



Configuring Bidirectional Forwarding Detection on Cisco IOS XR

Bidirectional forwarding detection (BFD) provides low-overhead, short-duration detection of failures in the path between adjacent forwarding engines. BFD allows a single mechanism to be used for failure detection over any media and at any protocol layer, with a wide range of detection times and overhead. The fast detection of failures provides immediate reaction to failure in the event of a failed link or neighbor.

Feature History for Configuring Bidirectional Forwarding Detection on Cisco IOS XR

Release	Modification
Release 3.2	<p>This feature was introduced on the Cisco CRS-1 with support for the following features:</p> <ul style="list-style-type: none">• IPv4 asynchronous and echo modes over physical POS and Gigabit Ethernet numbered links and VLANs• BFD IPv4 single-hop• Distribution on line cards• BFD Version 0 and Version 1
Release 3.3.0	<ul style="list-style-type: none">• Support was added to BFD for the following features:<ul style="list-style-type: none">– BFD over bundled VLANs using static routes– Minimum disruption restart (MDR), which allows for a node CPU restart while minimizing traffic loss and network churn.– Fast reroute/Traffic engineering (FRR/TE) using BFD on Ethernet interfaces.• Configuration procedure was added to support the clear bfd counters packet and show bfd counters packet commands.
Release 3.3.1	BFD support was added on the Cisco XR 12000 Series Router.
Release 3.3.2	<ul style="list-style-type: none">• The echo disable command was added to enable users to disable echo mode on routers or interfaces where BFD is used in conjunction with Unicast Reverse Path Forwarding (uRPF).• A new BFD configuration mode was added, under which users can disable echo mode. The bfd command was added to allow users to enter the new BFD configuration mode.
Release 3.4.0	OSPF and IS-IS were supported on BFD over bundle VLANs.

Release 3.5.0	No modifications.
Release 3.6.0	No modifications.

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Prerequisites for Implementing BFD

The following prerequisites are required to implement BFD:

- You must be in a user group associated with a task group that includes the proper task IDs for the BFD commands. Task IDs for commands are listed in the *Cisco IOS XR Interface and Hardware Component Command Reference*.
For detailed information about user groups and task IDs, refer to the *Configuring AAA Services on Cisco IOS XR Software* module of *Cisco IOS XR System Security Configuration Guide*.
- A Cisco CRS-1 or Cisco XR 12000 Series Router that runs Cisco IOS XR software.
- If enabling BFD on Multiprotocol Label Switching (MPLS), an installed composite PIE file including the MPLS package, or a composite-package image is required. For Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), Static, and Open Shortest Path First (OSPF), an installed Cisco IOS XR IP Unicast Routing Core Bundle image is required.
- Interior Gateway Protocol (IGP) is activated on the router if you are using IS-IS or OSPF.
- On the Cisco CRS-1 platform, each line card supporting BFD must be able to perform the following tasks:
 - Send echo packets every 15 ms (under normal conditions)
 - Send control packets every 15 ms (under stress conditions)
 - Send and receive more than 6700 User Datagram Protocol (UDP) pps. This sustains 100 sessions at a 15-ms interval (or 1024 sessions at a 150-ms interval)
- On the Cisco XR 12000 Series Router platform, each line card supporting BFD must be able to perform the following tasks:
 - Send echo packets every 50 ms (under normal conditions)
 - Send control packets every 250 ms (under normal conditions)
 - Send and receive more than 1000 User Datagram Protocol (UDP) pps on the 12000 Series platform. This sustains 50 sessions at a 50-ms interval.
- To enable BFD for a neighbor, the neighbor router must support BFD.

- We recommend configuring the local router ID with the **router-id** command in global configuration mode prior to setting up a BFD session. If you do not configure the local router ID, then the source address of the IP packet is IP address of the output interface.

Information About BFD

Cisco IOS XR software supports BFD for the verification of IPv4 single-hop connectivity. Cisco IOS XR software supports both asynchronous mode and echo mode over physical numbered Packet-over-SONET/SDH (POS) and Gigabit Ethernet links, as follows:

- Echo mode is initiated only after a session is established using BFD control packets. BFD echo packets are transmitted over UDP/IPv4 using source and destination port 3785. The source address of the IP packet is the local router ID, and the destination address is the local interface address.



