IS-IS IPv6 Client for BFD

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.

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.

Restrictions for IS-IS IPv6 Client for BFD

Only one IS-IS IPv6 session is supported.

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 ISIS 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

Step 1   **enable**

Example:

```
Device> enable
```

Enables privileged EXEC mode.

- Enter your password if prompted.

Step 2   **configure terminal**

Example:

```
Device# configure terminal
```

Enters global configuration mode.

Step 3   **interface** *type number*

Example:

```
Device(config)# interface gigabitethernet 6/0/0
```

Enters interface configuration mode.

Step 4   **ipv6 address** *ipv6-address/mask*

Example:

```
Device(config-if)# ipv6 address 2001:DB8::1/32
```

Configures IPv6.

Step 5   **isis ipv6 bfd**

Example:

```
Device(config-if)# isis ipv6 bfd
```

Enables IPv6 BFD on a specific interface that is configured for IS-IS.

Step 6   **end**

Example:

```
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

Step 1   **enable**

Example:

```
Device> enable
```

Enables privileged EXEC mode.

- Enter your password if prompted.

Step 2   **configure terminal**

Example:

```
Device# configure terminal
```

Enters global configuration mode.

Step 3   **router isis**

Example:

```
Device(config)# router isis
```

Enables the IS-IS routing protocol and enters router configuration mode.

Step 4   **metric-style wide**

Example:

```
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).

Step 5   **address-family ipv6**

Example:

```
Device(config-router)# address-family ipv6
```

Enters address family configuration mode for configuring IS-IS routing sessions that use standard IPv6 address prefixes.

Step 6   **multi-topology**

Example:

```
Device(config-router-af)# multi-topology
```

(Optional) Enables multi-topology IS-IS for IPv6.

Step 7   **bfd all-interfaces**

Example:

```
Device(config-router-af)# bfd all-interfaces
```

Enables BFD for all interfaces participating in the routing process.

Step 8   **end**

Example:

```
Device(config-router-af)# end
```

Exits address family configuration mode and returns to privileged EXEC mode.

Configuration Examples for ISIS 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 2001:DB8::1/32
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 2001:DB8::1/32
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 2001:DB8::1/32
 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 2001:DB8::1/32
 ipv6 router isis
 bfd template BFDM
 isis ipv6 bfd
!
router isis
 net 49.0000.0000.0002.00
!
!
```