



Segment Routing—IS-IS v4 node SID

The Segment Routing—ISIS v4 node SID feature provides support for segment routing on Cisco Intermediate System-to-Intermediate System (IS-IS) networks.

- [Information About Segment Routing IS-IS v4 Node](#), page 1
- [How to Configure Segment Routing —IS-IS v4 node SID](#), page 1
- [Configuration Examples for Segment Routing —IS-IS v4 node SID](#), page 6
- [Additional References](#), page 7
- [Feature Information for Segment Routing—IS-IS v4 node SID](#), page 8

Information About Segment Routing IS-IS v4 Node

Segment Routing IS-IS v4 node SID

Segment Routing (SR) is a technique by which the path followed by a packet is encoded in the packet itself. The path followed by a packet in segment routing is encoded in the packet itself similar to loose or strict source routing. Segment Routing relies on a small number of extensions to Cisco Intermediate System-to-Intermediate System (IS-IS) and Open Shortest Path First (OSPF) protocols.

How to Configure Segment Routing —IS-IS v4 node SID

Configuring Segment Routing

Before You Begin

Before configuring IS-IS to support segment routing you must first configure the segment routing feature in global configuration mode.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. `segment-routing mpls`
4. `connected-prefix-sid-map`
5. `address-family ipv4`
6. `1.1.1.1/32 100`

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device# enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	<code>segment-routing mpls</code> Example: Device(config-sr)# segment-routing mpls	Enables the segment feature using the mpls data plane.
Step 4	<code>connected-prefix-sid-map</code> Example: Device(config-srmppls)# connected-prefix-sid-map	Enters a sub-mode where you can configure address-family specific mappings for local prefixes and SIDs.
Step 5	<code>address-family ipv4</code> Example: Device(config-srmppls-conn)# address-family 1.1.1.1/32 100 range 1	Specifies IP Version 4 address prefixes.
Step 6	<code>1.1.1.1/32 100</code> Example: Device(config-srmppls-conn-af)# 1.1.1.1/32 100	Associates SID 100 w the address 1.1.1.1/32.

Configuring Segment Routing on IS-IS Network

Before You Begin

Before you configure segment routing on IS-IS network, IS-IS must be enabled on your network.

SUMMARY STEPS

1. router isis
2. net network-entity-title
3. metric-style wide
4. **segment-routing mpls**
5. exit
6. show isis segment-routing state

DETAILED STEPS

	Command or Action	Purpose
Step 1	router isis Example: Device(config-if)# router isis	Enables the IS-IS routing protocol and enters router configuration mode.
Step 2	net network-entity-title Example: Device(config-router)# net 49.0000.0000.0003.00	Configures network entity titles (NETs) for the routing instance.
Step 3	metric-style wide Example: Device(config-router)# metric-style wide	Configures the device to generate and accept only wide link metrics.
Step 4	segment-routing mpls Example: Device(config-router)# segment-routing mpls	Configures segment routing operation state.
Step 5	exit Example: Device(config-router)# exit	Exits segment routing mode and returns to the configuration terminal mode.

	Command or Action	Purpose
Step 6	show isis segment-routing state Example: Device# show is-is segment-routing state	(Optional) Displays the current state of the IS-IS segment routing.

The following example displays output from the show isis segment-routing state command for the segment routing under IS-IS:

```
Device# show isis segment-routing

ISIS protocol is registered with MFI
ISIS MFI Client ID:0x63
Tag 1 - Segment-Routing:
  SR State:SR_ENABLED
  Number of SRGB:1
  SRGB Start:16000, Range:8000, srgb_handle:0x4500AED0, srgb_state: created
  Address-family IPv4 unicast SR is configured
  Operational state:Enabled
```

Configuring Prefix-SID for IS-IS

This task explains how to configure prefix segment identifier (SID) index under each interface.

Before You Begin

Segment routing must be enabled on the corresponding address family.

SUMMARY STEPS

1. enable
2. configure terminal
3. interface Loopback *interface-instanceinterface-type*
4. address-family { ipv4 | ipv6 } [unicast]
5. prefix-sid index *index-value* [n-flag-clearlevel] [explicit-null]
6. exit

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device# enable	Enables privileged EXEC mode.

	Command or Action	Purpose
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface Loopback <i>interface-instance</i> <i>interface-type</i> Example: Device(config)# interface loopback0 passive	Specifies the interface loopback and interface type.
Step 4	address-family { ipv4 ipv6 } [unicast] Example: Device(config-if)# address-family ipv4 unicast	Specifies the IPv4 or IPv6 address family, and enters router address family configuration mode.
Step 5	prefix-sid index <i>index-value</i> [n-flag-clearlevel] [explicit-null] Example: Device(config-if-af)# prefix-sid index 1001 [n-flag-clear] [explicit-null]	Configures the prefix-SID index for the interface.
Step 6	exit Example: Device(config-router)# exit	Exits segment routing mode and returns to the configuration terminal mode.

Configuring Prefix Attribute N-flag-clear

By default, a flag called N-flag is set by IS-IS when advertising a SID which is associated with a loopback address. If you wish to clear this flag add explicit configuration.

SUMMARY STEPS

1. enable
2. configure terminal
3. interface loopback0
4. isis prefix-attributes n-flag-clear {Level-1|Level-2}

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device# enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface loopback0 Example: Device(config)# interface loopback0	Enters interface configuration sub-mode.
Step 4	isis prefix-attributes n-flag-clear {Level-1 Level-2} Example: Device(config-if)# isis prefix-attributes n-flag-clear level-1	Clears the prefix-SID attribute N-flag explicitly.

Configuration Examples for Segment Routing —IS-IS v4 node SID

Example: Configuring Segment Routing on IS-IS Network

The following example shows how to configure segment routing under non-default SRGB mode:

```
enable
configure terminal
  segment-routing mpls
  global-block 20000 24999
  !
  connected-prefix-sid-map
  address-family ipv4
    1.1.1.1/32 100 range 1
  exit-address-family
  !
router isis
net 49.1111.1111.1111.00
metric-style wide
segment-routing mpls
```

Example: Configuring Prefix Attribute N-Flag-Clear

The following is an example for configuring prefix attribute n-flag-clear for interface loopback3:

```
Device(config)# interface loopback3
Device(config-if)# isis prefix n-flag-clear Clear N-flag
Device(config-if)# isis prefix n-flag-clear
Device(config-if)# isis prefix n-flag-clear
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/mcl/allreleasemcl/all-book.html
IP Routing ISIS commands	Cisco IOS IP Routing ISIS commands http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/mcl/allreleasemcl/all-book.html

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Segment Routing—IS-IS v4 node SID

Table 1: Feature Information for ISIS Segment Routing

Feature Name	Releases	Feature Information
Segment Routing—IS-IS v4 node SID	Cisco IOS XE Release 3.16S	<p>The Segment Routing—ISIS v4 node SID feature provides support for segment routing on IS-IS networks.</p> <p>The following commands were introduced or modified: isis prefix-attributes n-flag-clear, isis segment-routing, show isis segment-routing state</p>