Note To configure the local router ID, use the **router-id** command in global configuration mode. If you do not configure the local router ID prior to setting up a BFD session, then the source address of the IP Packet is the IP address of the output interface.

- BFD asynchronous packets are transmitted over UDP and IPv4 using source port 49152 and destination port 3784. For asynchronous mode, the source address of the IP packet is the local interface address, and the destination address is the remote interface address.



Note

Echo mode is not supported on VLAN bundles.



Caution

If you are using BFD with Unicast Reverse Path Forwarding (uRPF) on a particular interface, then you need to use the **echo disable** command to disable echo mode on that interface; otherwise, echo packets will be rejected. You can disable echo mode for the entire router, or for an individual interface.

To enable or disable IPv4 uRPF checking on an IPv4 interface, use the **[no] ipv4 verify unicast source reachable-via** command in interface configuration mode. To enable or disable loose IPv6 uRPF checking on an IPv6 interface, use the **[no] ipv6 verify unicast source reachable-via any** command in interface configuration mode.

Keep the following in mind when configuring BFD on Cisco IOS XR software:

- BFD is a fixed-length hello protocol, in which each end of a connection transmits packets periodically over a forwarding path. Cisco IOS XR software supports BFD adaptive detection times.
- BFD can be used with the following applications:
 - BGP
 - IS-IS
 - OSPF
 - MPLS traffic-engineering (MPLS-TE)
 - Static
 - Protocol Independent Multicast (PIM)
- BFD is supported for connections over the following interface types:

- Packet-over-SONET/SDH (POS)
- Gigabit Ethernet (GigE)
- Ten Gigabit Ethernet (TenGigE)
- Virtual LAN (VLAN).
- Cisco IOS XR software supports BFD Version 0 and Version 1. BFD sessions are established using either version, depending upon the neighbor. BFD Version 1 is the default version and is tried initially for session creation.
- BFD is supported on IPv4 directly connected external BGP peers.

The user can perform the following tasks on the router:

- Configure BFD parameters (desired interval and detect multiplier) in the application configuration space.
- Display BFD operational status (state, counters, tracing, and so forth)
- Clear BFD counters

BFD on Bundled VLANs

BFD is supported on bundled VLANs using static routing, IS-IS, and OSPF. When running a BFD session on a bundled VLAN interface, the BFD session is active as long as the VLAN bundle is up.

As long as the VLAN bundle is active, the following events do not cause the BFD session to fail:

- Failure of a component link
- Online insertion and removal (OIR) of a line card which hosts one or more of the component links
- Addition of a component link (by configuration) to the bundle
- Removal of a component link (by configuration) from the bundle
- Shutdown of a component link
- RP failover



Note

For more information on configuring a VLAN bundle, see the [Configuring Link Bundling on Cisco IOS XR Software](#) module.

Keep the following in mind when configuring BFD over bundled VLANs:

- In the case of an RP failover, configured next hops are registered in the Routing Information Base (RIB).
- In the case of a BFD restart, static routes remain in the RIB. BFD sessions are reestablished when BFD restarts.



Note

Static BFD sessions are supported on peers with address prefixes whose next hops are directly connected to the router.

BFD Packet Formats

BFD payload control packets are encapsulated in UDP packets, using destination port 3784 and source port 49152. Even on shared media, like Ethernet, BFD control packets are always sent as unicast packets to the BFD peer.

Echo packets are encapsulated in UDP packets, as well, using destination port 3785 and source port 3785.

Restrictions

- Echo mode is not supported on bundle VLANs.
- If you are using BFD with uRPF on a particular interface, then you need to use the **echo disable** command to disable echo mode on that interface; otherwise, echo packets will be rejected. You can disable echo mode for the entire router, or for an individual interface.
- Only the static, OSPF, and IS-IS applications are supported on BFD over bundle VLANs.

Configuring BFD

The following procedures describe how to configure BFD for BGP. BFD can be enabled per neighbor, or per interface. To enable BFD per neighbor, use the steps in the [“Enabling BFD on a Neighbor”](#) section on page 57. To enable BFD per interface, use the steps in the [“Enabling BFD for OSPF on an Interface”](#) section on page 59.

**Note**

FRR/TE using BFD is supported on POS interfaces and Ethernet interfaces.

