IS-IS IPv6 Multi-Process Support

The IS-IS IPv6 Multi-Process Support feature enables support for mutual redistribution of IPv6 routes between multiple IS-IS IPv6 instances and allows the IS-IS IPv6 instances to install routes in non-default virtual routing and forwarding (VRF) instances.

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 at the end of this module.

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 IS-IS IPv6 Multi-Process Support

- You must enable IPv6 unicast routing before ISIS IPv6 configuration.
- You must enable IPv6 on an interface, by assigning an IPv6 address to the interface or by using the **ipv6 enable** command, before associating the interface with an ISIS IPv6 instance.
- You must define a virtual routing and forwarding (VRF) and enable an IPv6 address family in the VRF before associating an ISIS IPv6 instance with that VRF.

Information About IS-IS IPv6 Multi-Process Support

IS-IS IPv6 Multi-Process Support Overview

The IS-IS IPv6 Multi-Process Support feature allows you to create up to 28 IPv6-enabled IS-IS instances and enables these IPv6 instances to be associated with any VRF and not only the default VRF. The device can redistribute IPv6 routes between multiple IPv6 IS-IS instances in the same VRF including the default VRF. The device can also redistribute routes between an IS-IS instance and other routing protocols such as RIP and OSPFv3 operating in the same VRF, including routing protocols in the default VRF.

How to Configure IS-IS IPv6 Multi-Process Support

Configuring IS-IS IPv6 Multi-Process Support

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vrf definition** *vrf-name*
4. **address-family ipv6** [**unicast**]
5. **exit**
6. **exit**
7. **interface** *type number*
8. (Optional) **vrf forwarding** *vrf-name*
9. **ipv6 address** *ipv6-prefix/prefix-length*
10. **ipv6 router isis** *process-tag*
11. **exit**
12. Repeat Step 7 to Step 11 to configure IS-IS routing process and VRFs for IPv6 on different interfaces.
13. **router isis** *process-tag*
14. (Optional) **vrf** *vrf-name*
15. **net** *network-entity-title*
16. **is-type** [**level-1** | **level-1-2** | **level-2-only**]
17. **log-adjacency-changes**
18. **address-family ipv6** [**unicast**]
19. **redistribute source-protocol** [*process-id*] [**route-map** *map-tag*]
20. **redistribute isis** [*process-id*] {**level-1** | **level-2**} **into** {**level-1** | **level-2**} **distribute-list** *list-name*
21. **exit**
22. **exit**
23. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
24. **match route-type** {**level-1** | **level-2**}
25. **set metric** *metric-value*
26. **set level** {**level-1** | **level-2** | **level-1-2**}
27. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Device> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**vrf definition** *vrf-name* **Example:** `Device(config)# vrf definition v1`	Configure a virtual routing and forwarding (VRF) routing table instance and enters VRF configuration mode
Step 4	**address-family ipv6** [**unicast**] **Example:** `Device(config-vrf)# address-family ipv6`	Specifies the IPv6 address family, and enters address family configuration mode. **Note** The **unicast** keyword specifies the unicast IPv6 unicast address family. By default, the device is placed in configuration mode for the unicast IPv6 address family if the unicast keyword is not specified with the **address-family ipv6** command.
Step 5	**exit** **Example:** `Device(config-vrf-af)# exit`	Exits the address family configuration mode and enters VRF configuration mode.
Step 6	**exit** **Example:** `Device(config-vrf)# exit`	Exits the VRF configuration mode and enters global configuration mode.
Step 7	**interface** *type number* **Example:** `Device(config)# interface FastEthernet 0/2`	Configures an interface type and enters interface configuration mode.
Step 8	**vrf forwarding** *vrf-name* **Example:** `Device(config-if)# vrf forwarding v1`	(Optional) Associates a Virtual Routing and Forwarding (VRF) or a virtual network with an interface or subinterface

	Command or Action	Purpose
Step 9	**ipv6 address** *ipv6-prefix/prefix-length* **Example:** `Device(config-if)# ipv6 address 2001:DB8::/32`	Sets an IPv6 address for an interface.
Step 10	**ipv6 router isis** *process-tag* **Example:** `Device(config-if)# ipv6 router isis v1a`	Configures an IS-IS routing process for IPv6 on an interface and attaches a tag to the routing process. **Note** The configuration of the interface-mode **ipv6 router isis** command will overwrite the prior configuration on that interface, but only if the new configuration is attempting to change the interface ownership to a different instance that is in the same VRF as the currently configured owner instance. The configuration will be rejected if the attempted change is between two instances that are associated with different VRFs.
Step 11	**exit** **Example:** `Device(config-if)# exit`	Exits the interface configuration mode and enters global configuration mode.
Step 12	Repeat Step 7 to Step 11 to configure IS-IS routing process and VRFs for IPv6 on different interfaces. **Example:**	--
Step 13	**router isis** *process-tag* **Example:** `Device(config)# router isis v1a`	Enables IS-IS for the specified IS-IS routing process, and enters router configuration mode.
Step 14	**vrf** *vrf-name* **Example:** `Device(config-if)# vrf v1`	(Optional) Associates a Virtual Routing and Forwarding (VRF) instance or a virtual network with an interface or subinterface
Step 15	**net** *network-entity-title* **Example:** `Device(config-router)# net 49.000b.0000.0001.0002.00`	Configures IS-IS network entity title (NET) for a CLNS routing process.

