



HSRP Commands

This chapter describes the Cisco IOS XR software commands used to configure and monitor the Hot Standby Router Protocol (HSRP).

For detailed information about HSRP concepts, configuration tasks, and examples, refer to the *Cisco IOS XR IP Addresses and Services Configuration Guide for the Cisco XR 12000 Series Router*.

- [address \(hsrp\), page 2](#)
- [address global\(HSRP\), page 4](#)
- [address global slave\(HSRP\), page 5](#)
- [address linklocal\(HSRP\), page 6](#)
- [address linklocal\(HSRP\), page 7](#)
- [address secondary \(hsrp\), page 9](#)
- [authentication \(hsrp\), page 10](#)
- [bfd fast-detect \(hsrp\), page 11](#)
- [clear hsrp statistics, page 13](#)
- [hsrp authentication, page 14](#)
- [hsrp bfd fast-detect, page 15](#)
- [hsrp bfd minimum-interval, page 16](#)
- [hsrp bfd multiplier, page 18](#)
- [hsrp delay, page 19](#)
- [hsrp ipv4, page 20](#)
- [hsrp mac-address, page 22](#)
- [hsrp preempt, page 24](#)
- [hsrp priority, page 25](#)
- [hsrp redirects, page 27](#)
- [hsrp timers, page 28](#)
- [hsrp track, page 30](#)

- [hsrp use-bia](#), page 32
- [interface \(HSRP\)](#), page 33
- [mac-address \(hsrp\)](#), page 34
- [preempt \(hsrp\)](#), page 36
- [priority \(hsrp\)](#), page 38
- [router hsrp](#), page 39
- [session name](#), page 40
- [show hsrp](#), page 41
- [show hsrp bfd](#), page 45
- [show hsrp mgo](#), page 46
- [show hsrp statistics](#), page 48
- [show hsrp summary](#), page 49
- [slave follow](#), page 50
- [slave primary virtual IPv4 address](#), page 52
- [slave secondary virtual IPv4 address](#), page 53
- [slave virtual mac address](#), page 54
- [timers \(hsrp\)](#), page 55
- [track \(hsrp\)](#), page 57
- [track\(object\)](#), page 59

address (hsrp)

To enable hot standby protocol for IP, use the **address (hsrp)** command in the HSRP group submode. To disable hot standby protocol for IP, use the **no** form of this command.

address {**learn**| *address*}

no address {**learn**| *address*}

Syntax Description

learn	Learns virtual IP address from peer.
<i>address</i>	Hot standby IP address.

Command Default

None

Command Modes HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read, write

Example

This example shows how to enable a group to learn the primary virtual IPv4 address from received HSRP control packets:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# address learn
RP/0/0/CPU0:router(config-hsrp-gp)#
```



Note

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
address secondary (hsrp) , on page 9	Configures the secondary virtual IPv4 address for a virtual router.

address global(HSRP)

To configure the global virtual IPv6 address for the HSRP group, use the **address global** command in the virtual router submode. To deconfigure the global virtual IPv6 address for the HSRP group, use the **no** form of this command.

address global *ipv6-address*

no address global *ipv6-address*

Syntax Description	<i>ipv6-address</i>	Global HSRP IPv6 address.
--------------------	---------------------	---------------------------

Command Default	None
-----------------	------

Command Modes	HSRP Group Submode, under the IPv6 address-family
---------------	---

Command History	Release	Modification
	Release 4.3.0	This command was introduced.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.
------------------	---

Task ID	Task ID	Operation
	hsrp	read,write

Example

This example shows how to add a global virtual IPv6 address for the HSRP group:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv6
RP/0/0/CPU0:router(config-hsrp-address-family)# hsrp 3
RP/0/0/CPU0:router(config-hsrp-virtual-router)# address global 4000::1000
RP/0/0/CPU0:router(config-hsrp-virtual-router)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

address global slave(HSRP)

To configure the global virtual IPv6 address for the slave group, use the **address global** command in the HSRP slave submode. To deconfigure the global virtual IPv6 address for the slave group, use the **no** form of this command.

address global *ipv6-address*

no address global *ipv6-address*

Syntax Description

<i>ipv6-address</i>	Global VRRP IPv6 address.
---------------------	---------------------------

Command Default

None

Command Modes

HSRP Slave Submode, under the IPv6 address-family

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read,write

Example

This example shows how to add a global virtual IPv6 address for the slave group:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv6
RP/0/0/CPU0:router(config-hsrp-address-family)# hsrp 3 slave
RP/0/0/CPU0:router(config-hsrp-virtual-router)# address global 4000::1000
RP/0/0/CPU0:router(config-hsrp-virtual-router)#
```



Note

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

address linklocal(HSRP)

To either configure the virtual link-local IPv6 address for the HSRP group or to specify that the virtual link-local IPv6 address should be enabled and calculated automatically from the virtual router virtual Media Access Control (MAC) address, use the **address linklocal** command in the HSRP group submode, under the IPv6 address-family. To deconfigure the virtual link-local IPv6 address for the HSRP group, use the **no** form of this command.

address linklocal *ipv6-address* | **autoconfig**

no address linklocal *ipv6-address* | **autoconfig**

Syntax Description

<i>ipv6-address</i>	HSRP IPv6 link-local address.
autoconfig	Autoconfigures the HSRP IPv6 link-local address.

Command Default

None

Command Modes

HSRP Group Submode, under the IPv6 address-family

Command History

Release	Modification
Release 4.3	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you configure HSRP for IPv6, you must also configure the linklocal IPv6 address using either the *ipv6-address* argument or the **autoconfig** keyword. If you configure only the global IPv6 address and commit the changes using the **commit** keyword, the router does not accept the configuration and displays an error message.

Task ID

Task ID	Operation
hsrp	read, write

Example

This example shows how to autoconfigure the HSRP IPv6 link-local address:

```
RP/0/0/CPU0:router#configure
RP/0/0/CPU0:router(config)#router hsrp
RP/0/0/CPU0:router(config-hsrp)#interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)#address-family ipv6
RP/0/0/CPU0:router(config-hsrp-address-family)#hsrp 3 version 2
RP/0/0/CPU0:router(config-hsrp-virtual-router)#address linklocal autoconfig
RP/0/0/CPU0:router(config-hsrp-virtual-router)#
```

This example shows how to configure the virtual link-local IPv6 address for the HSRP group:

```
RP/0/0/CPU0:router#configure
RP/0/0/CPU0:router(config)#router hsrp
RP/0/0/CPU0:router(config-hsrp)#interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)#address-family ipv6
RP/0/0/CPU0:router(config-hsrp-address-family)#hsrp 3
RP/0/0/CPU0:router(config-hsrp-virtual-router)#address linklocal FE80::260:3EFF:FE11:6770
RP/0/0/CPU0:router(config-hsrp-virtual-router)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

address linklocal(HSRP)

To either configure the virtual link-local IPv6 address for the slave group or to specify that the virtual link-local IPv6 address should be enabled and calculated automatically from the virtual router virtual Media Access Control (MAC) address, use the **address linklocal** command in the virtual router submenu. To deconfigure the virtual link-local IPv6 address for the slave group, use the **no** form of this command.

address linklocal *ipv6-address* | **autoconfig**

no address linklocal *ipv6-address* | **autoconfig**

Syntax Description	
<i>ipv6-address</i>	HSRP IPv6 link-local address.
autoconfig	Autoconfigures the HSRP IPv6 link-local address.

Command Default None

Command Modes HSRP Slave Submode, under the IPv6 address-family

Command History	Release	Modification
	Release 4.3	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you configure HSRP for IPv6, you must also configure the linklocal IPv6 address using either the *ipv6-address* argument or the **autoconfig** keyword. If you configure only the global IPv6 address and commit the changes using the **commit** keyword, the router does not accept the configuration and displays an error message.

Task ID	Task ID	Operation
	hsrp	read, write

Example

This example shows how to autoconfigure the HSRP IPv6 link-local address:

```
RP/0/0/CPU0:router#configure
RP/0/0/CPU0:router(config)#router hsrp
RP/0/0/CPU0:router(config-hsrp)#interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)#address-family ipv6
RP/0/0/CPU0:router(config-hsrp-address-family)#hsrp 3 slave
RP/0/0/CPU0:router(config-hsrp-virtual-router)#address linklocal autoconfig
RP/0/0/CPU0:router(config-hsrp-virtual-router)#
```

This example shows how to configure the virtual link-local IPv6 address for the slave group:

```
RP/0/0/CPU0:router#configure
RP/0/0/CPU0:router(config)#router hsrp
RP/0/0/CPU0:router(config-hsrp)#interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)#address-family ipv6
```



```
RP/0/0/CPU0:router(config-hsrp-address-family)#hsrp 3 slave
RP/0/0/CPU0:router(config-hsrp-virtual-router)#address linklocal FE80::260:3EFF:FE11:6770
RP/0/0/CPU0:router(config-hsrp-virtual-router)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

address secondary (hsrp)

To configure the secondary virtual IPv4 address for a virtual router, use the **address secondary** command in the Hot Standby Router Protocol (HSRP) virtual router submode. To deconfigure the secondary virtual IPv4 address for a virtual router, use the **no** form of this command.

address *address* **secondary**

no address *address* **secondary**

Syntax Description

secondary	Sets the secondary HSRP IP address.
<i>address</i>	HSRP IPv4 address.

Command Default

None

Command Modes

HSRP virtual router

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read, write

Example

This example shows how to set the secondary virtual IPv4 address for the virtual router:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 3 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# address 10.20.30.1 secondary
RP/0/0/CPU0:router(config-hsrp-gp)#
```



Note

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
address (hsrp) , on page 2	Enables hot standby protocol for IP.

authentication (hsrp)

To configure an authentication string for the Hot Standby Router Protocol (HSRP), use the **hsrp authentication** command in HSRP group submode. To delete an authentication string, use the **no** form of this command.

authentication *string*

no authentication [*string*]

Syntax Description

string Authentication string. It can be up to eight characters long. The default is 'cisco'.

Command Default

The default authentication string is cisco.

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced. This command replaces the hsrp authentication command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The authentication string is sent unencrypted in all HSRP messages. The same authentication string must be configured on all routers and access servers on a LAN to ensure interoperation. Authentication mismatch prevents a device from learning the designated Hot Standby IP address and the Hot Standby timer values from other routers configured with HSRP.

The **hsrp authentication** command is available for version 1 groups only

Task ID

Task ID	Operations
hsrp	read, write

This example shows how to configure “company1” as the authentication string required to allow Hot Standby routers in group 1 on tenGigE interface 0/4/0/4 to interoperate:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 1
RP/0/0/CPU0:router(config-hsrp-gp)# authentication company1
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.

Related Commands

Command	Description
show hsrp, on page 41	Displays HSRP information.

bfd fast-detect (hsrp)

To enable bidirectional forwarding(BFD) fast-detection on a HSRP interface, use the **hsrp bfd fast-detect** command in HSRP group submode. This creates a BFD session between the HSRP router and its peer, and if the session goes down while HSRP is in backup state, this will initiate a HSRP failover. To disable BFD fast-detection, use the **no** form of this command.

bfd fast-detect [**peer ipv4** *ipv4-address interface-type interface-path-id*]

no bfd fast-detect

Syntax Description

peer ipv4 <i>ipv4-address</i>	(Optional) BFD peer interface IPv4 address.
interface-type <i>interface-path-id</i>	Physical interface or virtual interface.
Note	Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

BFD is disabled.

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced. This command replaced the hsrp bfd-fast-detect command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
hsrp	read, write

This example shows how to enable bfd fast-detect:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# bfd fast-detect
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
hsrp bfd multiplier, on page 18	Configures the multiplier value for BFD.
hsrp bfd minimum-interval, on page 16	Configures the BFD minimum interval to be used for all HSRP BFD sessions on a given interface

clear hsrp statistics

To reset the Hot Standby Routing Protocol Statistics (HSRP) statistics to zero, use the **clear hsrp statistics** command in EXEC mode.

clear hsrp statistics [**interface** *interface-type interface-path-id* *group*]

Syntax Description

interface <i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<i>group</i>	Group number.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read, write

Example

This sample output is from the **clear hsrp statistics** command:

```
RP/0/0/CPU0:router# clear hsrp statistics
```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

hsrp authentication

To configure an authentication string for the Hot Standby Router Protocol (HSRP), use the **hsrp authentication** command in HSRP interface configuration mode. To delete an authentication string, use the **no** form of this command.

hsrp [*group-number*] **authentication** *string*

no hsrp [*group-number*] **authentication** [*string*]

Syntax Description

group-number	(Optional) Group number on the interface to which this authentication string applies. Default is 0.
string	Authentication string. It can be up to eight characters long. The default is 'cisco'.

Command Default

The default group number is 0.

The default authentication string is cisco.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 4.2.0	This command has been deprecated. This command was replaced with the authentication hsrp command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The authentication string is sent unencrypted in all HSRP messages. The same authentication string must be configured on all routers and access servers on a LAN to ensure interoperability. Authentication mismatch prevents a device from learning the designated Hot Standby IP address and the Hot Standby timer values from other routers configured with HSRP.

Task ID

Task ID	Operations
hsrp	read, write

This example shows how to configure “company1” as the authentication string required to allow Hot Standby routers in group 1 on Ten Gigabit Ethernet interface 0/2/0/1 to interoperate:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 authentication company1
```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

hsrp bfd fast-detect

To enable bidirectional forwarding (BFD) fast-detection on a HSRP interface, use the **hsrp bfd fast-detect** command in interface configuration mode. This creates a BFD session between the HSRP router and its peer, and if the session goes down while HSRP is in backup state, this will initiate a HSRP failover. To disable BFD fast-detection, use the **no** form of this command.

hsrp [group number] bfd fast-detect

no hsrp [group number] bfd fast-detect

Syntax Description	group number (Optional) HSRP group number. Range is 0 to 255.
---------------------------	---

Command Default BFD is disabled.

Command Modes HSRP interface configuration

Release	Modification
Release 3.9.0	This command was introduced.
Release 4.2.0	This command has been deprecated. This command was replaced with the bfd fast-detect (hsrp) command.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Operations
hsrp	read, write

This example shows how to enable bfd fast-detect:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface gig 0/1/1/0
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 bfd fast-detect
```

Related Commands

Command	Description
hsrp bfd multiplier, on page 18	Configures the multiplier value for BFD.

hsrp bfd minimum-interval

To configure the BFD minimum interval to be used for all HSRP BFD sessions on a given interface, use the **hsrp bfd minimum-interval** command in the interface configuration mode. To remove the configured

minimum-interval period and set the minimum-interval period to the default period, use the **no** form of this command.

hsrp bfd minimum-interval *interval*

no hsrp bfd minimum-interval *interval*

Syntax Description

interval	Specify the minimum-interval in milliseconds. Range is 15 to 30000.
----------	---

Command Default

Default minimum interval is 15 ms.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Minimum interval determines the frequency of sending BFD packets to BFD peers. It is the time between successive BFD packets sent for the session. Minimum interval is defined in milliseconds. The configured minimum interval applies to all BFD sessions on the interface.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to configure a minimum interval of 100 milliseconds:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface gig 0/1/1/0
RP/0/0/CPU0:router(config-hsrp-if)# hsrp bfd minimum-interval 100
```

Related Commands

Command	Description
hsrp bfd fast-detect , on page 15	Enables BFD fast-detection on a HSRP interface.
hsrp bfd multiplier , on page 18	Configures the multiplier value for BFD.

hsrp bfd multiplier

To set the BFD multiplier value, use the **hsrp bfd multiplier** command in the interface configuration mode. To remove the configured multiplier value and set the multiplier to the default value, use the **no** form of this command.

hsrp bfd multiplier *multiplier*

no hsrp bfd multiplier *multiplier*

Syntax Description

multiplier	Specifies the BFD multiplier value. Range is 2 to 50.
------------	---

Command Default

Default value is 3.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The multiplier value specifies the number of consecutive BFD packets that, if not received as expected, cause a BFD session to go down. The BFD multiplier applies to all configured BFD sessions on the interface.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to configure a BFD multiplier with multiplier value of 10:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface gig 0/1/1/0
RP/0/0/CPU0:router(config-hsrp-if)# hsrp bfd multiplier 10
```

Related Commands

Command	Description
hsrp bfd fast-detect , on page 15	Enables BFD fast-detection on a HSRP interface.

hsrp delay

To configure the activation delay for the Hot Standby Router Protocol (HSRP), use the **hsrp delay** command in HSRP interface configuration mode. To delete the activation delay, use the **no** form of this command.

hsrp delay minimum *value* **reload** *value*

no hsrp delay

Syntax Description

minimum <i>value</i>	Sets the minimum delay in seconds for every interface up event. Range is 0 to 10000.
reload <i>value</i>	Sets the reload delay in seconds for first interface up event. Range is 0 to 10000.

Command Default

minimum *value* : 1

reload *value* : 5

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.6.0	The range was changed from 1 to 10000 to 0 to 10000.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp delay** command delays the start of the HSRP finite state machine (FSM) on an interface up event to ensure that the interface is ready to pass traffic. This ensures that there are no mistaken state changes due to loss of hello packets. The minimum delay is applied on all interface up events and the reload delay is applied on the first interface event.

The values of zero must be explicitly configured to turn this feature off.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to configure a minimum delay of 10 seconds with a reload delay of 100 seconds:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface mgmtEth 0/RP0/CPU0/0
RP/0/0/CPU0:router(config-hsrp-if)# hsrp delay minimum 10 reload 100
```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

hsrp ipv4

To activate the Hot Standby Router Protocol (HSRP), use the **hsrp ipv4** command in HSRP interface configuration mode. To disable HSRP, use the **no** form of this command.

hsrp [*group-number*] **ipv4** [*ip-address* [**secondary**]]

no hsrp [*group-number*] **ipv4** [*ip-address* [**secondary**]]

Syntax Description

group-number	(Optional) Group number on the interface for which HSRP is being activated. Range is 0 to 255. Default is 0.
ip-address	(Optional) IP address of the Hot Standby router interface.
secondary	(Optional) Indicates that the IP address is a secondary Hot Standby router interface. Useful on interfaces with primary and secondary addresses; you can configure primary and secondary HSRP addresses.

Command Default

group-number : 0

HSRP is disabled by default.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp ipv4** command activates HSRP on the configured interface. If an IP address is specified, that address is used as the designated address for the Hot Standby group. If no IP address is specified, the virtual address is learned from the active router. For HSRP to elect a designated router, at least one router in the Hot Standby group must have been configured with, or must have learned, the designated address. Configuring the designated address on the active router always overrides a designated address that is currently in use.

When the **hsrp ipv4** command is enabled on an interface, the handling of proxy Address Resolution Protocol (ARP) requests is changed (unless proxy ARP was disabled). If the Hot Standby state group has been configured with or has learned the designated address, the proxy ARP requests are answered using the MAC address of the Hot Standby group. Otherwise, proxy ARP responses are suppressed.

Configuring secondary Hot Standby router IP addresses is necessary when the interface has secondary IP addresses configured and redundancy must be provided for the networks of these addresses also.

A primary address must be configured before a secondary address. Likewise, a secondary address must be unconfigured before unconfiguring a primary address. All IP addresses can be unconfigured using the **no hsrp ipv4** command.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to activate HSRP for group 1 on tenGigE interface 0/2/0/1. The IP address used by the Hot Standby group is learned using HSRP.

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:routerrouter(config-hsrp)# interface tenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 ipv4
```

Related Commands

Command	Description
hsrp redirects, on page 27	Configures ICMP redirect messages to be sent when the HSRP is configured on an interface.
show hsrp, on page 41	Displays HSRP information.

hsrp mac-address

To specify a virtual MAC address for the Hot Standby Router Protocol (HSRP), use the **hsrp mac-address** command in HSRP interface configuration mode. To revert to the standard virtual MAC address (0000.0C07.AC*n*), use the **no** form of this command.

hsrp [*group-number*] **mac-address** *address*

no hsrp [*group-number*] **mac-address**

Syntax Description

group-number	(Optional) Group number on the interface for which HSRP is being activated. Default is 0.
address	MAC address.

Command Default

group-number: 0

If this command is not configured, and the **hsrp use-bia** command is not configured, the standard virtual MAC address is used: 0000.0C07.AC*n*, where *n* is the group number in hexadecimal. This address is specified in RFC 2281, *Cisco Hot Standby Router Protocol (HSRP)*.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 4.2.0	This command has been deprecated. This command was replaced with the mac-address hsrp command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp mac-address** command is not recommended except for IBM networking environments in which first-hop redundancy is based on being able to use a virtual MAC address and in which you cannot change the first-hop addresses in the PCs that are connected to an Ethernet switch.

HSRP is used to help end stations locate the first-hop gateway for IP routing. The end stations are configured with a default gateway. However, HSRP can provide first-hop redundancy for other protocols. Some protocols, such as Advanced Peer-to-Peer Networking (APPN), use the MAC address to identify the first-hop for routing purposes. In this case, it is often necessary to specify the virtual MAC address; the virtual IP address is unimportant for these protocols.

Use the **hsrp mac-address** command to specify the virtual MAC address. The MAC address specified is used as the virtual MAC address when the router is active. This command is intended for certain APPN configurations.

This table shows the parallel terms between APPN and IP.

Table 1: APPN and IP Parallel Terms

APPN	IP
end node	host
network node	router or gateway



Note

In an APPN network, an end node is typically configured with the MAC address of the adjacent network node. Use the **hsrp mac-address** command in the routers to set the virtual MAC address to the value used in the end nodes.

Task ID

Task ID	Operations
hsrp	read, write

If the end nodes are configured to use 4000.1000.1060 as the MAC address of the network node, the command to configure the virtual MAC address is as follows:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 5 mac-address 4000.1000.1060
```

Related Commands

Command	Description
hsrp use-bia, on page 32	Configures HSRP to use the burned-in address of the interface as its virtual MAC address, instead of the preassigned MAC address.
show hsrp, on page 41	Displays HSRP information.

hsrp preempt

To configure Hot Standby Router Protocol (HSRP) preemption and preemption delay, use the **hsrp preempt** command in HSRP interface configuration mode. To restore the default values, use the **no** form of this command.

```
hsrp [ group-number ] preempt [delay seconds]
```

```
no hsrp [ group-number ] preempt [delay seconds]
```

Syntax Description

group-number	(Optional) Group number on the interface to which the other arguments in this command apply. Default is 0.
delay seconds	(Optional) Time in seconds. The <i>seconds</i> argument causes the local router to postpone taking over the active role for the specified preempt delay <i>seconds</i> value. Range is 0 to 3600 seconds (1 hour). Default is 0 seconds (no delay).

Command Default

group-number: 0

seconds: 0 seconds (if the router wants to preempt, it does immediately)

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 4.2.0	This command has been deprecated. This command was replaced with the preempt hsrp command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the **hsrp preempt** command is configured, the local router should attempt to assume control as the active router if it has a hot standby priority higher than the current active router. If the **hsrp preempt** command is not configured, the local router assumes control as the active router only if no other router is currently in the active state.

When a router first comes up, it does not have a complete routing table. If HSRP is configured to preempt, the local HSRP group may become the active router, yet it is unable to provide adequate routing services. This problem can be solved by configuring a delay before the preempting router actually preempts the currently active router.

The preempt delay *seconds* value does not apply if there is no router currently in the active state. In this case, the local router becomes active after the appropriate timeouts (see the **hsrp timers** command), regardless of the preempt *delay seconds* value.

Task ID

Task ID	Operations
hsrp	read, write

In the following example, the router waits for 300 seconds (5 minutes) after having determined that it should preempt before attempting to preempt the active router. The router might become the active router in a shorter span of time despite the configured delay if no active router is present. Only preempting the active router is delayed.

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp ipv4 172.19.108.254
RP/0/0/CPU0:router(config-hsrp-if)# hsrp preempt delay 300
```

Related Commands

Command	Description
hsrp priority, on page 25	Configures HSRP priority.
hsrp track, on page 30	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.
show hsrp, on page 41	Displays HSRP information.

hsrp priority

To configure Hot Standby Router Protocol (HSRP) priority, use the **hsrp priority** command in HSRP interface configuration mode. To restore the default values, use the **no** form of this command.

hsrp [*group-number*] **priority** *priority*

no hsrp [*group-number*] **priority** *priority*

Syntax Description

group-number	(Optional) Group number on the interface to which the priority applies. Default is 0.
priority	Priority value that prioritizes a potential Hot Standby router. Range is 1 to 255. Default is 100.

Command Default

group-number: 0
priority: 100

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was supported.
Release 4.2.0	This command has been deprecated. This command was replaced with the preempt hsrp command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The assigned priority is used to help select the active and standby routers. Assuming that preemption is enabled, the router with the highest priority becomes the designated active router. In case of ties, the interface IP addresses are compared, and the interface with the higher IP address has priority.

The priority of the device can change dynamically if an interface is configured with the **hsrp track** command and another interface on the device goes down.

If preemption is not enabled, the router may not become active even though it might have a higher priority than other HSRP routers.

Task ID

Task ID	Operations
hsrp	read, write

In the following example, the router has a priority of 120:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp ipv4 172.19.108.254
RP/0/0/CPU0:router(config-hsrp-if)# hsrp priority 120
```

Related Commands

Command	Description
hsrp preempt , on page 24	Configures HSRP preemption and preemption delay.

Command	Description
hsrp track , on page 30	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.
show hsrp , on page 41	Displays HSRP information.

hsrp redirects

To configure Internet Control Message Protocol (ICMP) redirect messages to be sent when the Hot Standby Router Protocol (HSRP) is configured on an interface, use the **hsrp redirects** command in HSRP interface configuration mode. To revert to the default, which is that ICMP messages are enabled, use the **no** form of this command.

hsrp redirects disable

no hsrp redirects disable

Syntax Description

disable	Disables the filtering of ICMP redirect messages on interfaces configured with HSRP.
---------	--

Command Default

HSRP ICMP redirects are enabled by default.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was supported.
Release 3.3.0	The disable keyword was made mandatory.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp redirects** command can be configured on a per-interface basis. When HSRP is first configured on an interface, the setting for that interface inherits the global value. With the **hsrp redirects** command is enabled, ICMP redirects messages are filtered by replacing the real IP address in the next-hop address of the redirect packet with a virtual IP address if it is known to HSRP.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to allow HSRP to filter redirect messages on tenGigE interface 0/2/0/1:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 ipv4 172.16.0.1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp redirects disable
```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

hsrp timers

To configure the time between hello packets and the time before other routers declare the active Hot Standby or standby router to be down, use the **hsrp timers** command in HSRP interface configuration mode. To restore the timers to their default values, use the **no** form of this command.

hsrp [*group-number*] **timers** { *hello-seconds* | **msec** *hello-milliseconds* } { *hold-seconds* | **msec** *hold-milliseconds* }
no hsrp [*group-number*] **timers**

Syntax Description

<i>group-number</i>	(Optional) Group number on the interface to which the timers apply. Default is 0.
<i>hello-seconds</i>	Hello interval in seconds. Range is 1 to 255. Default is 3 seconds.
msec <i>hello-milliseconds</i>	Hello interval in milliseconds. Range is 100 to 3000 milliseconds.
<i>hold-seconds</i>	Time in seconds before the active or standby router is declared to be down. Range is 1 to 255. Default is 10 seconds.
msec <i>hold-milliseconds</i>	Time in milliseconds before the active or standby router is declared to be down. Range is 100 to 3000 milliseconds.

Command Default

group-number: 0

hello-seconds: 3 seconds (If the **msec** keyword is specified, there is no default value.)

hold-seconds: 10 seconds (If the **msec** keyword is specified, there is no default value.)

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 4.2.0	This command has been deprecated. This command was replaced with the timers (hsrp) command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Nonactive routers learn timer values from the active router, unless millisecond timer values are being used. If millisecond timer values are being used, all routers must be configured with the millisecond timer values. This rule applies if either the hello time or the hold time is specified in milliseconds.

The timers configured on the active router always override any other timer settings. All routers in a Hot Standby group should use the same timer values. Normally, the hold time is greater than or equal to three times the hello time ($\text{holdtime} > 3 * \text{hellotime}$).

You must specify either the *hello-seconds* argument or the **msec** keyword and *hello-milliseconds* argument, depending on whether you want the hello time in seconds or milliseconds. You must also specify either the *hold-seconds* argument or **msec** keyword and *hold-milliseconds* argument, depending on whether you want the hold time in seconds or milliseconds.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to set, for group number 1 on Ten Gigabit Ethernet interface 0/2/0/1, the time between hello packets to 5 seconds and the time after which a router is considered to be down to 15 seconds. The configured timer values are used only if the router is active (or before they have been learned).

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 ipv4
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 timers 5 15
```

The following example shows how to set, for group number 1 on Ten Gigabit Ethernet interface 0/2/0/1, the time between hello packets to 200 milliseconds and the time after which a router is considered to be down to 1000 milliseconds. The configured timer values are always used because milliseconds have been specified.

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
```

```
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 ipv4
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 timers msec 200 msec 1000
```

Related Commands

Command	Description
show hsrp, on page 41	Displays HSRP information.

hsrp track

To configure an interface so that the Hot Standby priority changes on the basis of the availability of other interfaces, use the **hsrp track** command in HSRP interface configuration mode. To remove the tracking, use the **no** form of this command.

hsrp [*group-number*] **track** *type interface-path-id* [*priority-decrement*]

no hsrp [*group-number*] **track** *type interface-path-id* [*priority-decrement*]

Syntax Description

<i>group-number</i>	(Optional) Group number on the interface to which the tracking applies. Default is 0.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<i>priority-decrement</i>	(Optional) Amount by which the Hot Standby priority for the router is decremented (or incremented) when the interface goes down (or comes back up). Range is 1 to 255.

Command Default

group-number: 0

priority-decrement: 10

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Release	Modification
Release 4.2.0	This command has been deprecated. This command was replaced with the track (hsrp) command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp track** command ties the Hot Standby priority of the router to the availability of its interfaces. It is useful for tracking interfaces that are not configured for the Hot Standby Router Protocol (HSRP). Only IP interfaces are tracked. A tracked interface is up if IP on that interface is up. Otherwise, the tracked interface is down.

When a tracked interface goes down, the Hot Standby priority decreases by 10. If an interface is not tracked, its state changes do not affect the Hot Standby priority. For each group configured for Hot Standby, you can configure a separate list of interfaces to be tracked.

The optional *priority-decrement* argument specifies by how much to decrement the Hot Standby priority when a tracked interface goes down. When the tracked interface comes back up, the priority is incremented by the same amount.

When multiple tracked interfaces are down and *priority-decrement* values have been configured, these configured priority decrements are cumulative. If tracked interfaces are down, but none of them were configured with priority decrements, the default decrement is 10 and it is cumulative.

The **hsrp preempt** command must be used in conjunction with this command on all routers in the group whenever the best available router should be used to forward packets. If the **hsrp preempt** command is not used, then the active router stays active, regardless of the current priorities of the other HSRP routers.

Task ID

Task ID	Operations
hsrp	read, write

In the following example, Ten Gigabit Ethernet interface 0/2/0/1 tracks interface 0/1/0/1 and 0/3/0/1. If one or both of these two interfaces go down, the Hot Standby priority of the router decreases by 10. Because the default Hot Standby priority is 100, the priority becomes 90 when one of the tracked interfaces goes down and the priority becomes 80 when both go down.

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface TenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp track TenGigE 0/1/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp track TenGigE 0/3/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp preempt
RP/0/0/CPU0:router(config-hsrp-if)# hsrp ipv4 192.92.72.46
```

Related Commands

Command	Description
hsrp preempt , on page 24	Configures HSRP preemption and preemption delay.
hsrp priority , on page 25	Configures HSRP priority.
show hsrp , on page 41	Displays HSRP information.

hsrp use-bia

To configure the Hot Standby Router Protocol (HSRP) to use the burned-in address of the interface as its virtual MAC address, instead of the preassigned MAC address or the functional address, use the **hsrp use-bia** command in HSRP interface configuration mode. To restore the default virtual MAC address, use the **no** form of this command.

hsrp use-bia

no hsrp use-bia

Command Default

HSRP uses the preassigned MAC address on Ethernet.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

It is desirable to configure the **hsrp use-bia** command on an interface if there are devices that reject Address Resolution Protocol (ARP) replies with source hardware addresses set to a functional address.

Task ID

Task ID	Operations
hsrp	read, write

In the following example, the burned-in address of tenGigE interface 0/2/0/1 will be the virtual MAC address mapped to the virtual IP address for all Hot Standby groups configured on tenGigE interface 0/1/0/1:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp use-bia
```

Related Commands

Command	Description
hsrp mac-address, on page 22	Specifies a virtual MAC address for HSRP.
show hsrp, on page 41	Displays HSRP information.

interface (HSRP)

To enable Hot Standby Router Protocol (HSRP) interface configuration command mode, use the **interface** command in router configuration mode. To terminate interface mode, use the **no** form of this command.

interface *type interface-path-id*

no interface *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

HSRP is disabled.

Command Modes

Router HSRP configuration

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All the commands used to configure HSRP are used in HSRP interface configuration mode.

Task ID

Task ID	Operations
hsrp	read, write

The following example show how to enable HSRP interface configuration mode on tenGigE 0/2/0/1:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)#
```

Related Commands

Command	Description
router hsrp, on page 39	Enables HSRP.

mac-address (hsrp)

To specify a virtual MAC address for the Hot Standby Router Protocol (HSRP), use the **hsrp mac-address** command in HSRP group submode. To revert to the standard virtual MAC address (0000.0C07.AC*n*), use the **no** form of this command.

mac-address *address*

no mac-address

Syntax Description

address	MAC address.
---------	--------------

Command Default

If this command is not configured, and the **hsrp use-bia** command is not configured, the standard virtual MAC address is used: 0000.0C07.AC*n*, where *n* is the group number in hexadecimal. This address is specified in RFC 2281, *Cisco Hot Standby Router Protocol (HSRP)*.

Command Modes

HSRP interface configuration

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp mac-address** command is not recommended except for IBM networking environments in which first-hop redundancy is based on being able to use a virtual MAC address and in which you cannot change the first-hop addresses in the PCs that are connected to an Ethernet switch.

HSRP is used to help end stations locate the first-hop gateway for IP routing. The end stations are configured with a default gateway. However, HSRP can provide first-hop redundancy for other protocols. Some protocols, such as Advanced Peer-to-Peer Networking (APPN), use the MAC address to identify the first-hop for routing purposes. In this case, it is often necessary to specify the virtual MAC address; the virtual IP address is unimportant for these protocols.

Use the **hsrp mac-address** command to specify the virtual MAC address. The MAC address specified is used as the virtual MAC address when the router is active. This command is intended for certain APPN configurations.

This table shows the parallel terms between APPN and IP.

Table 2: APPN and IP Parallel Terms

APPN	IP
end node	host
network node	router or gateway

**Note**

In an APPN network, an end node is typically configured with the MAC address of the adjacent network node. Use the **hsrp mac-address** command in the routers to set the virtual MAC address to the value used in the end nodes.

Task ID

Task ID	Operations
hsrp	read, write

If the end nodes are configured to use 4000.1000.1060 as the MAC address of the network node, the command to configure the virtual MAC address is as follows:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# mac-address 4000.1000.1060
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
hsrp use-bia , on page 32	Configures HSRP to use the burned-in address of the interface as its virtual MAC address, instead of the preassigned MAC address.
show hsrp , on page 41	Displays HSRP information.

preempt (hsrp)

To configure Hot Standby Router Protocol (HSRP) preemption and preemption delay, use the **hsrp preempt** command in HSRP group submode. To restore the default values, use the **no** form of this command.

preempt [*delay seconds*]

no preempt [*delay seconds*]

Syntax Description

delay seconds (Optional) Time in seconds. The *seconds* argument causes the local router to postpone the taking over the active role for the specified preempt delay *seconds* value. Range is from 0 to 3600 (1 hour). Default is 0 (no delay).

Command Default

The default delay is 0.

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced. This command replaced the hsrp preempt command.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the **hsrp preempt** command is configured, the local router should attempt to assume control as the active router, if it has a hot standby priority higher than the current active router. If the hsrp preempt command is not configured, the local router assumes control as the active router only if no other router is currently in the active state.

When a router first comes up, it does not have a complete routing table. If HSRP is configured to preempt, the local HSRP group may become the active router, yet it is unable to provide adequate routing services. This problem can be solved by configuring a delay before the preempting router actually preempts the currently active router.

The preempt delay *seconds* value does not apply if there is no router currently in the active state. In this case, the local router becomes active after the appropriate timeouts (see the **hsrp timers** command), regardless of the preempt *delay seconds* value.

Task ID

Task ID	Operations
hsrp	read, write

This example, the router waits for 300 seconds (5 minutes) after having determined that it should preempt before attempting to preempt the active router. The router might become the active router in a shorter span of time despite the configured delay, if no active router is present. Only preempting the active router is delayed.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# preempt delay 300
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
hsrp priority , on page 25	Configures HSRP priority.
hsrp track , on page 30	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.

Command	Description
show hsrp , on page 41	Displays HSRP information.

priority (hsrp)

To configure Hot Standby Router Protocol (HSRP) priority, use the **priority** command in HSRP group submode. To restore the default values, use the **no** form of this command.

priority *priority*

no priority *priority*

Syntax Description

<i>priority</i>	Priority value that prioritizes a potential Hot Standby router. Range is from 1 to 255. Default is 100.
-----------------	---

Command Default

The default priority is 100.

Command Modes

HSRP interface configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced. This command replaced the hsrp priority command

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The assigned priority is used to help select the active and standby routers. Assuming that preemption is enabled, the router with the highest priority becomes the designated active router. In case of ties, the interface IP addresses are compared, and the interface with the higher IP address has priority.

The priority of the device can change dynamically if an interface is configured with the **hsrp track** command and another interface on the device goes down.

If preemption is not enabled, the router may not become active even though it might have a higher priority than other HSRP routers.

Task ID

Task ID	Operations
hsrp	read, write

In this example, the router has a priority of 120:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-if)# priority 120
RP/0/0/CPU0:router(config-hsrp-if)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
hsrp preempt , on page 24	Configures HSRP preemption and preemption delay.
hsrp track , on page 30	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.
show hsrp , on page 41	Displays HSRP information.

router hsrp

To enable the Hot Standby Router Protocol (HSRP), use the **router hsrp** command in global configuration mode. To disable HSRP, use the **no** form of this command.

router hsrp

no router hsrp

Syntax Description

This command has no keywords or arguments.

Command Default

HSRP is disabled.

session name

Command Modes

global configuration

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

HSRP configuration commands must be configured in the HSRP interface configuration mode.

Task ID

Task ID	Operations
hsrp	read, write

The following example shows how to configure an HSRP redundancy process that contains a virtual router group 1 on Ten Gigabit Ethernet 0/2/0/1:

```
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/2/0/1
RP/0/0/CPU0:router(config-hsrp-if)# hsrp 1 priority 254
```

session name

To configure an HSRP session name, use the **session name** command in the HSRP group submode. To deconfigure an HSRP session name, use the **no** form of this command.

name *name*

Syntax Description

<i>name</i>	MGO session name
-------------	------------------

Command Default

None

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read

Example

This example shows how to configure an HSRP session name.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# name s1
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
mac-address (hsrp) , on page 34	Configures a virtual MAC address for the Hot Standby Router Protocol (HSRP).

show hsrp

To display Hot Standby Router Protocol (HSRP) information, use the **show hsrp** command in EXEC mode.

show hsrp [*interface interface-type interface-path-id*] [*group-number*] [**brief** | **detail**]

Syntax Description

interface <i>interface-type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<i>group-number</i>	(Optional) Group number on the interface for which output is displayed.
brief	(Optional) A single line of output summarizes each standby group. The brief keyword is the default if detail is not specified.
detail	(Optional) This keyword has the same effect as not specifying brief ; more output is provided.
	(Optional) After this vertical bar (), specify one of these output modifiers and a keyword from the output: <ul style="list-style-type: none"> • begin —Begins the output from the word that you specify. • exclude —Excludes lines that match the word that you specify. • include —Includes lines that match the word that you specify.

Command Default

By default, a single line of output summarizing each standby group is displayed.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show hsrp** command to display HSRP information.

If you want to specify a value for the *group-number* argument, you must also specify an interface *type* and *number*.

Task ID

Task ID	Operations
hsrp	read

This is sample output from the **show hsrp detail** command:

```
RP/0/0/CPU0:router# show hsrp detail
0/4/0/0 - Group 1
  Local state is Active, priority 100
  Hello time 3 sec holdtime 10 sec
  Next hello sent in 0.539
  Minimum delay 1 sec, reload delay 5 sec
  BFD enabled: state none, interval 15 ms multiplier 3
  Hot standby IP address is 4.0.0.100 configured
  Active router is local
  Standby router is unknown expired
  Standby virtual mac address is 0000.0c07.ac01
  2 state changes, last state change 00:05:20
```

This table describes the significant fields shown in the display.

Table 3: show hsrp Command Field Descriptions

Field	Description
TenGigE E0/2/0/4	Interface type and number and Hot Standby group number for the interface.
Local state is	State of local networking device; can be one of the following: <ul style="list-style-type: none"> • Active—Current Hot Standby router. • Standby—Router next in line to be the Hot Standby router. • Speak—Router is sending packets to claim the active or standby role. • Listen—Router is neither active nor standby, but if no messages are received from the active or standby router, it will start to “speak.” • Learn—Router is neither active nor standby, nor does it have enough information to attempt to claim the active or standby roles. • Init—Router is not yet ready to participate in HSRP, possibly because the associated interface is not up.
Hello time	Current time (in seconds) between sending of hello packets, learned dynamically from the hello packets received from the active Hot Standby router.

Field	Description
holdtime	Current time (in seconds) before other routers declare the active or standby router to be down, learned dynamically from the hello packets received from the active Hot Standby router.
Next hello sent in	Time in which the software will send the next hello packet (in hours:minutes:seconds).
BFD enabled	Displays BFD related information (with multiplier and minimum interval details)
Hot standby IP address is configured	IP address of the current Hot Standby router. The word “configured” indicates that this address is known through the hsrp ip command. Otherwise, the address was learned dynamically through HSRP hello packets from other routers that do have the HSRP IP address configured.
Active router is	Value can be “local” or an IP address. Address of the current active Hot Standby router.
Standby router is	Value can be “local” or an IP address of the standby router (the router that is next in line to be the Hot Standby router).
Standby virtual mac address is	MAC address associated with the standby group address.
state changes	Number of times the router changed the standby state.
last state change	Time (in hours:minutes:seconds) expired since the last state change.
Tracking interface states for	List of interfaces that are being tracked and their corresponding states. Based on the hsrp track command.
Priority decrement	Value by which the standby priority is decremented or incremented when the tracked interface goes down or up, respectively. Default is 10.

Related Commands

Command	Description
hsrp authentication , on page 14	Configures an authentication string for HSRP.
hsrp ipv4 , on page 20	Activates the HSRP.

Command	Description
hsrp mac-address , on page 22	Specifies a virtual MAC address for HSRP.
hsrp preempt , on page 24	Configures HSRP preemption and preemption delay.
hsrp priority , on page 25	Configures HSRP priority.
hsrp timers , on page 28	Configures the time between hello packets and the time before other routers declare the active Hot Standby or standby router to be down.
hsrp track , on page 30	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.
hsrp use-bia , on page 32	Configures HSRP to use the burned-in address of the interface as its virtual MAC address, instead of the preassigned MAC address.

show hsrp bfd

To display Hot Standby Router Protocol (HSRP) bfd information across all interfaces, use the **show hsrp bfd** command in EXEC mode.

show hsrp bfd [*interface-type interface-path-id ip-address*]

Syntax Description

<i>interface-type</i>	(Optional) Physical interface or virtual interface.
<i>interface-path-id</i>	<p>Note Use the show interfaces command to see a list of all interfaces currently configured on the router.</p> <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
<i>ip-address</i>	(Optional) Destination IP address for BFD session.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read

Example

This example shows Hot Standby Router Protocol (HSRP) bfd information across all interfaces.

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

BFD Interface	Destination IP	State	Intv	Mult	HSRP Interface	Grp
Gi0/3/0/2	10.0.0.2	up	100	3	Gi0/3/0/2	1
					Gi0/3/0/2	2
Gi0/3/0/2	10.0.0.3	inactive	100	3	Gi0/3/0/2	3
					Gi0/3/0/2	6
Gi0/3/0/3.1	10.0.1.2	down	15	3	Gi0/3/0/2	4

This example shows Hot Standby Router Protocol (HSRP) bfd information for the 0/3/0/2 interface.

```
RP/0/0/CPU0:router# show hsrp bfd gigabitethernet 0/3/0/2 10.0.0.2
```

BFD Interface	Destination IP	State	Intv	Mult	HSRP Interface	Grp
Gi0/3/0/2	10.0.0.2	up	100	3	Gi0/3/0/2	1
					Gi0/3/0/2	2

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

show hsrp mgo

To display Hot Standby Router Protocol (HSRP) mgo information across all interfaces, use the **show hsrp mgo** command in EXEC mode.

```
show hsrp mgo [brief | session-name]
```

Syntax Description

brief	(Optional) Displays information in a brief format.
--------------	--

session-name (Optional) Display information for a single MGO Session.

Command Default None

Command Modes EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read

Example

This example shows Hot Standby Router Protocol (HSRP) mgo information for interface HSRP3.

```
RP/0/0/CPU0:router# show hsrp mgo HSRP3
HSRP3
  Primary group Bundle-Ether1.1 IPv4 group 1
  State is Active
  Slave groups:
    Interface          Grp
    Bundle-Ether1.2    2
    Bundle-Ether1.3    3
    Bundle-Ether1.4    4
    Bundle-Ether1.5    5
```

This example shows Hot Standby Router Protocol (HSRP) mgo information across all interfaces in a brief format.

```
RP/0/0/CPU0:router# show hsrp mgo brief
Name          Interface      AF  Grp  State Slaves
HSRP1         Gi0/0/0/1     IPv4  1   Active  100
HSRP2         Te0/1/0/0.1   IPv4  2   Standby  50
HSRP3         BE1            IPv4  1   Active   4
HSRP4         BE1            IPv6  10  Active  11
```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

show hsrp statistics

To display Hot Standby Router Protocol (HSRP) statistics information across all interfaces, use the **show hsrp statistics** command in EXEC mode.

show hsrp [*interface-type interface-path-id*] *group-number* **statistics**

Syntax Description

interface-type interface-path-id Physical interface or virtual interface.

Note Use the show interfaces command to see a list of all interfaces currently configured on the router.

For more information about the syntax for the router, use the question mark (?) online help function.

group-number (Optional) Group number of the interface.

Command Modes

EXEC

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read

Example

This sample output is from the **show hsrp statistics** command:

```

RP/0/0/CPU0:router# show hsrp statistics
Protocol:
  Transitions to Active           2
  Transitions to Standby         2
  Transitions to Speak           0
  Transitions to Listen          2
  Transitions to Learn           0
  Transitions to Init            0

Packets Sent:                    12
  Hello:                         7
  Resign:                         0
  Coup:                           2
  Adver:                          3

Valid Packets Received:          13
  Hello:                         8
  Resign:                         2
  Coup:                           0
  Adver:                          3

Invalid packets received:        0
  Too long:                       0
  Too short:                       0
  Mismatching/unsupported versions: 0
  Invalid opcode:                  0
  Unknown group:                   0
  Inoperational group:             0
  Conflicting Source IP:           0
  Failed Authentication:           2
  Invalid Hello Time:              0
  Mismatching Virtual IP:         0

```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

show hsrp summary

To display Hot Standby Router Protocol (HSRP) summary information across all interfaces, use the **show hsrp summary** command in EXEC mode.

show hsrp summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes EXEC

Command History	Release	Modification
	Release 4.2.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	hsrp	read

Example

This sample output is from the **show hsrp summary** command:

```
RP/0/0/CPU0:router# show hsrp summary
              Groups                VIPs
State  Sessions Slaves Total      Up   Down  Total
-----
ALL           60    900   960    860 2020  2880

ACTIVE       10    190   200    200  300   500
STANDBY      15    235   250    250  600   850
SPEAK        10    190   200    200  400   600
LISTEN       10    190   200    200  400   600
LEARN         5     5    10     10   20    30
INIT         10    90   100     0   300   300

48  HSRP IPv4 interfaces (43 up, 5 down)
5   Tracked IPv4 interfaces (4 up, 1 down)
5   BFD sessions (3 up, 2 down)
```

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

slave follow

To instruct the slave group to inherit its state from a specified group, use the **slave follow** command in HSRP slave submode.

follow *mgo-session-name*

Syntax Description	<i>mgo-session-name</i>	Name of the MGO session from which the slave group will inherit the state.
---------------------------	-------------------------	--

Command Default None

Command Modes HSRP Slave Submode

Command History	Release	Modification
	Release 4.2.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	hsrp	read, write

Example

This example shows how to instruct the slave group to inherit its state from a specified group.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp slave
RP/0/0/CPU0:router(config-hsrp-slave)# follow m1
```

Related Commands

Command	Description
slave virtual mac address, on page 54	Configures the virtual MAC address for the slave group.

slave primary virtual IPv4 address

To configure the primary virtual IPv4 address for the slave group, use the **slave primary virtual IPv4 address** command in the HSRP slave submode.

address *ip-address*

Syntax Description	<i>ip-address</i>	IP address of the Hot Standby router interface.
--------------------	-------------------	---

Command Default None

Command Modes HSRP Slave Submode

Command History	Release	Modification
	Release 4.2.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	hsrp	read, write

Example

This example shows how to configure the primary virtual IPv4 address for the slave group.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp slave
RP/0/0/CPU0:router(config-hsrp-slave)# address 10.2.1.4
```

Related Commands

Command	Description
slave follow , on page 50	Instructs the slave group to inherit its state from a specified group.
slave virtual mac address , on page 54	Configures the virtual MAC address for the slave group.

slave secondary virtual IPv4 address

To configure the secondary virtual IPv4 address for the slave group, use the **slave secondary virtual IPv4 address** command in the HSRP slave submode.

address *ip-address* **secondary**

Syntax Description

<i>ip-address</i>	IP address of the Hot Standby router interface.
secondary	Sets the secondary hot standby IP address.

Command Default

None

Command Modes

HSRP Slave Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
hsrp	read, write

Example

This example shows how to configure the secondary virtual IPv4 address for the slave group.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp slave
RP/0/0/CPU0:router(config-hsrp-slave)# address 10.2.1.4 secondary
```

Related Commands

Command	Description
slave follow , on page 50	Instructs the slave group to inherit its state from a specified group.
slave virtual mac address , on page 54	Configures the virtual MAC address for the slave group.

slave virtual mac address

To configure the virtual MAC address for the slave group, use the **slave virtual mac address** command in the HSRP slave submode.

mac-address *address*

Syntax Description

<i>address</i>	48-bit hardware address of ARP entry.
----------------	---------------------------------------

Command Default

None

Command Modes

HSRP Slave Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operation
	hsrp	read, write

Example

This example shows how to configure the virtual MAC address for the slave group.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp slave
RP/0/0/CPU0:router(config-hsrp-slave)# mac-address 10.2.4
```

Related Commands

Command	Description
slave follow , on page 50	Instructs the slave group to inherit its state from a specified group.

timers (hsrp)

To configure the time between hello packets and the time before other routers declare the active Hot Standby or standby router to be down, use the **hsrp timers** command in HSRP group submode. To restore the timers to their default values, use the **no** form of this command.

timers {*hello-seconds*| **msec** *hello-milliseconds*} {*hold-seconds*| **msec** *hold-milliseconds*}

no timers

Syntax Description

<i>hello-seconds</i>	Hello interval in seconds. Range is from 1 to 255. Default is 3.
msec <i>hello-milliseconds</i>	Hello interval in milliseconds. Range is from 100 to 3000.
<i>hold-seconds</i>	Time in seconds before the active or standby router is declared to be down. Range is from 1 to 255. Default is 10.
msec <i>hold-milliseconds</i>	Time in milliseconds before the active or standby router is declared to be down. Range is from 100 to 3000.

Command Default

The default hello-seconds is 3. (If the **msec** keyword is specified, there is no default value.)

The default hold-seconds is 10. (If the **msec** keyword is specified, there is no default value.)

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Nonactive routers learn timer values from the active router, unless millisecond timer values are being used. If millisecond timer values are being used, all routers must be configured with the millisecond timer values. This rule applies if either the hello time or the hold time is specified in milliseconds.

The timers configured on the active router always override any other timer settings. All routers in a Hot Standby group should use the same timer values. Normally, the hold time is greater than or equal to three times the hello time ($\text{holdtime} > 3 * \text{hellotime}$).

You must specify either the *hello-seconds* argument or the **msec** keyword and *hello-milliseconds* argument, depending on whether you want the hello time in seconds or milliseconds. You must also specify either the *hold-seconds* argument or **msec** keyword and *hold-milliseconds* argument, depending on whether you want the hold time in seconds or milliseconds.

Task ID

Task ID	Operations
hsrp	read, write

This example shows how to set, for group number 1 on Ten Gigabit Ethernet interface 0/2/0/1, the time between hello packets to 5 seconds and the time after which a router is considered to be down to 15 seconds. The configured timer values are used only if the router is active (or before they have been learned).

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1
RP/0/0/CPU0:router(config-hsrp-gp)# timers 5 15
RP/0/0/CPU0:router(config-hsrp-gp)#
```

This example shows how to set, for group number 1 on Ten Gigabit Ethernet interface 0/2/0/1, the time between hello packets to 200 milliseconds and the time after which a router is considered to be down to 1000 milliseconds. The configured timer values are always used because milliseconds have been specified.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
```



```
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# timers msec 200 msec 1000
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
show hsrp , on page 41	Displays HSRP information.

track (hsrp)

To configure an interface so that the Hot Standby priority changes on the basis of the availability of other interfaces, use the **hsrp track** command in HSRP group submode. To remove the tracking, use the **no** form of this command.

track *type interface-path-id* [*priority-decrement*]

no track *type interface-path-id* [*priority-decrement*]

Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface.
<i>interface-path-id</i>	Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<i>priority-decrement</i>	(Optional) Amount by which the Hot Standby priority for the router is decremented (or incremented) when the interface goes down (or comes back up). Range is 1 to 255.

Command Default

The default priority-decrement is 10.

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.0	This command was introduced. This command replaced the hsrp track command.
	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hsrp track** command ties the Hot Standby priority of the router to the availability of its interfaces. It is useful for tracking interfaces that are not configured for the Hot Standby Router Protocol (HSRP). Only IP interfaces are tracked. A tracked interface is up if IP on that interface is up. Otherwise, the tracked interface is down.

When a tracked interface goes down, the Hot Standby priority decreases by 10. If an interface is not tracked, its state changes do not affect the Hot Standby priority. For each group configured for Hot Standby, you can configure a separate list of interfaces to be tracked.

The optional *priority-decrement* argument specifies by how much to decrement the Hot Standby priority when a tracked interface goes down. When the tracked interface comes back up, the priority is incremented by the same amount.

When multiple tracked interfaces are down and *priority-decrement* values have been configured, these configured priority decrements are cumulative. If tracked interfaces are down, but none of them were configured with priority decrements, the default decrement is 10 and it is cumulative.

The **hsrp preempt** command must be used in conjunction with this command on all routers in the group whenever the best available router should be used to forward packets. If the **hsrp preempt** command is not used, then the active router stays active, regardless of the current priorities of the other HSRP routers.

Task ID

Task ID	Operations
hsrp	read, write

This example shows how to configure an interface so that the Hot Standby priority changes on the basis of the availability of other interfaces.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# track tenGigE 0/4/0/4 2
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
hsrp preempt , on page 24	Configures HSRP preemption and preemption delay.
hsrp priority , on page 25	Configures HSRP priority.
show hsrp , on page 41	Displays HSRP information.

track(object)

To enable tracking of a named object with the specified decrement, use the **track (object)** command in HSRP group submode. To remove the tracking, use the **no** form of this command.

track object *name* [*priority-decrement*]

no track object *name* [*priority-decrement*]

Syntax Description

object name	Object tracking. Name of the object to be tracked.
priority-decrement	(Optional) Amount by which the Hot Standby priority for the router is decremented (or incremented) when the interface goes down (or comes back up). Range is 1 to 255.

Command Default

The default priority-decrement is 10.

Command Modes

HSRP Group Submode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
hsrp	read, write

This example shows how to configure object tracking under the HSRP group submode.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# router hsrp
RP/0/0/CPU0:router(config-hsrp)# interface tenGigE 0/4/0/4
RP/0/0/CPU0:router(config-hsrp-if)# address-family ipv4
RP/0/0/CPU0:router(config-hsrp-ipv4)# hsrp 1 version 2
RP/0/0/CPU0:router(config-hsrp-gp)# track object t1 2
RP/0/0/CPU0:router(config-hsrp-gp)#
```

**Note**

- The **version** keyword is available only if IPv4 address-family is selected. By default, version is set to 2 for IPv6 address families.
- HSRP version 2 provides an extended group range of 0-4095.

Related Commands

Command	Description
hsrp preempt , on page 24	Configures HSRP preemption and preemption delay.
hsrp priority , on page 25	Configures HSRP priority.
show hsrp , on page 41	Displays HSRP information.