Enabling BFD on a Neighbor

The following procedures describe how to configure BFD for BGP on a neighbor router.

**Note**

BFD neighbor router configuration is supported for BGP only.

SUMMARY STEPS

1. **configure**
2. **router bgp** *autonomous-system-number*
3. **bfd minimum-interval** *milliseconds*
4. **bfd multiplier** *multiplier*
5. **neighbor** *ip-address*
6. **remote-as** *autonomous-system-number*
7. **bfd fast-detect**

```

8. end
   or
   commit

```

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	router bgp <i>autonomous-system-number</i> Example: RP/0/RP0/CPU0:router(config)# router bgp 120	Enters BGP configuration mode, allowing you to configure the BGP routing process. Use the show bgp command in EXEC mode to obtain the <i>autonomous-system-number</i> for the current router.
Step 3	bfd minimum-interval <i>milliseconds</i> Example: RP/0/RP0/CPU0:router(config-bgp)# bfd minimum-interval 6500	Sets the BFD minimum interval. Range is 15-30000 milliseconds. This example sets the BFD minimum interval to 6500 milliseconds.
Step 4	bfd multiplier <i>multiplier</i> Example: RP/0/RP0/CPU0:router(config-bgp)# bfd multiplier 7	Sets the BFD multiplier. This example sets the BFD multiplier to 7.
Step 5	neighbor <i>ip-address</i> Example: RP/0/RP0/CPU0:router(config-bgp)# neighbor 172.168.40.24	Places the router in neighbor configuration mode for BGP routing and configures the neighbor IP address as a BGP peer. This example configures the IP address 172.168.40.24 as a BGP peer.
Step 6	remote-as <i>autonomous-system-number</i> Example: RP/0/RP0/CPU0:router(config-bgp-nbr)# remote-as 2002	Creates a neighbor and assigns it a remote autonomous system. This example configures the remote autonomous system to be 2002.

	Command or Action	Purpose
Step 7	bfd fast-detect Example: RP/0/RP0/CPU0:router(config-bgp-nbr)# bfd fast-detect	Enables BFD between the local networking devices and the neighbor whose IP address you configured to be a BGP peer in Step 5. In the example in Step 5, the IP address 172.168.40.24 was set up as the BGP peer. In this example, BFD is enabled between the local networking devices and the neighbor 172.168.40.24.
Step 8	end OR commit Example: RP/0/RP0/CPU0:router (config-bgp-nbr)# end OR RP/0/RP0/CPU0:router(config-bgp-nbr)# commit	Saves configuration changes. <ul style="list-style-type: none"> When you issue the end command, the system prompts you to commit changes: Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]: <ul style="list-style-type: none"> Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. Entering cancel leaves the router in the current configuration session without exiting or committing the configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.

Enabling BFD for OSPF on an Interface

The following procedures describe how to configure BFD for Open Shortest Path First (OSPF) on an interface. The steps in the procedure are common to the steps for configuring BFD on IS-IS and MPLS-TE; only the command mode differs.



Note

BFD per interface configuration is supported for OSPF, IS-IS, and MPLS-TE only.

SUMMARY STEPS

1. **configure**
2. **router ospf** *process-name*
3. **bfd minimum-interval** *milliseconds*
4. **bfd multiplier** *multiplier*
5. **area** *area-id*
6. **interface** *type instance*
7. **bfd fast-detect**

8. **end**
or
commit
9. **show run router ospf**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	router ospf process-name Example: RP/0/RP0/CPU0:router(config)# router ospf 0	Enters OSPF configuration mode, allowing you to configure the OSPF routing process. Use the show ospf command in EXEC mode to obtain the process-name for the current router. Note To configure BFD for IS-IS or MPLS-TE, enter the corresponding configuration mode. For example, for MPLS-TE, enter MPLS-TE configuration mode.
Step 3	bfd minimum-interval milliseconds Example: RP/0/RP0/CPU0:router(config-ospf)# bfd minimum-interval 6500	Sets the BFD minimum interval. Range is 15-30000 milliseconds. This example sets the BFD minimum interval to 6500 milliseconds.
Step 4	bfd multiplier multiplier Example: RP/0/RP0/CPU0:router(config-ospf)# bfd multiplier 7	Sets the BFD multiplier. This example sets the BFD multiplier to 7.
Step 5	area area-id Example: RP/0/RP0/CPU0:router(config-ospf)# area 0	Configures an Open Shortest Path First (OSPF) area. Replace <i>area-id</i> with the OSPF area identifier.
Step 6	interface type instance Example: RP/0/RP0/CPU0:router(config-ospf-ar)# interface gigabitEthernet 0/3/0/1	Enters interface configuration mode and specifies the interface name and notation <i>rack/slot/module/port</i> . <ul style="list-style-type: none"> The example indicates a Gigabit Ethernet interface in modular services card slot 3.
Step 7	bfd fast-detect Example: RP/0/RP0/CPU0:router(config-ospf-ar-if)# bfd fast-detect	Enables BFD to detect failures in the path between adjacent forwarding engines.