	Command or Action	Purpose
Step 16	**is-type** [**level-1** | **level-1-2** | **level-2-only**] **Example:** `Device(config-router)# is-type level-1`	Configures the routing level for an instance of the IS-IS routing process.
Step 17	**log-adjacency-changes** **Example:** `Device(config-router)# log-adjacency-changes`	Configure the device to send a syslog message when an Open Shortest Path First (OSPF) neighbor goes up or down.
Step 18	**address-family ipv6** [**unicast**] **Example:** `Device(config-router)# address-family ipv6`	Specifies the IPv6 address family, and enters address family configuration mode. **Note** The **unicast** keyword specifies the unicast IPv6 unicast address family. By default, the device is placed in configuration mode for the unicast IPv6 address family if the unicast keyword is not specified with the **address-family ipv6** command.
Step 19	**redistribute source-protocol** [*process-id*] [**route-map** *map-tag*] **Example:** `Device(config-router-af)# redistribute isis v1a route-map abc`	Specifies the route map that should be checked to filter the importation of routes from this source routing protocol to the current routing protocol.
Step 20	**redistribute isis** [*process-id*] {**level-1** | **level-2**} **into** {**level-1** | **level-2**} **distribute-list** *list-name* **Example:** `Device(config-router-af)# redistribute isis level-1 into level-2 distribute-list xyz`	Redistributes IPv6 routes from one IS-IS level into another IS-IS level. By default, the routes learned by Level 1 instances are redistributed by the Level 2 instance.
Step 21	**exit** **Example:** `Device(config-router-af)# exit`	Exits the address family configuration mode and enters router configuration mode.
Step 22	**exit** **Example:** `Device(config-router)# exit`	Exits the router configuration mode and enters global configuration mode.

	Command or Action	Purpose
Step 23	**route-map** *map-tag* [**permit** | **deny**] [*sequence-number*] **Example:** `Device(config)# route-map abc permit 10`	Defines the conditions for redistributing routes from one routing protocol into another or from one IS-IS level to another and enters route-map configuration mode.
Step 24	**match route-type** {**level-1** | **level-2**} **Example:** `Device(config-route-map)# match route-type level-1`	Defines the route-type match criterion.
Step 25	**set metric** *metric-value* **Example:** `Device(config-route-map)# set metric 56`	Configures the metric value used to redistribute routes.
Step 26	**set level** {**level-1** | **level-2** | **level-1-2**} **Example:** `Device(config-route-map)# set level level-2`	Specifies the routing level of routes to be advertised into a specified area of the routing domain.
Step 27	**end** **Example:** `Device(config-route-map)# end`	Exits the route-map configuration mode and enters privileged EXEC mode.

Configuration Examples for IS-IS IPv6 Multi-Process Support

Example: IS-IS IPv6 Multi-Process Support Configuration

```
Device> enable
Device# configure terminal
Device(config)# vrf definition v1
Device(config-vrf)# address-family ipv6
Device(config-router-af)# exit
Device(config-router)# exit
Device(config)# interface FastEthernet 0/2
Device(config-if)# ipv6 address 2001:DB8::/32
Device(config-if)# vrf forwarding v1
Device(config-if)# ipv6 router isis v1a
Device(config-if)# exit
Device(config)# interface FastEthernet 0/3
Device(config-if)# ipv6 address 2001:DB8::/48
```

```
Device(config-if)# vrf forwarding v1
Device(config-if)# ipv6 router isis v1b
Device(config-if)# exit
Device(config)# router isis v1a
Device(config-router)# vrf v1
Device(config-router)# net 49.000b.0000.0001.0002.00
Device(config-router)# is-type level-1
Device(config-router)# log-adjacency-changes
Device(config-router)# address-family ipv6
Device(config-router-af)# redistribute isis v1b route-map abc
Device(config-router-af)# redistribute isis level-1 into level-2 distribute-list xyz
Device(config-router-af)# exit
Device(config-router)# exit
Device(config)# router isis v1b
Device(config-router)# vrf v1
Device(config-router)# net 49.000b.0000.000a.0001.00
Device(config-router)# log-adjacency-changes
Device(config-router)# address-family ipv6
Device(config-router-af)# redistribute isis v1a route-map abc
Device(config-router-af)# exit
Device(config-router)# exit
Device(config)# route-map abc permit 10
Device(config-route-map)# match route-type level-1
Device(config-route-map)# set metric 56
Device(config-route-map)# set level level-2
```

Additional References for IS-IS IPv6 Multi-Process Support

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases

Technical Assistance

Description	Link
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.	http://www.cisco.com/support

Feature Information for IS-IS IPv6 Multi-Process Support

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 IS-IS IPv6 Multi-Process Support

Feature Name	Releases	Feature Information
IS-IS IPv6 Multi-Process Support	Cisco IOS XE Release 3.14S	The IS-IS IPv6 Multi-Process Support feature enables support for mutual redistribution of IPv6 routes between multiple IS-IS IPv6 instances and allows the IS-IS IPv6 instances to install routes in non-default virtual routing and forwarding (VRF) instances. No new commands were introduced or modified.