standby arp gratuitous through track vrrp

standby arp gratuitous

To configure the number of gratuitous Address Resolution Protocol (ARP) packets sent by a Hot Standby Router Protocol (HSRP) group when it transitions to the active state, and how often the ARP packets are sent, use the **standby arp gratuitous** command in interface configuration mode. To configure HSRP to send the default number of gratuitous of ARP packets at the default interval when an HSRP group changes to the active state, use the **no** form of this command.

standby arp gratuitous [**count** *number*] [**interval** *seconds*]
no standby arp gratuitous

Syntax Description		
count *number*	(Optional) Specifies the number of gratuitous ARP packets to send after an HSRP group is activated. The range is 0 to 60. The default is 2. 0 sends continuous gratuitous ARP packets.	
interval *seconds*	(Optional) Specifies the interval, in seconds, at which HSRP gratuitous ARP packets are sent. The range is 3 to 1800 seconds. The default is 3 seconds.	

Command Default
HSRP sends one gratuitous ARP packet when a group becomes active, and then another two and four seconds later.

Command Modes
Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SXI	This command was introduced.

Usage Guidelines
You can configure HSRP to send a gratuitous ARP packet from one or more HSRP active groups. By default, HSRP sends one gratuitous ARP packet when a group becomes active, and then another two and four seconds later.

Use the **standby arp gratuitous** command in interface configuration mode to configure the number of gratuitous ARP packets sent by an Active HSRP group, and how often they are sent. The **count** and **interval** keywords can be specified in any order. If both the **count** and **interval** keywords are set to their default values, the **standby arp gratuitous** command does not appear in the running configuration.

Use the **standby send arp** command in EXEC mode to configure HSRP to send a single gratuitous ARP packet when an HSRP group becomes active.

Examples
The following example shows how to configure HSRP to send three gratuitous ARP packets every 4 seconds:

```
Router(config-if)# standby arp gratuitous count 3 interval 4
```

Related Commands	Command	Description
	debug standby events	Displays events related to HSRP.

Command	Description
show standby arp gratuitous	Displays the number of gratuitous ARP packets sent by HSRP and how often they are sent.
standby send arp	Configures HSRP to send a single gratuitous ARP packet for each active HSRP group.

standby authentication

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

standby [*group-number*] **authentication** {**text** *string* | **md5** {**key-string** [{**0** | **7**}] *key* [**timeout** *seconds*] | **key-chain** *name-of-chain*}}

no standby [*group-number*] **authentication** {**text** *string* | **md5** {**key-string** [{**0** | **7**}] *key* [**timeout** *seconds*] | **key-chain** *name-of-chain*}}

Syntax Description

group-number	(Optional) Group number on the interface to which this authentication string applies. The default group number is 0.
text *string*	Authentication string. It can be up to eight characters long. The default string is cisco.
md5	Message Digest 5 (MD5) authentication.
key-string *key*	Specifies the secret key for MD5 authentication. The key can contain up to 64 characters. We recommend using at least 16 characters.
0	(Optional) Unencrypted key. If no prefix is specified, the text also is unencrypted.
7	(Optional) Encrypted key.
timeout *seconds*	(Optional) Duration in seconds that HSRP will accept message digests based on both the old and new keys.
key-chain *name-of-chain*	Identifies a group of authentication keys.

Command Default   No text authentication string is configured.

Command Modes   Interface configuration (config-if)

Command History

Release	Modification
10.0	This command was introduced.
12.1	The **text** keyword was added.
12.3(2)T	The **md5** keyword and associated parameters were added.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The authentication string is sent unencrypted in all HSRP messages when using the **standby authentication text** *string* option. The same authentication string must be configured on all routers and access servers on a cable 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.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

If password encryption is configured with the **service password-encryption** command, the software saves the key string as encrypted text.

The **timeout** *seconds* is the duration that the HSRP group will accept message digests based on both the old and new keys. This allows time for configuration of all routers in a group with the new key. HSRP route flapping can be minimized by changing the keys on all the routers, provided that the active router is changed last. The active router should have its key string changed no later than one holdtime period, specified by the **standby timers** interface configuration command, after the non-active routers. This procedure ensures that the non-active routers do not time out the active router.