	Command or Action	Purpose
Step 8	<pre>end or commit</pre> <p>Example: RP/0/RP0/CPU0:router (config-ospf-ar-if)# end or RP/0/RP0/CPU0:router(config-ospf-ar-if)# commit </p>	<p>Saves configuration changes.</p> <ul style="list-style-type: none"> When you issue the end command, the system prompts you to commit changes: <pre>Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:</pre> <ul style="list-style-type: none"> Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. Entering cancel leaves the router in the current configuration session without exiting or committing the configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 9	<pre>show run router ospf</pre> <p>Example: RP/0/RP0/CPU0:router (config-ospf-ar-if)# show run router ospf </p>	<p>Verify that BFD is enabled on the appropriate interface.</p>

Enabling BFD on a Static Route

The following procedure describes how to enable BFD on a static route.



Note

Bundle VLAN sessions are restricted to an interval of 250 milliseconds and a multiplier of 3. More aggressive parameters are not allowed.

SUMMARY STEPS

- configure**
- router static**
- address-family ipv4 unicast *address nexthop* bfd fast-detect [minimum interval *interval*] [multiplier *multiplier*]**
- vrf *vrf-name***
- address-family ipv4 unicast *address nexthop* bfd fast-detect [minimum interval *interval*] [multiplier *multiplier*]**
- end**
or
commit

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	router static Example: RP/0/RP0/CPU0:router(config)# router static	Enters static route configuration mode, allowing you to configure static routing.
Step 3	address-family ipv4 unicast address nexthop bfd fast-detect [minimum-interval interval] [multiplier multiplier] Example: RP/0/RP0/CPU0:router(config-static)# address-family ipv4 unicast 0.0.0.0/0 2.6.0.1 bfd fast-detect minimum-interval 1000 multiplier 5	Enables BFD fast-detection on the specified IPV4 unicast destination address prefix and on the forwarding next-hop address. Note Include the optional minimum-interval keyword and argument to ensure that the next hop is assigned with the same hello interval. Replace the <i>interval</i> argument with a number that specifies the interval in milliseconds. Range is from 15 through 5000. Note Include the optional multiplier keyword argument to ensure that the next hop is assigned with the same detect multiplier. Replace the <i>multiplier</i> argument with a number that specifies the detect multiplier. Range is from 2 through 10. Note Bundle VLAN sessions are restricted to an interval of 250 milliseconds and a multiplier of 3. More aggressive parameters are not allowed.
Step 4	vrf vrf-name Example: RP/0/RP0/CPU0:router(config-static)# vrf vrf1	Specifies a VPN routing and forwarding (VRF) instance, and enters static route configuration mode for that VRF.

	Command or Action	Purpose
Step 5	<pre>address-family ipv4 unicast address nexthop bfd fast-detect</pre> <p>Example:</p> <pre>RP/0/RP0/CPU0:router(config-static-vrf)# address-family ipv4 unicast 0.0.0.0/0 2.6.0.2</pre>	Enables BFD fast-detection on the specified IPV4 unicast destination address prefix and on the forwarding next-hop address.
Step 6	<pre>end or commit</pre> <p>Example:</p> <pre>RP/0/RP0/CPU0:router (config-static-vrf)# end or RP/0/RP0/CPU0:router(config-static-vrf)# commit</pre>	<p>Saves configuration changes.</p> <ul style="list-style-type: none"> When you issue the end command, the system prompts you to commit changes: Uncommitted changes found. Commit them? <ul style="list-style-type: none"> Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. Entering cancel leaves the user in the same command mode without committing the configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.

