



## IS-IS IPv6 Client for BFD

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When Bidirectional Forwarding Detection (BFD) support is configured with Intermediate System To Intermediate System (IS-IS) as a registered protocol with BFD, IS-IS receives forwarding path detection failure messages from BFD.

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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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

### Prerequisites for IS-IS IPv6 Client for BFD

- IS-IS must be running on all participating devices.
- The baseline parameters for BFD sessions must be configured on the interfaces that run BFD sessions to BFD neighbors.

# Information About IS-IS IPv6 Client for BFD

## IS-IS BFD Topology

When BFD support is configured with IS-IS as a registered protocol with BFD, IS-IS receives forwarding path detection failure messages from BFD. BFD support for IS-IS can be configured in either router address-family configuration mode or interface configuration mode. IS-IS IPv6 can run in single-topology or in Multi-Topology (MT) mode.

IS-IS BFD supports both IPv4 and IPv6 on the same adjacency for single-topology or multi-topology mode. If BFD is enabled for both IPv4 and IPv6, IS-IS sends two BFD session creation requests to BFD. For single-topology mode, the IS-IS adjacency state can only be UP if both BFD sessions are UP. If either of the BFD sessions is DOWN, the associated IS-IS adjacency state is also DOWN. For MT mode, the IS-IS adjacency state can be UP as long as one of topologies has a BFD session in an UP state.

## IS-IS BFD IPv6 Session Creation

IS-IS requests a BFD session for the interface and IPv6 address of the neighboring device when all of the following conditions are met:

- An IS-IS adjacency entry exists.
- The Address Family Identifier (AFI) specific peer interface address is known.
- IS-IS BFD is enabled for that AFI on an interface.
- IS-IS is enabled for that AFI on the local interface.
- If the neighboring device supports RFC 6213, BFD must be enabled for the specified Multi-Topology Identifier (MTID) or Network Layer Protocol Identifier (NLPID).

## IS-IS BFD IPv6 Session Deletion

When IS-IS BFD IPv6 is disabled on an interface, IS-IS removes related BFD sessions for IPv6 from the adjacent device. When the IS-IS adjacency entry is deleted, all BFD sessions are also deleted. IS-IS requests BFD to remove each BFD session that it has requested when any of the following events occur:

- The IS-IS instance is deleted or un-configured.
- The IS-IS adjacency entry is deleted.
- IS-IS BFD is disabled on the next hop interface for an address-family.
- The neighboring device supports RFC 6213 and indicates that it no longer supports BFD for the specified MTID or NLPID.

# How to Configure IS-IS IPv6 Client for BFD

## Configuring IS-IS IPv6 Client Support for BFD on an Interface

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `interface type number`
4. `ipv6 address ipv6-address/mask`
5. `isis ipv6 bfd`
6. `end`

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>interface type number</b> <b>Example:</b> Device(config)# interface gigabitethernet 6/0/0	Enters interface configuration mode.
Step 4	<b>ipv6 address ipv6-address/mask</b> <b>Example:</b> Device(config-if)# ipv6 address 19:1:1::4/64	Configures IPv6.
Step 5	<b>isis ipv6 bfd</b> <b>Example:</b> Device(config-if)# isis ipv6 bfd	Enables IPv6 BFD on a specific interface that is configured for IS-IS.
Step 6	<b>end</b> <b>Example:</b> Device(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

## Configuring IS-IS IPv6 Client Support for BFD on All Interfaces

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `router isis`
4. `metric-style wide`
5. `address-family ipv6`
6. `multi-topology`
7. `bfd all-interfaces`
8. `end`

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>router isis</b> <b>Example:</b> Device(config)# router isis	Enables the IS-IS routing protocol and enters router configuration mode.
<b>Step 4</b>	<b>metric-style wide</b> <b>Example:</b> Device(config-router)# metric-style wide	(Optional) Configures a device that is running IS-IS so that it generates and accepts only new-style type, length, value objects (TLVs).
<b>Step 5</b>	<b>address-family ipv6</b> <b>Example:</b> Device(config-router)# address-family ipv6	Enters address family configuration mode for configuring IS-IS routing sessions that use standard IPv6 address prefixes.
<b>Step 6</b>	<b>multi-topology</b> <b>Example:</b> Device(config-router-af)# multi-topology	(Optional) Enables multi-topology IS-IS for IPv6.

	Command or Action	Purpose
Step 7	<b>bfd all-interfaces</b> <b>Example:</b> Device(config-router-af)# bfd all-interfaces	Enables BFD for all interfaces participating in the routing process.
Step 8	<b>end</b> <b>Example:</b> Device(config-router-af)# end	Exits address family configuration mode and returns to privileged EXEC mode.

## Configuration Examples for IS-IS IPv6 Client for BFD

### Example: IS-IS IPv6 Client Support for BFD on a Single Interface

```
Device> enable
Device# configure terminal
Device(config)# interface gigabitethernet 6/0/0
Device(config-if)# ipv6 address 19:111:112::2/64
Device(config-if)# isis ipv6 bfd
Device(config-if)# end
```

```
Device> enable
Device# configure terminal
Device(config)# interface gigabitethernet 6/0
Device(config-if)# ipv6 address 19:111:112::1/64
Device(config-if)# isis ipv6 bfd
Device(config-if)# end
```

### Example: IS-IS IPv6 Client Support for BFD on All Interfaces

```
Device> enable
Device# configure terminal
Device(config)# router isis
Device(config-router)# metric-style wide
Device(config-router)# address-family ipv6
Device(config-router-af)# multi-topology
Device(config-router-af)# bfd all-interfaces
Device(config-router-af)# end
```

The following is a sample configuration where interface 0/0/7 of Router A is connected to interface 0/4/6 of router B.

#### Configuration for Router A

```
bfd-template single-hop BFDM
interval min-tx 50 min-rx 50 multiplier 3
```

```

!
interface TenGigabitEthernet0/0/7
  ipv6 address 19:1:1::1/64
  ipv6 router isis
  bfd template BFDM
  isis ipv6 bfd
!
router isis
  net 49.0001.1720.1600.1001.00
!

```

### Configuration on Router B

```

Router B

bfd-template single-hop BFDM
  interval min-tx 50 min-rx 50 multiplier 3
!
interface TenGigabitEthernet0/4/6
  ipv6 address 19:1:1::2/64
  ipv6 router isis
  bfd template BFDM
  isis ipv6 bfd
!
router isis
  net 49.0000.0000.0002.00
!
!

```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<i>Cisco IOS Master Command List, All Releases</i>
BFD commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples.	<i>Cisco IOS IP Routing: Protocol-Independent Command Reference</i>
Configuring and monitoring IS-IS	“Configuring Integrated IS-IS” module of the <i>IP Routing Protocols Configuration Guide</i>
Cisco IOS IPv6 features	<i>Cisco IOS IPv6 Feature Mapping</i>
IPv6 commands	<i>Cisco IOS IPv6 Command Reference</i>

### 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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for IS-IS IPv6 Client for BFD

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.

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**Table 1: Feature Information for IS-IS IPv6 Client for BFD**

Feature Name	Releases	Feature Information
IS-IS IPv6 Client for BFD	15.1(1)SY 15.2(4)S 15.3(1)T	When BFD support is configured with IS-IS as a registered protocol with BFD, IS-IS receives forwarding path detection failure messages from BFD.  The following commands were introduced or modified: <b>bfd all-interfaces, isis ipv6 bfd.</b>

