
</tr>
</tbody>
</table>

| Step 6 | end | Ends the current configuration session and returns to privileged EXEC mode. |
| Example: | Device(config-router-lisp)# end |

## Verifying Redistribution of RIB Routes into LISP

Perform this task to verify the configuration of the Redistribution of RIB Routes into LISP feature. The **show** commands can be entered in any order.

### SUMMARY STEPS

1. `show ip lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv4-address | ipv4-prefix]`
2. `show ip lisp [lisp-instantiation-number] [instance-id iid] route-import map-cache [ipv4-address | ipv4-prefix]`
3. `show ipv6 lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv6-address | ipv6-prefix]`
4. `show ipv6 lisp [lisp-instantiation-number] [instance-id iid] route-import map-cache [ipv6-address | ipv6-prefix]`

### DETAILED STEPS

**Step 1**

`show ip lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv4-address | ipv4-prefix]`

**Example:**

The following example displays the current IPv4 Routing Information Base (RIB) routes imported into Locator ID Separation Protocol (LISP) to define local endpoint identifier (EID) database entries:

```
Device# show ip lisp route-import database
LISP IPv4 imported routes for EID-table default (IID 0)
Config: 1, Entries: 8 (limit 1000)
Prefix  Uptime   Source  Map-cache  State
10.1.0.0/16 00:07:52 ospf 10 installed
10.10.1.0/24 00:14:02 ospf 10 installed
10.10.2.0/24 00:14:02 ospf 10 installed
10.10.3.0/24 00:14:02 ospf 10 installed
```

---

**Redistribution of RIB Routes into LISP**

Verifying Redistribution of RIB Routes into LISP

Perform this task to verify the configuration of the Redistribution of RIB Routes into LISP feature. The **show** commands can be entered in any order.

### SUMMARY STEPS

1. `show ip lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv4-address | ipv4-prefix]`
2. `show ip lisp [lisp-instantiation-number] [instance-id iid] route-import map-cache [ipv4-address | ipv4-prefix]`
3. `show ipv6 lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv6-address | ipv6-prefix]`
4. `show ipv6 lisp [lisp-instantiation-number] [instance-id iid] route-import map-cache [ipv6-address | ipv6-prefix]`

### DETAILED STEPS

**Step 1**

`show ip lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv4-address | ipv4-prefix]`

**Example:**

The following example displays the current IPv4 Routing Information Base (RIB) routes imported into Locator ID Separation Protocol (LISP) to define local endpoint identifier (EID) database entries:

```
Device# show ip lisp route-import database
LISP IPv4 imported routes for EID-table default (IID 0)
Config: 1, Entries: 8 (limit 1000)
Prefix  Uptime   Source  Map-cache  State
10.1.0.0/16 00:07:52 ospf 10 installed
10.10.1.0/24 00:14:02 ospf 10 installed
10.10.2.0/24 00:14:02 ospf 10 installed
10.10.3.0/24 00:14:02 ospf 10 installed
```
Step 2

show ip lisp [lisp-instantiation-number] [instance-id iid] route-import map-cache [ipv4-address | ipv4-prefix]

Example:
The following example displays the current IPv4 RIB routes imported into LISP to define local EID map-cache entries:

Device# show ip lisp route-import map-cache
LISP IPv4 imported routes for EID-table default (IID 0)
Config: 1, Entries: 6 (limit 1000)
Prefix  Uptime  Source  Map-cache  State
10.1.0.0/16 00:07:52 bgp 64496 installed
10.2.0.0/16 00:21:31 bgp 64496 installed
10.3.0.0/16 00:21:31 bgp 64496 installed
10.4.0.0/16 00:21:31 bgp 64496 installed
172.16.1.0/24 00:11:52 bgp 64496 installed
192.168.20.0/24 00:11:52 bgp 64496 installed

Step 3

show ipv6 lisp [lisp-instantiation-number] [instance-id iid] route-import database [ipv6-address | ipv6-prefix]

Example:
The following example displays the current IPv6 RIB routes imported into LISP to define local EID database entries:

Device# show ipv6 lisp route-import database
LISP IPv6 imported routes for EID-table default (IID 0)
Config: 1, Entries: 4 (limit 1000)
Prefix  Uptime  Source  Map-cache  State
2001:db8:10:1::/64 00:56:26 ospf 10 installed
2001:db8:ab:cd:1::/80 00:17:52 ospf 10 installed
2001:db8:ab:cd:2::/80 00:17:52 ospf 10 installed
2001:db8:ab:cd:3::/80 00:17:52 ospf 10 installed

Step 4

show ipv6 lisp [lisp-instantiation-number] [instance-id iid] route-import map-cache [ipv6-address | ipv6-prefix]

Example:
The following example displays the current IPv6 RIB routes imported into LISP to define local EID map-cache entries:

Device# show ipv6 lisp route-import map-cache
LISP IPv6 imported routes for EID-table default (IID 0)
Config: 1, Entries: 4 (limit 1000)
Prefix  Uptime  Source  Map-cache  State
2001:db8:ab:cd:4::/64 00:19:50 bgp 64496 installed
2001:db8:cd::/48 00:25:32 bgp 64496 installed
2001:db8:ce::/48 00:27:11 bgp 64496 installed
2001:db8:cf::/48 00:12:12 bgp 64496 installed
Configuration Examples for Redistribution of RIB Routes into LISP

Examples: Configuring a Route Import Application

Example: Configuring a Route Import Map-Cache Application

The following example shows how to configure the import of routes from the Routing Information Base (RIB) to define endpoint identifier (EID) space on an ingress tunnel router (ITR) or Proxy ingress tunnel router (PITR):

```
Device> enable
Device# configure terminal
Device(config)# router lisp 23
Device(config-router-lisp)# eid-table vrf VRF1 instance-id 10
Device(config-router-lisp-eid-table)# ipv4 route-import map-cache bgp 10 route-map abcd
Device(config-router-lisp)# end
```

Example: Configuring a Route Import Database Application

The following example shows how to configure the import of Routing Information Base (RIB) routes to define local endpoint identifier (EID) prefixes and associate them with a specified locator set:

```
Device> enable
Device# configure terminal
Device(config)# router lisp 23
Device(config-router-lisp)# locator-set ABC
Device(config-router-lisp)# ipv4-interface GigabitEthernet0/0 priority 5 weight 10
Device(config-router-lisp-locator-set)# exit
Device(config-router-lisp)# eid-table vrf VRF1 instance-id 10
Device(config-router-lisp-eid-table)# ipv4 route-import database bgp 22 route-map abcd locator-set ABC
Device(config-router-lisp)# end
```

Example: Configuring the Number of Routes to Be Imported for Each Application

The following example shows how to specify a limit to the number of routes that will be imported to either create local endpoint identifier (EID) database prefixes or remote EID map-cache entries:

```
Device> enable
Device# configure terminal
Device(config)# router lisp 23
Device(config-router-lisp)# eid-table vrf VRF100 instance-id 10
Device(config-router-lisp)# ipv4 route-import database maximum-prefix 30 15 warning-only
Device(config-router-lisp)# end
```
# Additional References for Redistribution of RIB Routes into LISP

## Related Documents

<table>
<thead>
<tr>
<th>Related Topic</th>
<th>Document Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS commands</td>
<td>Cisco IOS Master Command List, All Releases</td>
</tr>
<tr>
<td>Locator/ID Separation Protocol (LISP) commands</td>
<td>Cisco IOS IP Routing: LISP Command Reference</td>
</tr>
</tbody>
</table>

## Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>IANA Address Family Numbers</td>
<td><a href="http://www.iana.org/assignments/address-family-numbers/address-family-numbers.xml">http://www.iana.org/assignments/address-family-numbers/address-family-numbers.xml</a></td>
</tr>
</tbody>
</table>

## MIBs

<table>
<thead>
<tr>
<th>MIB</th>
<th>MIBs Link</th>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>

## RFCs

<table>
<thead>
<tr>
<th>RFC</th>
<th>Title</th>
</tr>
</thead>
</table>
Technical Assistance

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

Feature Information for Redistribution of RIB Routes into LISP

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. An account on Cisco.com is not required.
### Table 1: Feature Information for Redistribution of RIB Routes into LISP

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redistribution of RIB Routes</td>
<td>15.4(2)T</td>
<td>The Redistribution of RIB Routes into LISP feature redistributes routes present in the Routing Information Base (RIB), as available, from Border Gateway Protocol (BGP), Interior Gateway Protocols (IGPs), or static or connected sources, into a Locator ID Separation Protocol (LISP) egress tunnel router (ETR) to define ETR database mappings or into a LISP Proxy ingress tunnel router (PITR) to define PITR map-cache entries. The following commands were introduced or modified: <code>ipv4 route-import maximum-prefix</code>, <code>ipv6 route-import maximum-prefix</code>, <code>ipv4 route-import database</code>, <code>ipv6 route-import database</code>, <code>ipv4 route-import map-cache</code>, <code>ipv6 route-import map-cache</code>, <code>show ip lisp route-import database</code>, <code>show ipv6 lisp route-import database</code>, <code>show ip lisp route-import map-cache</code>, and <code>show ipv6 lisp route-import map-cache</code>.</td>
</tr>
</tbody>
</table>

The following commands were introduced or modified: `ipv4 route-import maximum-prefix`, `ipv6 route-import maximum-prefix`, `ipv4 route-import database`, `ipv6 route-import database`, `ipv4 route-import map-cache`, `ipv6 route-import map-cache`, `show ip lisp route-import database`, `show ipv6 lisp route-import database`, `show ip lisp route-import map-cache`, and `show ipv6 lisp route-import map-cache`. |