Disabling Echo mode on a Router

The following procedures describe how to disable echo mode on router that is using BFD in conjunction with uRPF.



Note

To enable or disable IPv4 uRPF checking on an IPv4 interface, use the **[no] ipv4 verify unicast source reachable-via** command in interface configuration mode. To enable or disable loose IPv6 uRPF checking on an IPv6 interface, use the **[no] ipv6 verify unicast source reachable-via any** command in interface configuration mode.

SUMMARY STEPS

1. **configure**
2. **bgp**
3. **echo disable**
4. **end**
or
commit

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	bfd Example: RP/0/RP0/CPU0:router(config)# bfd	Enters BFD configuration mode.
Step 3	echo disable Example: RP/0/RP0/CPU0:router(config-bfd)# echo disable	Disables echo mode on the router.
Step 4	end OR commit Example: RP/0/RP0/CPU0:router (config-bfd)# end OR RP/0/RP0/CPU0:router(config-bfd)# commit	Saves configuration changes. <ul style="list-style-type: none"> When you issue the end command, the system prompts you to commit changes: <pre>Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:</pre> <ul style="list-style-type: none"> Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. Entering cancel leaves the router in the current configuration session without exiting or committing the configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.

Disabling Echo mode on an Individual Interface or Bundle

The following procedures describe how to disable echo mode on an interface or bundle that is using BFD in conjunction with uRPF.

**Note**

To enable or disable IPv4 uRPF checking on an IPv4 interface, use the **[no] ipv4 verify unicast source reachable-via** command in interface configuration mode. To enable or disable loose IPv6 uRPF checking on an IPv6 interface, use the **[no] ipv6 verify unicast source reachable-via any** command in interface configuration mode.

SUMMARY STEPS

1. **configure**
2. **bgp**
3. **interface** *type instance*
4. **echo disable**
5. **end**
or
commit

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	bfd Example: RP/0/RP0/CPU0:router(config)# bfd	Enters BFD configuration mode.
Step 3	interface <i>type instance</i> Example: RP/0/RP0/CPU0:router(config-bfd)# interface gigabitEthernet 0/1/5/0	Enters BFD interface configuration mode for a specific interface or bundle. In BFD interface configuration mode, you can disable echo mode on an individual interface or bundle.

	Command or Action	Purpose
Step 4	<pre>echo disable</pre> <p>Example: RP/0/RP0/CPU0:router(config-bfd-if)# echo disable </p>	Disables echo mode on the router.
Step 5	<pre>end</pre> <p>or</p> <pre>commit</pre> <p>Example: RP/0/RP0/CPU0:router (config-bfd-if)# end or RP/0/RP0/CPU0:router(config-bfd-if)# commit </p>	<p>Saves configuration changes.</p> <ul style="list-style-type: none"> When you issue the end command, the system prompts you to commit changes: <pre>Uncommitted changes found, commit them before exiting (yes/no/cancel)? [cancel]:</pre> <ul style="list-style-type: none"> Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. Entering cancel leaves the router in the current configuration session without exiting or committing the configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.

Clearing and Displaying BFD Counters

The following procedure describes how to display and clear BFD packet counters. You can clear packet counters for BFD sessions that are hosted on a specific node or on a specific interface.

SUMMARY STEPS

- show bfd counters packet** [*interface type instance*] **location node-id**
- clear bfd counters packet** [*interface type instance*] **location node-id**
- end**
or
commit
- show bfd counters packet** [*interface type instance*] **location node-id**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>show bfd counters packet [interface type instance] location node-id</pre> <p>Example: RP/0/RP0/CPU0:router# show bfd counters packet location 0/3/cpu0 </p>	Displays BFD counters.
Step 2	<pre>clear bfd counters packet [interface type instance] location node-id</pre> <p>Example: RP/0/RP0/CPU0:router# clear bfd counters packet interface POS 0/5/0/1 location 0/5/cpu0 </p>	Clears Bidirectional Forwarding Detection (BFD) counters.
Step 3	<pre>end or commit</pre> <p>Example: RP/0/RP0/CPU0:router (config-bgp-nbr)# end or RP/0/RP0/CPU0:router(config-bgp-nbr)# commit </p>	<p>Saves configuration changes.</p> <p>When you issue the end command, the system prompts you to commit changes: Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:</p> <ul style="list-style-type: none"> - Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. - Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. - Entering cancel leaves the user in the same command mode without committing the configuration changes. <ul style="list-style-type: none"> • Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 4	<pre>show bfd counters packet [interface type instance] location node-id</pre> <p>Example: RP/0/RP0/CPU0:router# show bfd counters packet location 0/3/cpu0 </p>	Verifies that all BFD counters are cleared.

