



# IS-IS Advertise IPv6 Link Endpoint Information

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This document describes about advertising parallel links and link endpoint identifier support for IPv6 global addresses.

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## Information About IS-IS Advertise IPv6 Link Endpoint Information

### Advertising Parallel Links

By default, when IS-IS operates over multiple parallel links between two routers, only a single IS-IS neighbor gets advertised regardless of the number of links that may exist to the same router. This reduces the size of the Label Switched Path (LSP) and provides sufficient information for other routers to compute basic IP routing.

Some applications, such as MPLS traffic engineering and segment routing (SR) require all the individual links to be represented by separate IS-IS neighbor advertisements. The advertisement is performed automatically on MPLS or SR enabled devices when either one or both of those features are configured using IS-IS. The BGP-LS feature enabled using **distribute link-state** advertises all parallel links as well.

However, applications such as, telemetry also require to have full visibility of the link state topology. But, there are no specific configuration item that can be tied to provide the full visibility.

To enable full visibility of the link state topology to other than MPLS or SR applications, **advertise link attributes** command is introduced. The **advertise link attributes** command forces IS-IS to advertise IS neighbor information for all links connecting two routers, rather than just one with the lowest cost regardless of whether this is required by other configuration such as SR, MPLS-TE, or BGP-LS. It also adds link endpoint information in the IS neighbor advertisements.

## Advertising Link Endpoint Identifiers

When multiple parallel links to the same neighbor are advertised it is necessary to uniquely identify these links. IS-IS uses local and remote interface identifiers and IP endpoint addresses of the link to uniquely identify multiple parallel links. For numbered link in IPv4 topology, IPv4 endpoint addresses of the link are used, whereas for unnumbered link (as there are no end IPv4 or IPv6 addresses), the link local and remote interface identifiers are used to identify the unnumbered link uniquely.

For links in the IPv6 topology, support for local and remote global address subTLVs are added. This requires adding support for the IPv6 global interface address TLV in hello packets and local or remote interface identifiers subTLV regardless of the address-family and numbered or unnumbered status of the link. Including the interface identifiers allows monitoring applications to associate a unique identifier with the link independent of VRF association and identifies the physical link used by IS neighbor advertisements in different topologies.

## How to Configure IS-IS Advertise IPv6 Link Endpoint Information

### Configuring IS-IS Advertise IPv6 Link Endpoint Information

```
ip cef
ipv6 unicast-routing
ipv6 cef
!
!
interface Ethernet0/0
no ip address
ipv6 address 10:10::1/64
ipv6 router isis
isis network point-to-point
!
interface Ethernet0/1
no ip address
ipv6 address 11:11::1/64
ipv6 router isis
isis network point-to-point
!
router isis
net 49.1111.1111.1111.00
is-type level-1
advertise link attributes
metric-style wide
distribute link-state level-1
!
address-family ipv6
multi-topology
exit-address-family
!
```

## Verifying IS-IS Advertise IPv6 Link Endpoint Information

```
show isis nei de

System Id      Type Interface      IP Address      State Holdtime Circuit Id
TWO           L1 Et0/0           10:10::1        UP      23      01
Area Address(es): 49
SNPA: aabb.cc00.0200
```

```

IPv6 Address(es): FE80::A8BB:CCFF:FE00:200
IPv6 Global Address: 10:10:0:2
State Changed: 00:13:28
Format: Phase V
Remote TID: 2
Local TID: 2
Interface name: Ethernet0/0
Neighbor Circuit Id: 1
TWO          L1      Et0/1          UP      28          02
Area Address(es): 49
SNPA: aabb.cc00.0210
IPv6 Address(es): FE80::A8BB:CCFF:FE00:210
IPv6 Global Address: 11:11::2
State Changed: 00:13:34
Format: Phase V
Remote TID: 2 (parallel adjacency suppressed)
Local TID: 2
Interface name: Ethernet0/1
System Id      Type Interface      IP Address      State Holdtime Circuit Id
Neighbor Circuit Id: 2
ONE(config-router)#do show isis da ve ONE.00-00

```

```

IS-IS Level-1 LSP ONE.00-00
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime/Rcvd  ATT/P/OL
ONE.00-00      * 0x000000B1  0xB0AA        671/*              0/0/0
Area Address: 49
NLPID:         0x8E
Topology:      IPv6 (0x2)
Hostname: ONE
Metric: 10     IS (MT-IPv6) TWO.00
  Local Interface ID: 1, Remote Interface ID: 1
  Interface IPV6 Address: 10:10::1
  Neighbor IPV6 Address: 10:10::2
Metric: 10     IS (MT-IPv6) TWO.00
  Local Interface ID: 2, Remote Interface ID: 2
  Interface IPV6 Address: 11:11::1
  Neighbor IPV6 Address: 11:11::2
IPv6 Address: 11:11::1
Metric: 10     IPv6 (MT-IPv6) 10:10::/64
  Prefix-attr: X:0 R:0 N:0
Metric: 10     IPv6 (MT-IPv6) 11:11::/64
  Prefix-attr: X:0 R:0 N:0
ONE(config-router)#
ONE(config-router)#no adv link attr

```

## Additional References for IS-IS Advertise IPv6 Link Endpoint Information

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>

## Feature Information for IS-IS Advertise IPv6 Link Endpoint Information

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 IS-IS Advertise IPv6 Link Endpoint Information**

Feature Name	Releases	Feature Information
IS-IS Advertise IPv6 Link Endpoint Information	Cisco IOS XE Fuji 16.8.1	IS-IS advertise IPv6 link endpoint information is about advertising parallel links and link endpoint identifier support for IPv6 global addresses.  The following command was introduced by this feature: <b>advertise link attributes.</b>