



Bidirectional Forwarding Detection Commands on Cisco IOS XR Software

This chapter describes the commands used to configure and monitor Bidirectional Forwarding Detection (BFD).

address-family ipv4 unicast (BFD)

To enable bidirectional forwarding detection (BFD) fast-detection on a specific IPV4 unicast destination address prefix and on the forwarding next-hop address, use the **address-family ipv4 unicast** command in static route configuration mode. To return the router to the default setting, use the **no** form of this command.

```
address-family ipv4 unicast address nexthop bfd fast-detect [minimum interval interval]
[multiplier multiplier]
```

```
no address-family ipv4 unicast address nexthop bfd fast-detect [minimum interval interval]
[multiplier multiplier]
```

Syntax Description		
	<i>address</i>	Specifies the IPv4 unicast destination address and prefix on which to enable BFD fast-detection.
	<i>nexthop</i>	Specifies the next-hop address on which to enable BFD fast-detection.
	bfd fast-detect	Enables BFD fast-detection on the specified IPV4 unicast destination address prefix and on the forwarding next-hop address.
	minimum interval <i>interval</i>	(Optional) Ensures that the next hop is assigned with the same hello interval. Replace <i>interval</i> with a number that specifies the interval in milliseconds. Range is from 15 through 5000.
	multiplier <i>multiplier</i>	(Optional) Ensures that the next hop is assigned with the same detect multiplier. Replace <i>multiplier</i> with a number that specifies the detect multiplier. Range is from 2 through 10.

Defaults	
	<i>interval</i> =15
	<i>multiplier</i> = 3

Command Modes	
	Static route configuration mode

Command History.	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If the multiplier is changed using the **bfd multiplier** command, the new parameter is used to update all existing BFD sessions for the protocol (BGP, IS-IS, MPLS-TE, or OSPF).

Task ID	Task ID	Operations
	static	read, write

Examples

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
```

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
show bfd all	Displays BFD information.

bfd

To enter Bidirectional Forwarding Detection (BFD) configuration mode, use the **bfd** command in global configuration mode. To exit BFD configuration mode and return to the global configuration mode, use the **no** form of this command.

bfd

no bfd

Syntax Description This command has no arguments or keywords.

Defaults .No default behavior or values

Command Modes Global configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

When you issue the **bfd** command in global configuration mode, the CLI prompt changes to “config-bfd,” indicating that you have entered BFD configuration mode. In the following sample output, the question mark (?) online help function displays all the commands available under BFD configuration mode:

```
RP/0/RP0/CPU0:router(config)# bfd

RP/0/RP0/CPU0:router(config-bfd)#?
  commit      Commit the configuration changes to running
  describe    Describe a command without taking real actions
  do          Run an exec command
  echo        Configure BFD echo parameters
  exit        Exit from this submode
  interface    Configure BFD on an interface
  no          Negate a command or set its defaults
  root        Exit to the global configuration mode
  show        Show contents of configuration
```

Task ID	Task ID	Operations
	bgp	read, write
	ospf	read, write
	isis	read, write
	mpls-te	read, write

Examples

The following example shows how to enter BFD configuration mode:

```
RP/0/RP0/CPU0:router # configure
```

```
RP/0/RP0/CPU0:router(config)# bfd
```

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

Related Commands

Command	Description
echo disable	Disables echo mode on an individual interface or on the entire router.
interface (BFD)	Enters BFD interface configuration mode.
show bfd all	Displays BFD information.

bfd fast-detect

To enable bidirectional forwarding detection (BFD) to detect failures in the path between adjacent forwarding engines, use the **bfd fast-detect** command in the appropriate configuration mode. To return the software to the default state in which BFD is not enabled, use the **no** form of this command.

bfd fast-detect [**disable** | **ipv4**]

no bfd fast-detect

Syntax Description	disable	Prevents BFD settings from being inherited from the parent.
		Note The disable keyword is available in BGP configuration mode and OSPF router configuration mode only.
Syntax Description	ipv4	Enables Intermediate System-to-Intermediate System (IS-IS) BFD detection of failures in the path between adjacent forwarding engines.
		Note The ipv4 keyword is available in IS-IS router configuration mode only.

Defaults BFD is not enabled.

Command Modes

- BGP configuration mode**
- Neighbor configuration
- Session group configuration
- Neighbor group configuration
- IS-IS router configuration mode**
- Interface configuration
- MPLS TE configuration mode**
- Interface configuration
- OSPF router configuration mode**
- Router configuration
- Area configuration
- Area Interface configuration
- Router PIM interface configuration mode**

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	The bfd fast-detect command was supported in router PIM interface configuration mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

**Note**

BFD is supported on IPv4 directly connected external BGP peers.

Use the **bfd fast-detect** command to provide protocol- and media-independent BFD for short duration detection of failures in the path between adjacent forwarding engines, including the interfaces and data links.

BFD must be configured on directly connected neighbors for a BFD session to be established between the neighbors.

When MPLS-TE tunnels are protected by backup tunnels, BFD failure triggers fast reroute on affected tunnels.

The **disable** keyword is available in BGP configuration mode and OSPF router configuration mode only. To disable BFD or return the software to the default state in which BFD is not enabled in IS-IS router configuration mode and MPLS-TE configuration mode, you must enter the **no bfd fast-detect** command.

**Note**

The purpose of the **disable** option is to override inherited configuration. For example, if you enable BFD under an OSPF area, then BFD is enabled for all interfaces in that area. If you do not want BFD running on one of the interfaces in that OSPF area, then you need to configure the **disable** option under that interface only.

Task ID

Task ID	Operations
bgp	read, write

Examples

The following example shows how to configure BFD on a BGP router:

```
RP/0/RP0/CPU0:router # configure
RP/0/RP0/CPU0:router(config)# router bgp 65000
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
```

Related Commands

Command	Description
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.
show bfd all	Displays BFD information.

bfd minimum-interval

To set the bidirectional forwarding detection (BFD) interval, use the **bfd minimum-interval** command in the appropriate configuration mode. To return the router to the default setting, use the **no** form of this command.

bfd minimum-interval *milliseconds*

no bfd minimum-interval

Syntax Description	<i>milliseconds</i>	Interval between sending BFD packets to the neighbor. The ranges are:
		<ul style="list-style-type: none"> • On the Cisco CRS-1 <ul style="list-style-type: none"> – BGP—15 through 30000 milliseconds – IS-IS—15 through 5000 milliseconds – MPLS-TE—15 through 200 milliseconds – OSPF—15 through 30000 milliseconds • On the Cisco XR 12000 Series Router <ul style="list-style-type: none"> – BGP—50 through 30000 milliseconds – IS-IS—50 through 5000 milliseconds – MPLS-TE—50 through 200 milliseconds – OSPF—50 through 30000 milliseconds

Defaults	<p>BGP <i>interval</i> = 50 milliseconds</p> <p>IS-IS <i>interval</i> = 150 milliseconds</p> <p>OSPF <i>interval</i> = 150 milliseconds</p> <p>MPLS-TE <i>interval</i> on the Cisco CRS-1=15 milliseconds</p> <p>MPLS-TE <i>interval</i> on the Cisco XR 12000 Series Router=50 milliseconds</p>
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Command Modes	<p>BGP configuration mode</p> <p>Router configuration</p> <p>IS-IS configuration mode</p> <p>Interface configuration</p> <p>MPLS-TE configuration mode</p> <p>MPLS TE configuration</p>
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OSPF router configuration mode

Router configuration
 Interface configuration
 Area configuration

Router PIM interface configuration mode**Command History**

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1.
Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
Release 3.4.0	The bfd minimum-interval command was supported in router PIM interface configuration mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If the minimum interval is changed using the **bfd minimum-interval** command, the new parameter updates all affected BFD sessions under the command mode in which the minimum interval was changed. For example, if you change the minimum interval in interface configuration mode for one OSPF interface, only the session for that specific interface is affected. If you change the minimum interval in OSPF area configuration mode, only the sessions under the specified OSPF area are affected. However, if you change the minimum interval in router configuration mode, then the configuration takes place in all OSPF sessions under the interface configuration mode and the area configuration mode.

**Note**

BFD sessions must be configured with a minimum interval of 50 milliseconds or more when echo-mode is available, and 250 milliseconds or more when only asynchronous mode is available.

Keep the following router-specific rules in mind when configuring the minimum BFD interval:

- When asynchronous mode is available on the Cisco CRS-1, the minimum interval must be less than or equal to 50 milliseconds for up to 100 sessions on the line card. If you are running the maximum of 1024 sessions, the failure detection interval must be less than or equal to 500 milliseconds.
- When asynchronous mode is available on the Cisco XR 12000 Series Router, the minimum interval must be greater than or equal to 50 milliseconds, with a multiplier of 3 for up to 50 sessions per line card.
- When echo mode is available on the Cisco CRS-1, the minimum interval must be less than or equal to 50 milliseconds for up to 100 sessions on the line card. If you are running the maximum of 1024 sessions, the failure detection interval must be less than or equal to 500 milliseconds.
- When echo mode is available on the Cisco XR 12000 Series Router, the minimum interval must be 250 milliseconds with a multiplier of 3.

Task ID

Task ID	Operations
bgp	read, write

Examples

The following example shows how to set the BFD minimum interval:

```
RP/0/RP0/CPU0:router(config)# router bgp 6500
```

```
RP/0/RP0/CPU0:router(config-bgp)# bfd minimum-interval 275
```

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd multiplier	Sets the BFD multiplier.
show bfd all	Displays BFD information.

bfd multiplier

To set the bidirectional forwarding detection (BFD) multiplier, use the **bfd multiplier** command in the appropriate configuration mode. To return the router to the default setting, use the **no** form of this command.

bfd multiplier *multiplier*

no bfd multiplier

Syntax Description	<i>multiplier</i>	<p>Number of times a packets is missed before BFD declares the neighbor down. On the Cisco CRS-1, the ranges are as follows:</p> <ul style="list-style-type: none"> • BGP—2 through 16 • IS-IS—2 through 50 • MPLS-TE—2 through 10 • OSPF—2 through 50 <p>One the Cisco XR 12000 Series Router, the ranges are as follows:</p> <ul style="list-style-type: none"> • BGP—3 through 16 • IS-IS—3 through 50 • MPLS-TE—3 through 10 • OSPF—3 through 50
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Defaults	<i>multiplier = 3</i>
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Command Modes	<p>BGP configuration mode Router configuration</p> <p>IS-IS configuration mode Interface configuration</p> <p>MPLS-TE configuration mode MPLS-TE configuration</p>
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OSPF router configuration mode

Router configuration
 Interface configuration
 Area configuration

Router PIM interface configuration mode

Command History.	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	The bfd multiplier command was supported in router PIM interface configuration mode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If the multiplier is changed using the **bfd multiplier** command, the new parameter is used to update all existing BFD sessions for the protocol (BGP, IS-IS, MPLS-TE, or OSPF).

Task ID

Task ID	Task ID	Operations
	bgp	read, write

Examples

The following example shows how to set the BFD multiplier:

```
RP/0/RP0/CPU0:router(config)# router bgp 65000
```

```
RP/0/RP0/CPU0:router(config-bgp)# bfd multiplier 2
```

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
show bfd all	Displays BFD information.

clear bfd counters

To clear Bidirectional Forwarding Detection (BFD) counters, use the **clear bfd counters** command in EXEC mode.

clear bfd counters packet [*interface type instance*] **location** *node-id*

Syntax Description	
packet	Clears BFD packets counters.
interface	(Optional) Clears BFD counters from the specified interface.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>instance</i>	<p>Either a physical interface instance or a virtual interface instance:</p> <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i>, and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>—Chassis number of the rack. <i>slot</i>—Physical slot number of the card. <i>module</i>—Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>—Physical port number of the interface. <p>Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
location <i>node-id</i>	Clears BFD counters from the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.

■ clear bfd counters

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
bgp	read, write
ospf	read, write
isis	read, write
mpls-te	read, write

Examples

The following is sample output from the **clear bfd counters** command.

```
RP/0/RP0/CPU0:router# clear bfd counters packet interface POS 0/5/0/1 location 0/5/cpu0
```

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.
show bfd all	Displays BFD information.

echo disable

To disable echo mode on a router or on an individual interface or bundle, use the **echo disable** command in Bidirectional Forwarding Detection (BFD) configuration mode. To return the router to the default configuration where echo mode is enabled, use the **no** form of this command.

echo disable

no echo disable

Syntax Description This command has no arguments or keywords.

Defaults .No default behavior or values

Command Modes BFD configuration
BFD interface configuration

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If you are using BFD with Unicast Reverse Path Forwarding (uRPF), you need to use the **echo disable** command to disable echo mode; otherwise, echo packets will be rejected.



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.

Task ID	Task ID	Operations
	bgp	read, write
	ospf	read, write
	isis	read, write
	mpls-te	read, write

Examples

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 individual 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
```

Related Commands

Command	Description
bfd	Enters BFD configuration mode.
interface (BFD)	Enters BFD interface configuration mode.
ipv4 verify unicast source reachable-via	Enables and disables IPv4 uRPF checking on an IPv4 interface.
ipv6 verify unicast source reachable-via any	Enables and disables loose IPv6 uRPF checking on an IPv6 interface.
show bfd all	Displays BFD information.

interface (BFD)

To enter Bidirectional Forwarding Detection (BFD) interface configuration mode, where you can disable echo mode on an interface, use the **interface** command in BFD configuration mode. To return to BFD configuration mode, use the **no** form of this command.

interface *type instance*

no interface *type instance*

Syntax Description	
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>instance</i>	<p>Either a physical interface instance, virtual interface instance, or bundle:</p> <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i>, and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>—Chassis number of the rack. <i>slot</i>—Physical slot number of the card. <i>module</i>—Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>—Physical port number of the interface. Virtual interface instance. Range of numbers varies depending on interface type. Bundle ID for a POS or Ethernet bundle. Range is from 1 through 65535. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>

Defaults .No default behavior or values

Command Modes BFD configuration

Command History	Release	Modification
	Release 3.4.0	This command was introduced on the Cisco CRS-1 and Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If you are using BFD with Unicast Reverse Path Forwarding (uRPF) on a particular interface, then you need to use the **echo disable** command in BFD interface configuration mode to disable echo mode on that interface; otherwise, echo packets will be rejected by the interface.

**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.

Task ID

Task ID	Operations
bgp	read, write
ospf	read, write
isis	read, write
mpls-te	read, write

Examples

The following example shows how to enter BFD interface configuration mode for a Packet-over-SONET/SDH (POS) 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)#
```

Related Commands

Command	Description
bfd	Enters BFD configuration mode.
echo disable	Disables echo mode on an individual interface or on the entire router.
ipv4 verify unicast source reachable-via	Enables and disables IPv4 uRPF checking on an IPv4 interface.
ipv6 verify unicast source reachable-via any	Enables and disables loose IPv6 uRPF checking on an IPv6 interface.
show bfd all	Displays BFD information.

show bfd

To display summarized information about all Bidirectional Forwarding Detection (BFD) sessions on the current router, use the **show bfd** command in EXEC mode.

show bfd

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	bgp	read
	ospf	read
	isis	read
	mpls-te	read

Examples The following is sample output from the **show bfd** command:

```
RP/0/RP0/CPU0:router# show bfd

IPv4 Sessions Up: 0, Down: 0, Total: 0
```

Table 60 describes the significant fields shown in the display.

Table 60 *show bfd Field Descriptions*

Field	Description
IPV4 Sessions Up	Number of active BFD sessions.
Down	Number of down BFD sessions.
Total	Total number of BFD sessions.

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.

show bfd all

To display Bidirectional Forwarding Detection (BFD) information, use the **show bfd** command in EXEC mode.

```
show bfd all [session [interface type instance [destination ip-address]] [detail]] [location node-id]
```

Syntax	Description
session	(Optional) Specifies BFD sessions.
interface <i>type instance</i>	(Optional) Specifies an interface. Replace the <i>type</i> argument with the interface type. Note For more information, use the question mark (?) online help function. Replace the <i>instance</i> argument with a physical interface instance or a virtual interface instance. <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i>, and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>—Chassis number of the rack. <i>slot</i>—Physical slot number of the card. <i>module</i>—Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>—Physical port number of the interface. Virtual interface instance. Number range varies depending on interface type. Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.
destination <i>ip-address</i>	(Optional) Displays the BFD session destined for the specified IP address.
detail	(Optional) Specifies detailed session information, including statistics and number of state transitions.
location <i>node-id</i>	(Optional) Displays BFD sessions hosted from the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

Enter the **show bfd all** command without specifying any of the optional keywords or arguments to display summarized information about all BFD sessions on the router.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1.
Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
Release 3.4.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
bgp	read
ospf	read
isis	read
mpls-te	read

Examples

The following is sample output from the **show bfd all** command:

```
RP/0/RP0/CPU0:router# show bfd all
```

```
IIPV4 Sessions Up: 0, Down: 1, Standby: 0, Total: 1
```

[Table 61](#) describes the significant fields shown in the display.

Table 61 *show bfd all Field Descriptions*

Field	Description
IPV4 Sessions Up	Number of active BFD sessions.
Down	Number of down BFD sessions.
Total	Total number of BFD sessions.

show bfd client

To display Bidirectional Forwarding Detection (BFD) client information, use the **show bfd client** command in EXEC mode.

show bfd client [detail]

Syntax Description	detail	(Optional) Specifies detailed client information including number of sessions and client reconnects.
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Defaults Enter the **show bfd client** command without specifying the **detail** keyword to display summarized BFD client information.

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	bgp	read
	ospf	read
	isis	read
	mpls-te	read

Examples The following is sample output from the **show bfd client** command:

```
RP/0/RP0/CPU0:router# show bfd client
```

```
Name           Node           Num sessions
-----
bgp             0/RP1/CPU0    0
isis           0/RP1/CPU0    0
isis           0/RP1/CPU0    0
```

Table 62 describes the significant fields shown in the display.

Table 62 *show bfd client Field Descriptions*

Field	Description
Name	Name of the BFD client.
Node	Location of the BFD client.
Num sessions	Number of active sessions for the BFD client.

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.
show bfd all	Displays BFD information.

show bfd counters packet

To display Bidirectional Forwarding Detection (BFD) counter information, use the **show bfd counters packet** command in EXEC mode.

show bfd counters packet [**interface** *type instance*] **location** *node-id*

Syntax Description	
packet	Displays BFD packets counters.
interface	(Optional) Specifies BFD counters from the specified interface.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>instance</i>	<p>Either a physical interface instance or a virtual interface instance:</p> <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i>, and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>—Chassis number of the rack. <i>slot</i>—Physical slot number of the card. <i>module</i>—Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>—Physical port number of the interface. <p>Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
location <i>node-id</i>	Displays BFD counters from the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults No default behavior or values.

Command Modes EXEC

Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
bgp	read
ospf	read
isis	read
mpls-te	read

Examples

The following is sample output from the **show bfd counters packet** command:

```
RP/0/RP0/CPU0:router# show bfd counters packet location 0/3/cpu0
```

```

POS 0/3/0/0   Recv  Xmit           Recv  Xmit
  Async:      2341 2311  Echo:    0    0
POS 0/3/0/1   Recv  Xmit           Recv  Xmit
  Async:      0   451  Echo:    0    0

```

[Table 63](#) describes the significant fields shown in the display.

Table 63 *show bfd counters packet Field Descriptions*

Field	Description
Async	Number of asynchronous mode (control) packets that were received or transmitted on the specified interface.
Echo	Number of echo packets that were received or transmitted on the specified interface.

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.
show bfd all	Displays BFD information.

show bfd ipv4

To display Bidirectional Forwarding Detection (BFD) information related to IPv4 address families, use the **show bfd ipv4** command in EXEC mode.

```
show bfd ipv4 [session [interface type instance [destination ip-address]] [detail]] [location node-id]
```

Syntax Description	
session	(Optional) Specifies BFD sessions.
interface <i>type instance</i>	<p>(Optional) Specifies an interface. Replace the <i>type</i> argument with the Interface type.</p> <p>Replace the <i>instance</i> argument with a physical interface instance or a virtual interface instance:</p> <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i>, and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>—Chassis number of the rack. <i>slot</i>—Physical slot number of the card. <i>module</i>—Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>—Physical port number of the interface. <p>Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
destination <i>ip-address</i>	(Optional) Displays the BFD session destined for the specified IP address.
detail	(Optional) Specifies detailed session information, including statistics and number of state transitions.
location <i>node-id</i>	(Optional) Displays BFD sessions hosted from the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

Enter the **show bfd ipv4** command without any of the optional parameters to display information about all BFD IPv4 sessions on the router.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1.
Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
Release 3.4.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
bgp	read
ospf	read
isis	read
mpls-te	read

Examples

The following is sample output from the **show bfd ipv4** command:

```
RP/0/RP0/CPU0:router# show bfd ipv4

IPv4 Sessions Up: 0, Down: 0, Total: 0
```

[Table 64](#) describes the significant fields shown in the display.

Table 64 *show bfd ipv4 Field Descriptions*

Field	Description
IPv4 Sessions Up	Number of active BFD sessions.
Down	Number of down BFD sessions.
Total	Total number of BFD sessions.

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.

show bfd location

To display Bidirectional Forwarding Detection (BFD) IPv4 session information for a specific location, use the **show bfd location** command in EXEC mode.

show bfd location *node-id*

Syntax Description	location <i>node-id</i>	Displays BFD information for the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
---------------------------	--------------------------------	--

Defaults	No default behavior or values.
-----------------	--------------------------------

Command Modes	EXEC
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Command History	Release	Modification
	Release 3.2	This command was introduced on the Cisco CRS-1.
	Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
	Release 3.4.0	No modification.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
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Task ID	Task ID	Operations
	bgp	read
	ospf	read
	isis	read
	mpls-te	read

Examples	The following is sample output from the show bfd location command:
-----------------	---

```
RP/0/RP0/CPU0:router# show bfd location 0/3/cpu0
```

```
IPv4 Sessions Up: 0, Down: 1, Standby: 0, Total: 1
```

Table 65 describes the significant fields shown in the display.

Table 65 *show bfd location Field Descriptions*

Field	Description
IPv4 Sessions Up	Number of active BFD sessions.
Down	Number of down BFD sessions.
Standby	Number of standby BFD sessions.
Total	Total number of BFD sessions.

show bfd session

To display Bidirectional Forwarding Detection (BFD) session information, use the **show bfd session** command in EXEC mode.

```
show bfd session [interface type instance [destination ip-address] [detail]] [location node-id]
```

Syntax Description	
interface <i>type instance</i>	<p>(Optional) Specifies an interface. Replace the <i>type</i> argument with the Interface type.</p> <p>Note For more information, use the question mark (?) online help function.</p> <p>Replace the <i>instance</i> argument with a physical interface instance or a virtual interface instance:</p> <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i>, and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>—Chassis number of the rack. <i>slot</i>—Physical slot number of the card. <i>module</i>—Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>—Physical port number of the interface. <p>Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
destination <i>ip-address</i>	(Optional) Displays the BFD session destined for the specified IP address.
detail	(Optional) Specifies detailed session information, including statistics and number of state transitions.
location <i>node-id</i>	(Optional) Displays BFD sessions hosted from the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

Enter the **show bfd session** command without any of the optional parameters to display information about all BFD sessions on the router.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced on the Cisco CRS-1.
Release 3.3.0	This command was first support the Cisco XR 12000 Series Router.
Release 3.4.0	No modification.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
bgp	read
ospf	read
isis	read
mpls-te	read

Examples

The following is sample output from the **show bfd session** command with the **detail** keyword:

```
RP/0/RP0/CPU0:router# show bfd session detail

I/f:TenGigE0/2/0/0.6, Location:0/2/CPU0, dest:10.0.6.2, src:10.0.6.1
State:UP for 0d:0h:3m:4s, number of times UP:1
Received parameters:
Version:1, desired tx interval:2 s, required rx interval:2 s
Required echo rx interval:1 ms, multiplier:3, diag:None
My discr:589830, your discr:590028, state UP, D/F/P/C/A:0/0/0/1/0
Transmitted parameters:
Version:1, desired tx interval:2 s, required rx interval:2 s
Required echo rx interval:1 ms, multiplier:3, diag:None
My discr:590028, your discr:589830, state UP, D/F/P/C/A:0/0/0/1/0
Timer Values:
Local negotiated async tx interval:2 s
Remote negotiated async tx interval:2 s
Desired echo tx interval:250 ms, local negotiated echo tx interval:250 ms
Echo detection time:750 ms(250 ms*3), async detection time:6 s(2 s*3)
Local Stats:
Intervals between async packets:
Tx:Number of intervals=100, min=952 ms, max=2001 ms, avg=1835 ms
Last packet transmitted 606 ms ago
Rx:Number of intervals=100, min=1665 ms, max=2001 ms, avg=1828 ms
Last packet received 1302 ms ago
Intervals between echo packets:
Tx:Number of intervals=100, min=250 ms, max=252 ms, avg=250 ms
Last packet transmitted 188 ms ago
Rx:Number of intervals=100, min=250 ms, max=252 ms, avg=250 ms
Last packet received 187 ms ago
Latency of echo packets (time between tx and rx):
Number of packets:100, min=1 ms, max=2 ms, avg=1 ms
Session owner information:
Client          Desired interval      Multiplier
-----
bgp-            250 ms                3
```

Table 66 describes the significant fields shown in the display.

Table 66 *show bfd session detail command Field Descriptions*

Field	Description
I/f	Interface type.
Location	Location of the node that hosts the local endpoint of the connection, in the <i>rack/slot/module</i> notation
dest	IP address of the destination endpoint.
src	IP address of the source endpoint.
State	Current state of the connection, and the number of days, hours, minutes, and seconds that this connection has been active.
number of times UP	Number of times this connection has been brought up.
Received parameters	Provides information on the last transmitted control packet for the session. Possible values are: <ul style="list-style-type: none"> • Version—Version number of the BFD protocol. • desired tx interval—Desired transmit interval. • required rx interval—Required receive interval. • Required echo rx interval—Required echo receive interval. • multiplier—Number of times a packets is missed before BFD declares the neighbor down. • diag—Diagnostic code specifying the peer system's reason for the last transition of the session from Up to some other state. • My discr—Unique, nonzero discriminator value generated by the transmitting system, used to demultiplex multiple BFD sessions between the same pair of systems. • your discr—Discriminator received from the corresponding remote system. This field reflects back the received value of My discr, or is zero if that value is unknown.
Transmitted parameters	Provides information on the last transmitted control packet for the session. Possible values are: <ul style="list-style-type: none"> • Version—Version number of the BFD protocol. • desired tx interval—Desired transmit interval. • required rx interval—Required receive interval • Required echo rx interval—Required echo receive interval. • multiplier—Number of times a packets is missed before BFD declares the neighbor down. • diag—Diagnostic code specifying the local system's reason for the last transition of the session from Up to some other state. • My discr—Unique, nonzero discriminator value generated by the transmitting system, used to demultiplex multiple BFD sessions between the same pair of systems. • your discr—Discriminator received from the corresponding remote system. This field reflects back the received value of My discr, or is zero if that value is unknown.

Table 66 show bfd session detail command Field Descriptions (continued)

Field	Description
Timer Values	<p>Provides the following information on the timer values used by the local and remote ends:</p> <ul style="list-style-type: none"> • Local negotiated async tx interval—Interval at which control packets are being transmitted by the local end. • Remote negotiated async tx interval—Interval at which control packets should be transmitted by the remote end. • Desired echo tx interval—Interval at which the local end would like to transmit echo packets. • local negotiated echo tx interval—Interval at which echo packets are being transmitted by the local end. • Echo detection time—Local failure detection time of echo packets. It is the product of the local negotiated echo tx interval and the local multiplier. • async detection time—Local failure detection time of the asynchronous mode (control packets). It is the product of the remote negotiated async tx interval and the remote multiplier.
Local Stats	<p>Displays the following local transmit and receive statistics:</p> <ul style="list-style-type: none"> • Intervals between async packets—Provides measurements on intervals between control packets (tx and rx): <ul style="list-style-type: none"> – Number of intervals—Number of sampled intervals between control packets – min—Minimum measured interval between 2 consecutive control packets – max—Maximum measured interval between 2 consecutive control packets – avg—Average measured interval between 2 consecutive control packets – Last packet received/transmitted—Indicates how long ago the last control packet was received/transmitted. • Intervals between echo packets—Provides measurements on intervals between echo packets (tx and rx). The measurements have the same meaning as for async packets. • Latency of echo packets (time between tx and rx)—Provides measurements on latency of echo packets, i.e. the time between tx and rx of echo packets: <ul style="list-style-type: none"> – Number of packets—Number of sampled echo packets. – min—Minimum measured latency for echo packets. – max—Maximum measured latency of echo packets. – avg—Average measured latency of echo packets.
Session owner information	<p>Provides the following information about the session owner:</p> <ul style="list-style-type: none"> • Client—Name of the client application process. • Desired interval—Desired interval provided by the client, in milliseconds. • Multiplier—Multiplier value provided by the client.

Related Commands

Command	Description
bfd fast-detect	Enables BFD for communication failure detection.
bfd minimum-interval	Sets the BFD interval.
bfd multiplier	Sets the BFD multiplier.

■ show bfd session