Configuration Examples for Configuring Bidirectional Forwarding Detection on Cisco IOS XR

This section provides the following configuration example:

- [Bidirectional Forwarding Detection: Example, page 68](#)

Bidirectional Forwarding Detection: Example

The following example shows how to configure BFD between autonomous system 65000 and neighbor 192.168.70.24:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router bgp 65000
RP/0/RP0/CPU0:router(config-bgp)# bfd multiplier 2
RP/0/RP0/CPU0:router(config-bgp)# bfd minimum-interval 20
RP/0/RP0/CPU0:router(config-bgp)# neighbor 192.168.70.24
RP/0/RP0/CPU0:router(config-bgp-nbr)# remote-as 2
RP/0/RP0/CPU0:router(config-bgp-nbr)# bfd fast-detect
```

The following example shows how to enable BFD on a Gigabit Ethernet interface:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router ospf 0
RP/0/0/CPU0:router(config-ospf)# area 0
RP/0/0/CPU0:router(config-ospf-ar)# interface gigabitEthernet 0/3/0/1
RP/0/0/CPU0:router(config-ospf-ar-if)# bfd fast-detect
RP/0/0/CPU0:router(config-ospf-ar-if)# commit
RP/0/0/CPU0:Dec 2 07:06:48.508 : config[65685]: %MGBL-LIBTARCFG-6-COMMIT : Configuration
committed by user 'xxx'. Use 'show configuration commit changes 1000001134' to view the
changes.
RP/0/0/CPU0:router(config-ospf-ar-if)# end
RP/0/0/CPU0:Dec 2 07:06:48.848 : config[65685]: %MGBL-SYS-5-CONFIG_I : Configured from
console by lab
RP/0/0/CPU0:router# show run router ospf
router ospf 0
area 0
interface GigabitEthernet0/3/0/1
bfd fast-detect
!
```

The following example shows how to enable BFD on a static route. In this example, BFD sessions are established with the next-hop 3.3.3.3 when it becomes reachable.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router static
RP/0/RP0/CPU0:router (config-static)# address-family ipv4 unicast 2.2.2.0/24 3.3.3.3 bfd
fast-detection
RP/0/RP0/CPU0:router(config-static)# end
```

The following example shows how to disable echo mode on a router:

```
RP/0/RP0/CPU0:router # configure
RP/0/RP0/CPU0:router(config)# bfd
RP/0/RP0/CPU0:router(config-bfd)# echo disable
```

The following example shows how to disable echo mode on an interface:

```
RP/0/RP0/CPU0:router # configure
RP/0/RP0/CPU0:router(config)# bfd
RP/0/RP0/CPU0:router(config-bfd)# interface pos 0/1/0/0
RP/0/RP0/CPU0:router(config-bfd-if)# echo disable
```


Where to Go Next

BFD is supported over multiple platforms; refer to the related command reference document for more detailed information about these commands.

- *BGP Commands on Cisco IOS XR Software*
- *IS-IS Commands on Cisco IOS XR Software*
- *OSPF Commands on Cisco IOS XR Software*
- *Static Routing Commands on Cisco IOS XR Software*
- *MPLS Traffic Engineering Commands on Cisco IOS XR Software*

Additional References

The following sections provide references related to implementing BFD for Cisco IOS XR software.

Related Documents

Related Topic	Document Title
BFD commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS XR Interface and Hardware Command Reference</i>

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

RFCs

RFCs	Title
draft-ietf-bfd-base-06	<i>Bidirectional Forwarding Detection</i> , March, 2007
draft-ietf-bfd-v4v6-1hop-06	<i>BFD for IPv4 and IPv6 (Single Hop)</i> , March, 2007

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport