



## Static Route Support for BFD over IPv6

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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.

### Information About Static Route Support for BFD over IPv6

Using the BFDv6 protocol to reach the static route next hop ensures that an IPv6 static route is inserted only in the IPv6 Routing Information Base (RIB) when the next-hop neighbor is reachable. Using the BFDv6 protocol also can remove the IPv6 static route from the IPv6 RIB when the next hop becomes unreachable.

A user can configure IPv6 static BFDv6 neighbors. These neighbor can operate in one of two modes: associated (which is the default) and unassociated. A neighbor can be transitioned between the two modes without interrupting the BFDv6 session associated with the neighbor.

### BFDv6 Associated Mode

In Bidirectional Forwarding Detection for IPv6 (BFDv6) associated mode, an IPv6 static route is automatically associated with an IPv6 static BFDv6 neighbor if the static route next hop exactly matches the static BFDv6 neighbor.

An IPv6 static route requests a BFDv6 session for each static BFDv6 neighbor that has one or more associated IPv6 static routes and is configured over an interface on which BFD has been configured. The state of the

BFDv6 session will be used to determine whether the associated IPv6 static routes are inserted in the IPv6 RIB. For example, static routes are inserted in the IPv6 RIB only if the BFDv6 neighbor is reachable, and the static route is removed from the IPv6 RIB if the BFDv6 neighbor subsequently becomes unreachable.

BFDv6 associated mode requires you to configure a BFD neighbor and static route on both the device on which the BFD-monitored static route is required and on the neighboring device.

## BFDv6 Unassociated Mode

An IPv6 static BFD neighbor may be configured as unassociated. In this mode, the neighbor is not associated with static routes, and the neighbor always requests a BFDv6 session if the interface has been configured for BFDv6.

Unassociated mode is useful in the following situations:

- Bringing up a BFDv6 session in the absence of an IPv6 static route—This case occurs when a static route is on router A, with router B as the next hop. Associated mode requires you to create both a static BFD neighbor and static route on both routers in order to bring up the BFDv6 session from B to A. Specifying the static BFD neighbor in unassociated mode on router B avoids the need to configure an unwanted static route.
- Transition to BFD monitoring of a static route—This case occurs when existing IPv6 static routes are inserted in the IPv6 RIB. Here, you want to enable BFD monitoring for these static routes without any interruption to traffic. If you configure an attached IPv6 static BFD neighbor, then the static routes will immediately be associated with the new static BFD neighbor. However, because a static BFD neighbor starts in a down state, the associated static routes are then removed from the IPv6 RIB and are reinserted when the BFDv6 session comes up. Therefore, you will see an interruption in traffic. This interruption can be avoided by configuring the static BFD neighbor as unassociated, waiting until the BFDv6 session has come up, and then reconfiguring the static BFD neighbor as associated.
- Transition from BFD monitoring of a static route—In this case, IPv6 static routes are monitored by BFD and inserted in the RIB. Here, you want to disable BFD monitoring of the static routes without interrupting traffic flow. This scenario can be achieved by first reconfiguring the static BFD neighbor as detached (thus disassociating the neighbor from the static routes) and then deconfiguring the static BFD neighbor.

# How to Configure Bidirectional Forwarding Detection for IPv6

## Specifying a Static BFDv6 Neighbor

An IPv6 static BFDv6 neighbor is specified separately from an IPv6 static route. An IPv6 static BFDv6 neighbor must be fully configured with the interface and neighbor address and must be directly attached to the local router.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 route static bfd** [*vrf vrf-name*] *interface-type interface-number ipv6-address* [**unassociated**]

## 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>ipv6 route static bfd [vrf vrf-name] interface-type interface-number ipv6-address [unassociated]</b> <b>Example:</b> Device(config)# ipv6 route static bfd gigabitethernet 0/0/0 2001::1	Specifies static route IPv6 BFDv6 neighbors.

## Associating an IPv6 Static Route with a BFDv6 Neighbor

IPv6 static routes are automatically associated with a static BFDv6 neighbor. A static neighbor is associated with a BFDv6 neighbor if the static next-hop explicitly matches the BFDv6 neighbor.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 route static bfd [vrf vrf-name] interface-type interface-number ipv6-address [unassociated]**
4. **ipv6 route [vrf vrf-name] ipv6-prefix / prefix-length {ipv6-address | interface-type interface-number ipv6-address} [nexthop-vrf [vrf-name1 | default]] [administrative-distance] [administrative-multicast-distance | unicast | multicast] [next-hop-address] [tag tag]**

## 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.

	Command or Action	Purpose
<b>Step 3</b>	<b>ipv6 route static bfd</b> [ <i>vrf vrf-name</i> ] <i>interface-type interface-number ipv6-address</i> [ <b>unassociated</b> ]  <b>Example:</b>  Device(config)# ipv6 route static bfd gigabitethernet 0/0/0 2001::1	Specifies static route BFDv6 neighbors.
<b>Step 4</b>	<b>ipv6 route</b> [ <i>vrf vrf-name</i> ] <i>ipv6-prefix / prefix-length</i> { <i>ipv6-address</i>   <i>interface-type interface-number ipv6-address</i> } [ <b>nexthop-vrf</b> [ <i>vrf-name1</i>   <b>default</b> ]] [ <i>administrative-distance</i> ] [ <i>administrative-multicast-distance</i> ] [ <b>unicast</b>   <b>multicast</b> ] [ <i>next-hop-address</i> ] [ <b>tag tag</b> ]  <b>Example:</b>  Device(config)# ipv6 route 2001:DB8::/64 gigabitethernet 0/0/0 2001::1	Establishes static IPv6 routes.

## Configuration Examples for Static Route Support for BFD over IPv6

### Example: Specifying an IPv6 Static BFDv6 Neighbor

The following example specifies a fully configured IPv6 static BFDv6 neighbor. The interface is GigabitEthernet 0/0/0 and the neighbor address is 2001::1.

```
Device(config)# ipv6 route static bfd gigabitethernet 0/0/0 2001::1
```

### Example: Associating an IPv6 Static Route with a BFDv6 Neighbor

In this example, the IPv6 static route 2001:DB8::/32 is associated with the BFDv6 neighbor 2001::1 over the GigabitEthernet 0/0/0 interface:

```
Device(config)# ipv6 route static bfd gigabitethernet 0/0/0 2001::1
Device(config)# ipv6 route 2001:DB8::/32 gigabitethernet 0/0/0 2001::1
```

## Additional References

### Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	<i>IPv6 Configuration Guide</i>

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
IPv6 commands	<a href="#">Cisco IOS IPv6 Command Reference</a>
Cisco IOS IPv6 features	Cisco IOS IPv6 Feature Mapping
Static Route Support for BFD over IPv6	“ <i>Bidirectional Forwarding Detection</i> ” module

### Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	IPv6 RFCs

### 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 Static Route Support for BFD over IPv6

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 Static Route Support for BFD over IPv6

Feature Name	Releases	Feature Information
Static Route Support for BFD over IPv6	Cisco IOS XE Release 2.1 Cisco IOS XE Release 3.6S	<p>Using the BFDv6 protocol to reach the static route next hop ensures that an IPv6 static route is inserted only in the IPv6 Routing Information Base (RIB) when the next-hop neighbor is reachable. Using the BFDv6 protocol also can remove the IPv6 static route from the IPv6 RIB when the next hop becomes unreachable.</p> <p>In Cisco IOS XE Release 3.6S, support was added for the Cisco ASR 903 Router.</p> <p>The following commands were introduced or modified: <b>debug bfd</b>, <b>debug ipv6 static</b>, <b>ipv6 static</b>, <b>ipv6 route static bfd</b>, <b>monitor event ipv6 static</b>, <b>show ipv6 static</b>.</p>