Examples

The following example configures "company1" as the authentication string required to allow Hot Standby routers in group 1 to interoperate:

```
Router(config)# interface ethernet 0
Router(config-if)# standby 1 authentication text company1
```

The following example configures MD5 authentication using a key string named "345890":

```
Router(config)# interface Ethernet0/1
Router(config-if)# standby 1 ip 10.21.0.12
Router(config-if)# standby 1 priority 110
Router(config-if)# standby 1 preempt
Router(config-if)# standby 1 authentication md5 key-string 345890 timeout 30
```

The following example configures MD5 authentication using a key chain. HSRP queries the key chain "hsrp1" to obtain the current live key and key ID for the specified key chain:

```
Router(config)# key chain hsrp1
Router(config-keychain)#  key 1
Router(config-keychain-key)# key-string 543210
Router(config-keychain-key)# exit
Router(config)# interface Ethernet0/1
Router(config-if)# standby 1 ip 10.21.0.10
Router(config-if)# standby 1 priority 110
Router(config-if)# standby 1 preempt
Router(config-if)# standby 1 authentication md5 key-chain hsrp1
```

Related Commands

Command	Description
service password-encryption	Encrypts passwords.
standby timers	Configures the time between hello packets and the time before other routers declare the active Hot Standby or standby router to be down.

standby bfd

To reenable Hot Standby Router Protocol (HSRP) Bidirectional Forwarding Detection (BFD) peering if it has been disabled on an interface, use the **standby bfd** command in interface configuration mode. To disable HSRP support for BFD, use the **no** form of this command.

standby bfd
no standby bfd

Syntax Description   This command has no arguments or keywords.

Command Default   HSRP support for BFD is enabled.

Command Modes   Interface configuration

Command History

Release	Modification
12.4(11)T	This command was introduced.

Usage Guidelines   HSRP BFD peering is enabled by default when the router is configured for BFD. Use this command to reenable HSRP BFD peering on the specified interface when it has previously been manually disabled.

To enable HSRP BFD peering globally on the router, use the **standby bfd all-interfaces** command in global configuration mode.

Examples   The following example shows how to reenable HSRP BFD peering if it has been disabled:

```
Router(config)# interface ethernet0/0
Router(config-if)# standby bfd
```

Related Commands

Command	Description
bfd	Sets the baseline BFD session parameters on an interface.
debug standby events neighbor	Displays HSRP neighbor events.
show bfd neighbor	Displays a line-by-line listing of existing BFD adjacencies.
show standby	Displays HSRP information.
show standby neighbors	Displays information about HSRP neighbors.
standby bfd all-interfaces	Reenables HSRP BFD peering on all interfaces if it has been disabled.
standby ip	Activates HSRP.

standby bfd all-interfaces

To reenable Hot Standby Router Protocol (HSRP) Bidirectional Forwarding Detection (BFD) peering on all interfaces if it has been disabled, use the **standby bfd all-interfaces** command in global configuration mode. To disable HSRP support for BFD peering, use the **no** form of this command.

standby bfd all-interfaces
no standby bfd all-interfaces

Syntax Description	This command has no arguments or keywords.
Command Default	HSRP BFD peering is enabled.
Command Modes	Global configuration

Command History

Release	Modification
12.4(11)T	This command was introduced.

Usage Guidelines

The HSRP BFD peering feature introduces BFD in the HSRP group member health monitoring system. Previously, group member monitoring relied exclusively on HSRP multicast messages, which are relatively large and consume CPU memory to produce and check. In architectures where a single interface hosts a large number of groups, there is a need for a protocol with low CPU memory consumption and processing overhead. BFD addresses this issue and offers subsecond health monitoring (failure detection in milliseconds) with a relatively low CPU impact. This command is enabled by default.

To enable HSRP support for BFD on a per-interface basis, use the **standby bfd** command in interface configuration mode.

Examples

The following example shows how to reenable HSRP BFD peering if it has been disabled on a router:

```
Router(config)# standby bfd all-interfaces
```

Related Commands

Command	Description
bfd	Sets the baseline BFD session parameters on an interface.
debug standby events neighbor	Displays HSRP neighbor events.
show bfd neighbor	Displays a line-by-line listing of existing BFD adjacencies.
show standby	Displays information about HSRP.
show standby neighbors	Displays information about HSRP neighbors.
standby bfd	Reenables HSRP BFD peering for a specified interface if it has been disabled.
standby ip	Activates HSRP.

standby delay minimum reload

To configure the delay period before the initialization of Hot Standby Router Protocol (HSRP) groups, use the **standby delay minimum reload** command in interface configuration mode. To disable the delay period, use the **no** form of this command.

standby delay minimum *min-seconds* [**reload** *reload-seconds*]
no standby delay

Syntax Description

minimum *min-seconds*	Specifies the minimum time (in seconds) to delay HSRP group initialization after an interface comes up. This minimum delay period applies to all subsequent interface events.
	The valid range is 0 to 300 seconds. The default is 1 second. A commonly used value is 30 seconds.
reload *reload-seconds*	(Optional) Time (in seconds) to delay after the device has reloaded. This delay period applies only to the first interface-up event after the device has reloaded, if such an event occurs within 240 seconds from reload. The timer starts at the interface-up event.
	The valid range is 0 to 10000 seconds. The default is 5 seconds. A commonly used value is 60 seconds. The preemption delay is specified in seconds, and only after a reload.

Command Default

HSRP group initialization is not delayed.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2	This command was introduced.
12.2(14)SX	Support for this command was added for the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.4(20)T	This command was integrated into Cisco IOS Release 12.4(20)T. The time range for the device reload delay period was changed from 0 to 300 seconds to 0 to 10000 seconds.

Usage Guidelines

If the active device fails or is removed from the network, then the standby device will automatically become the new active device. If the former active device comes back online, you can control whether it takes over as the active device by using the **standby preempt** command.

However, in some cases, even if the **standby preempt** command is not configured, the former active device will resume the active role after it reloads and comes back online. Use the **standby delay minimum reload**

command to set a delay period for HSRP group initialization. This command allows time for the packets to get through before the device resumes the active role.

We recommend that all HSRP devices have the **standby delay minimum reload** configured with a minimum delay time of 30 seconds and a minimum reload time of 60 seconds.

The delay will be cancelled if an HSRP packet is received on an interface.

The **standby delay minimum reload** interface configuration command delays HSRP groups from initializing for the specified time after the interface comes up.

This command is separate from the **standby preempt delay** interface configuration command, which enables HSRP preemption delay.

Examples

The following example sets the minimum delay period to 30 seconds and the delay period after the first reload to 60 seconds:

```
Device(config)# interface ethernet 0
Device(config-if)# ip address 10.20.0.7 255.255.0.0
Device(config-if)# standby delay minimum 30 reload 60
Device(config-if)# standby 3 ip 10.20.0.21
Device(config-if)# standby 3 timers msec 300 msec 700
Device(config-if)# standby 3 priority 100
```

Related Commands

Command	Description
show standby delay	Displays HSRP information about delay periods.
standby preempt	Configures the HSRP preemption and preemption delay.
standby timers	Configures the time between hello packets and the time before other devices declare the active HSRP or standby device to be down.

standby follow

To configure a Hot Standby Router Protocol (HSRP) group to become an IP redundancy client of another HSRP group, use the**standby follow** command in interface configuration mode. To remove the configuration of an HSRP group as a client group, use the **no** form of this command.

standby *group-number* **follow** *group-name*
no **standby** *group-number* **follow** *group-name*

Syntax Description

group-number	Group number on the interface for which HSRP is being activated. The default is 0.
group-name	Specifies the name of the master group for the client group to follow.

Command Default

HSRP groups are not configured as client groups.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The **standby follow** command configures an HSRP group to become an IP redundancy client of another HSRP group.

Client or slave groups must be on the same physical interface as the master group.

A client group takes its state from the master group it is following. Therefore, the client group does not use its timer, priority, or preemption settings. A warning is displayed if these settings are configured on a client group:

```
Router(config-if)# standby 1 priority 110
%Warning: This setting has no effect while following another group.
Router(config-if)# standby 1 timers 5 15
% Warning: This setting has no effect while following another group.
Router(config-if)# standby 1 preempt delay minimum 300
% Warning: This setting has no effect while following another group.
```

HSRP client groups follow the master HSRP with a slight, random delay so that all client groups do not change at the same time.

You cannot configure an HSRP group to follow another HSRP group if that group is itself being followed by another HSRP group.

Use the**show standby** command to display complete information about an HSRP client group.

Examples   The following example shows how to configure HSRP group 2 as a client to the HSRP1 master group:

```
Router(config-if)# standby 2 follow HSRP1
```

Related Commands

Command	Description
show standby	Displays HSRP information.

standby ip

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

standby [*group-number*] **ip** [*ip-address* [**secondary**]]
no standby [*group-number*] **ip** [*ip-address*]

Syntax Description

group-number	(Optional) Group number on the interface for which HSRP is being activated. The default is 0. The group number range is from 0 to 255 for HSRP version 1 and from 0 to 4095 for HSRP version 2.
ip-address	(Optional) IP address of the Hot Standby router interface.
secondary	(Optional) Indicates 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
The default group number is 0. HSRP is disabled by default.

Command Modes
Interface configuration (config-if)

Command History

Release	Modification
10.0	This command was introduced.
10.3	The *group-number* argument was added.
11.1	The **secondary** keyword was added.
12.3(4)T	The group number range was expanded for HSRP version 2.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines
The **standby ip** 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 designated address is learned through the standby function. For HSRP to elect a designated router, at least one router on the cable must have been configured with, or have learned, the designated address. Configuration of the designated address on the active router always overrides a designated address that is currently in use.

When the **standby ip** 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 of the interface is active, proxy ARP requests are answered using the MAC address of the Hot Standby group. If the interface is in a different state, proxy ARP responses are suppressed.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

HSRP version 2 permits an expanded group number range from 0 to 4095. The increased group number range does not imply that an interface can, or should, support that many HSRP groups. The expanded group number range was changed to allow the group number to match the VLAN number on subinterfaces.

Examples

The following example activates HSRP for group 1 on Ethernet interface 0. The IP address used by the Hot Standby group will be learned using HSRP.

```
Router(config)# interface ethernet 0
Router(config-if)# standby 1 ip
```

In the following example, all three virtual IP addresses appear in the ARP table using the same (single) virtual MAC address. All three virtual IP addresses are using the same HSRP group (group 0).

```
Router(config-if)# ip address 10.1.1.1. 255.255.255.0
Router(config-if)# ip address 10.2.2.2. 255.255.255.0 secondary
Router(config-if)# ip address 10.3.3.3. 255.255.255.0 secondary
Router(config-if)# ip address 10.4.4.4. 255.255.255.0 secondary
Router(config-if)# standby ip 10.1.1.254
Router(config-if)# standby ip 10.2.2.254 secondary
Router(config-if)# standby ip 10.3.3.254 secondary
```

standby ipv6

To ac tivate the Hot Standby Router Protocol (HSRP) in IPv6, use the **standby ipv6** command in interface configuration mode. To disable HSRP, use the **no**form of this command.

standby [*group-number*] **ipv6** {*ipv6-global-address* | *ipv6-address* */prefix-length* | *ipv6-prefix* */prefix-lengthlink-local-address* | **autoconfig**}
no standby [*group-number*] **ipv6** {*ipv6-global-address* | *ipv6-address* */prefix-length* | *ipv6-prefix* */prefix-lengthlink-local-address* | **autoconfig**}

Syntax Description

group-number	(Optional) Group number on the interface for which HSRP is being activated. The default is 0. The group number range is from 0 to 255 for HSRP version 1 and from 0 to 4095 for HSRP version 2.
ipv6-global-address	IPv6 address of the hot standby router interface.
ipv6-prefix	The IPv6 network assigned to the interface. This argument must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons.
/ prefix-length	The length of the IPv6 prefix. A decimal value that indicates how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address). A slash mark must precede the decimal value.
link-local-address	Link-local address of the hot standby router interface.
autoconfig	Indicates that a virtual link-local address will be generated automatically from the link-local prefix and a modified EUI-64 format interface identifier, where the EUI-64 interface identifier is created from the relevant HSRP virtual MAC address.

Command Default The default group number is 0. HSRP is disabled by default.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(4)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SXI4	Users can configure a fully routable global virtual IPv6 address.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.
15.3(1)S	This command was integrated into Cisco IOS Release 15.3(1)S.

Usage Guidelines An Ethernet or FDDI type interface must be used for HSRP for IPv6. HSRP version 2 must be enabled on an interface before HSRP IPv6 can be configured.

The **standby ipv6** command enables an HSRP group for IPv6 operation. If the **autoconfig** keyword is used, then a link-local address will be generated from the link-local prefix and a modified EUI-64 format interface identifier, where the EUI-64 interface identifier is created from the relevant HSRP virtual MAC address.

If an IPv6 global address is used, it must include an IPv6 prefix length. If a link-local address is used, it does not have a prefix.

Examples The following example enables an HSRP group for IPv6 operation:

```
Router(config)# standby version 2
Router(config)# interface ethernet 0
Router(config-if)# standby ipv6 autoconfig
```

The following example shows three HSRP global IPv6 addresses with an explicitly configured link-local address:

```
interface Ethernet0/0
 no ip address
 ipv6 address 2001::0DB8:1/64
 standby version 2
 standby 1 ipv6 FE80::1:CAFÉ
 standby 1 ipv6 2001::0DB8:2/64
 standby 1 ipv6 2001:0DB8::3/64
 standby 1 ipv6 2001:0DB8::4/64
```

Related Commands

Command	Description
show ipv6 interface	Displays the usability status of interfaces configured for IPv6.

standby mac-address

To specify a virtual Media Access Control (MAC) address for the Hot Standby Router Protocol (HSRP), use the **standby mac-address** command in interface configuration mode. To revert to the standard virtual MAC address (000.0C07.AC*xy*), use the **no** form of this command.

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

Syntax Description

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

Command Default

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

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command cannot be used on a Token Ring interface.

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 (APN), use the MAC address to identify the first hop for outing purposes. In this case, it is often necessary to be able to specify the virtual MAC address; the virtual IP address is unimportant for these protocols. Use the **standby 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. The parallel terms are shown in the table below.

Table 1: Parallel Terms Between APPN and IP

APPN	IP
End node	Host
Network Node	Router or gateway

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

Examples

If the end nodes are configured to use 4000.1000.1060 as the MAC address of the network node, the following example shows the command used to configure HSRP group 1 with the virtual MAC address:

```
Router(config-if)# standby 1 mac-address 4000.1000.1060
```

Related Commands

Command	Description
show standby	Displays HSRP information.
standby use-bia	Configures HSRP to use the burned-in address of the interface as its virtual MAC address.

standby mac-refresh

To change the interval at which packets are sent to refresh the Media Access Control (MAC) cache when the Hot Standby Router Protocol (HSRP) is running over FDDI, use the **standby mac-refresh** command in interface configuration mode. To restore the default value, use the **no** form of this command.

standby mac-refresh *seconds*
no standby mac-refresh

Syntax Description

seconds	Number of seconds in the interval at which a packet is sent to refresh the MAC cache. The maximum value is 255 seconds. The default is 10 seconds.

Command Default

The standby MAC refresh interval is 10 seconds.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command applies to HSRP running over FDDI only. Packets are sent every 10 seconds to refresh the MAC cache on learning bridges or switches. By default, the MAC cache entries age out in 300 seconds (5 minutes).

All other routers participating in HSRP on the FDDI ring receive the refresh packets, although the packets are intended only for the learning bridge or switch. Use this command to change the interval. Set the interval to 0 if you want to prevent refresh packets (if you have FDDI but do not have a learning bridge or switch).

Examples

The following example changes the MAC refresh interval to 100 seconds. Therefore, a learning bridge would need to miss three packets before the entry ages out.

```
Router(config-if)# standby mac-refresh 100
```

standby name

To specify the name of the HSRP standby group, use the **standby name** command in interface configuration mode. To remove the name, use the **no** form of this command.

standby name *group-name*
no standby name *group-name*

Syntax Description

group-name	Specifies the name of the standby group.

Command Default

The Hot Standby Router Protocol (HSRP) is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(2)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command specifies the HSRP group used. The HSRP group name must be unique on the router. HSRP group names must not exceed 25 characters in length in releases after Cisco IOS Release 12.2SR. If the name is longer than 25 characters, it must be truncated by the user.

Examples

The following example shows how to specify the standby name as SanJoseHA:

```
Router(config)# interface ethernet0
Router(config-if)# ip address 10.0.0.1 255.0.0.0
Router(config-if)# standby ip 10.0.0.10
Router(config-if)# standby name SanJoseHA
Router(config-if)# standby preempt delay sync 100
Router(config-if)# standby priority 110
```

Related Commands

Command	Description
ip mobile home-agent redundancy	Configures the home agent for redundancy.

standby preempt

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

standby [*group-number*] **preempt** [**delay**{ [**minimum** *seconds*] [**reload** *seconds*] [**sync** *seconds*] }]

no standby [*group-number*] **preempt** [**delay**]

Syntax Description

group-number	(Optional) Group number on the interface to which the other arguments in this command apply.
delay	(Optional) Required if either the **minimum**, **reload**, or **sync** keywords are specified.
minimum *seconds*	(Optional) Specifies the minimum delay period in seconds. The *seconds* argument causes the local device to postpone taking over the active role for a minimum number of seconds since that device was last restarted. The range is from 0 to 3600 seconds (1 hour). The default is 0 seconds (no delay).
reload *seconds*	(Optional) Specifies the preemption delay, in seconds, after a reload only. This delay period applies only to the first interface-up event after the device has reloaded, if such an event occurs within 360 seconds from reload. The timer starts at the interface-up event.
sync *seconds*	(Optional) Specifies the maximum synchronization period for IP redundancy clients in seconds.

Command Default

The default group number is 0. The default delay is 0 seconds; if the device wants to preempt, it will do so immediately. By default, the device that comes up later becomes the standby.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.3	This command was introduced.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.0(2)T	The **minimum** and **sync** keywords were added.
12.2	The behavior of the command changed such that **standby preempt** and **standby priority** must be entered as separate commands.
12.2	The **reload** keyword was added.
12.4(4)T	Support for IPv6 was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Release	Modification
12.2(33)SXH	The behavior of the command changed such that **standby preempt** and **standby priority** must be entered as separate commands.
15.3(1)S	This command was integrated into Cisco IOS Release 15.3(1)S.

Usage Guidelines

Note   Cisco IOS 12.2SX software releases earlier than Cisco IOS Release 12.2(33)SXH use the syntax from Cisco IOS Release 12.1, which supports **preempt** as a keyword for the **standby priority** command. Cisco IOS Release 12.2(33)SXH and later releases use Cisco IOS Release 12.2 syntax, which requires **standby preempt** and **standby priority** to be entered as separate commands.

When the **standby preempt** command is configured, the device is configured to preempt, which means that when the local device has a Hot Standby priority higher than the current active device, the local device should attempt to assume control as the active device. If preemption is not configured, the local device assumes control as the active device only if it receives information indicating no device is in the active state (acting as the designated device).

This command is separate from the **standby delay minimum reload** interface configuration command, which delays HSRP groups from initializing for the specified time after the interface comes up.

When a device first comes up, it does not have a complete routing table. If it is configured to preempt, it will become the active device, yet it is unable to provide adequate routing services. Solve this problem by configuring a delay before the preempting device actually preempts the currently active device.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

IP redundancy clients can prevent preemption from taking place. The **standby preempt delay sync** *seconds* command specifies a maximum number of seconds to allow IP redundancy clients to prevent preemption. When this expires, then preemption takes place regardless of the state of the IP redundancy clients.

The **standby preempt delay reload** *seconds* command allows preemption to occur only after a device reloads. This provides stabilization of the device at startup. After this initial delay at startup, the operation returns to the default behavior.

The **no standby preempt delay** command will disable the preemption delay but preemption will remain enabled. The **no standby preempt delay minimum** *seconds* command will disable the minimum delay but leave any synchronization delay if it was configured.

When the **standby follow** command is used to configure an HSRP group to become an IP redundancy client of another HSRP group, the client group takes its state from the master group it is following. Therefore, the client group does not use its timer, priority, or preemption settings. A warning is displayed if these settings are configured on a client group:

```
Device(config-if)# standby 1 preempt delay minimum 300
    % Warning: This setting has no effect while following another group.
```

Examples

In the following example, the device will wait for 300 seconds (5 minutes) before attempting to become the active device:

```
Device(config)# interface ethernet 0
Device(config-if)# standby ip 172.19.108.254
Device(config-if)# standby preempt delay minimum 300
```

standby priority

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

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

Syntax Description

group-number	(Optional) Group number on the interface to which the other arguments in this command apply. The default group number is 0.
priority	Priority value that prioritizes a potential Hot Standby router. The range is from 1 to 255, where 1 denotes the lowest priority and 255 denotes the highest priority. The default priority value is 100. The router in the HSRP group with the highest priority value becomes the active router.

Command Default

The default group number is 0. The default priority is 100.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.3	This command was introduced.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2	The behavior of the command changed such that **standby preempt** and **standby priority** must be entered as separate commands.
12.4(4)T	Support for IPv6 was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SXH	The behavior of the command changed such that **standby preempt** and **standby priority** must be entered as separate commands.
15.3(1)S	This command was integrated into Cisco IOS Release 15.3(1)S

Usage Guidelines

Note   Cisco IOS 12.2SX software releases earlier than Cisco IOS Release 12.2(33)SXH use the syntax from Cisco IOS Release 12.1, which supports **preempt** as a keyword for the **standby priority** command. Cisco IOS Release 12.2(33)SXH and later releases use Cisco IOS Release 12.2 syntax, which requires **standby preempt** and**standby priority** to be entered as separate commands.

When group number 0 is used, the number 0 is written to NVRAM, providing backward compatibility.

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 primary IP addresses are compared, and the higher IP address has priority.

Note that the priority of the device can change dynamically if an interface is configured with the **standby track** command and another interface on the router or a tracked object goes down.

When the **standby follow** command is used to configure an HSRP group to become an IP redundancy client of another HSRP group, the client group takes its state from the master group it is following. Therefore, the client group does not use its timer, priority, or preemption settings. A warning is displayed if these settings are configured on a client group:

```
Router(config-if)# standby 1 priority 110

%Warning: This setting has no effect while following another group.
```

Examples

In the following example, the router has a priority of 120 (higher than the default value):

```
Router(config)# interface ethernet 0
Router(config-if)# standby ip 172.19.108.254
Router(config-if)# standby priority 120
Router(config-if)# standby preempt delay 300
```

Related Commands

Command	Description
standby track	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.

standby redirect

To enable Hot Standby Router Protocol (HSRP) filtering of Internet Control Message Protocol (ICMP) redirect messages, use the **standby redirect** command in interface configuration mode. To disable the HSRP filtering of ICMP redirect messages, use the **no** form of this command.

standby redirect [**timers** *advertisement holddown*] [**unknown**]
no standby redirect [**unknown**]

Syntax Description	**timers**	(Optional) Adjusts HSRP router advertisement timers.
	advertisement	(Optional) HSRP Router advertisement interval in seconds. This is an integer from 10 to 180. The default is 60 seconds.
	holddown	(Optional) HSRP router holddown interval in seconds. This is an integer from 61 to 3600. The default is 180 seconds.
	unknown	(Optional) Allows sending of ICMP packets when the next hop IP address contained in the packet is unknown in the HSRP table of real IP addresses and active virtual IP addresses. The **no standby redirect unknown** command stops the redirects from being sent.

Command Default HSRP filtering of ICMP redirect messages is enabled if HSRP is configured on an interface.

Command Modes Interface configuration (config-if)

Command History

Release	Modification
12.1(3)T	This command was introduced.
12.2	The following keywords and arguments were added to the command: • **timers** *advertisement holdtime* • **unknown**
12.3(2)T	The **enable** and **disable** keywords were deprecated.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines The **standby redirect** command can be configured globally or on a per-interface basis. When HSRP is first configured on an interface, the setting for that interface will inherit the global value. If the filtering of ICMP redirects is explicitly disabled on an interface, then the global command cannot reenable this functionality.

With the **standby redirect** command enabled, the real IP address of a router can be replaced with a virtual IP address in the next hop address or gateway field of the redirect packet. HSRP looks up the next hop IP address in its table of real IP addresses versus virtual IP addresses. If HSRP does not find a match, the HSRP router allows the redirect packet to go out unchanged. The host HSRP router is redirected to a router that is unknown, that is, a router with no active HSRP groups. You can specify the **no standby redirect unknown** command to stop these redirects from being sent.

Examples

The following example shows how to allow HSRP to filter ICMP redirect messages on interface Ethernet 0:

```
Router(config)# interface ethernet 0
Router(config-if)# ip address 10.0.0.1 255.0.0.0
Router(config-if)# standby redirect
Router(config-if)# standby 1 ip 10.0.0.11
```

The following example shows how to change the HSRP router advertisement interval to 90 seconds and the holddown timer to 270 seconds on interface Ethernet 0:

```
Router(config)# interface ethernet 0
Router(config-if)# ip address 10.0.0.1 255.0.0.0
Router(config-if)# standby redirect timers 90 270
Router(config-if)# standby 1 ip 10.0.0.11
```

Related Commands

Command	Description
show standby	Displays the HSRP information.
show standby redirect	Displays ICMP redirect information on interfaces configured with the HSRP.

standby redirects (global)

To configure Internet Control Message Protocol (ICMP) redirect messages with a Hot Standby Router Protocol (HSRP) virtual IP address as the gateway IP address, use the **standby redirects** command in global configuration mode. To disable the configuration, use the **no** form of this command.

standby redirects [{**disable** | **enable**}]
no standby redirects

Syntax Description

disable	(Optional) Disables the gateway address configuration.
enable	(Optional) Enables the gateway address configuration.

Command Default   The HSRP virtual IP address is configured as the gateway IP address.

Command Modes   Global configuration (config)

Command History

Release	Modification
15.0(1)M	This command was introduced in a release earlier than Cisco IOS Release 15.0(1)M.
12.2(33)SRC	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SRC.
12.2(33)SXI	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SXI.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1 and implemented on the Cisco ASR 1000 Series Aggregation Services Routers.

Examples   The following example shows how to disable the gateway address configuration:

```
Router# configure terminal
Router(config)# standby redirects disable
```

Related Commands

Command	Description
show standby redirect	Displays ICMP redirect information on interfaces configured with the HSRP.

standby send arp

To configure Hot Standby Router Protocol (HSRP) to send a single gratuitous ARP packet for each active HSRP group, use the **standby send arp** command in user EXEC or privileged EXEC mode.

standby send arp [*interface-type interface-number* [*group-number*]]

Syntax Description

interface-type interface-number	(Optional) Interface type and number of the interface out of which ARP packets are sent.
group-number	(Optional) Group number on the interface to which the other arguments in this command apply.

Command Default

HSRP sends gratuitous ARP packets from an HSRP group when it changes to the Active state.

Command Modes

User EXEC Privileged EXEC(#)

Command History

Release	Modification
12.2(33)SXI	This command was introduced.

Usage Guidelines

Use the **standby send arp** command to cause a single gratuitous ARP packet to be sent for each active group. HSRP checks that the virtual IP address is entered correctly in the ARP cache prior to sending a gratuitous ARP packet. If the ARP entry is incorrect then HSRP will try to re-add it. This enables you to ensure that a host ARP cache is updated prior to starting heavy CPU-usage processes or configurations.

Static or alias ARP entries cannot be overwritten by HSRP.

You can use the **standby arp gratuitous** command in interface configuration mode to configure the number of gratuitous ARP packets sent by an active HSRP group, and how often they are sent.

Examples

The following example shows how to configure HSRP to check that an ARP cache is refreshed prior to sending a gratuitous ARP packet:

```
Router# standby send arp ethernet0/0 1
```

Related Commands

Command	Description
debug standby events	Displays events related to HSRP.
show standby arp gratuitous	Displays the number of gratuitous ARP packets sent by HSRP and how often they are sent.
standby arp gratuitous	Configures the number of gratuitous ARP packets sent by an active HSRP group, and how often they are sent.

standby sso

To enable Hot Standby Router Protocol (HSRP) Stateful Switchover (SSO), use the **standby sso** command in global configuration mode. To disable HSRP SSO, use the **no** form of this command.

standby sso
no standby sso

Syntax Description	This command has no arguments or keywords.
Command Default	HSRP SSO is enabled when redundancy mode SSO is configured.
Command Modes	Global configuration (config)

Command History

Release	Modification
12.2(25)S	This command was introduced.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

Use the **standby sso** command to enable HSRP SSO. This is the default when redundancy mode SSO is configured. When standby SSO is enabled, traffic sent using an HSRP virtual IP address continues through the HSRP group member using the current path while a Route Processor (RP) switchover occurs. The HSRP state is maintained and kept synchronized across the redundant RPs within the chassis.

If you want the traffic to switch to a redundant device (another chassis) even though the redundant RP is capable of taking over, then the feature can be disabled by using the **no** form of the command. If the command is disabled and if the primary HSRP router fails, the HSRP state is not maintained across RP switchover and traffic targeted to the HSRP virtual IP address is handled by the standby HSRP router.

Examples

The following example shows how to reenable standby SSO for HSRP if it has been disabled:

```
Router(config)# standby sso
```

Related Commands

Command	Description
debug standby events	Displays standby events related to HSRP.
show standby	Displays HSRP information.

standby 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 **standby timers** command in interface configuration mode. To restore the timers to their default values, use the **no** form of this command.

standby [*group-number*] **timers** [**msec**] *hellotime* [**msec**] *holdtime*
no standby [*group-number*] **timers** [**msec**] *hellotime* [**msec**] *holdtime*

Syntax Description

group-number	(Optional) Group number on the interface to which the timers apply. The default is 0.
msec	(Optional) Interval in milliseconds. Millisecond timers allow for faster failover.
hellotime	Hello interval (in seconds). This is an integer from 1 to 254. The default is 3 seconds. If the **msec** option is specified, hello interval is in milliseconds. This is an integer from 15 to 999.

holdtime	Time (in seconds) before the active or standby router is declared to be down. This is an integer from x to 255. The default is 10 seconds. If the **msec** option is specified, *holdtime* is in milliseconds. This is an integer from y to 3000.
	
	Where:
	
	  • x is the *hellotime* + 50 milliseconds, then rounded up to the nearest 1 second
	
	  • y is greater than or equal to 3 times the *hellotime* and is not less than 50 milliseconds.

Command Default

The default group number is 0. The default hello interval is 3 seconds. The default hold time is 10 seconds.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
10.0	This command was introduced.
11.2	The **msec** keyword was added.
12.2	The minimum values of *hellotime* and *holdtime* in milliseconds changed.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **standby timers** command configures the time between standby hello packets and the time before other routers declare the active or standby router to be down. Routers or access servers on which timer values are not configured can learn timer values from the active or standby router. 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, holdtime is greater than or equal to 3 times the value of hellotime. The range of values for

holdtime force the holdtime to be greater than the hellotime. If the timer values are specified in milliseconds, the holdtime is required to be at least three times the hellotime value and not less than 50 milliseconds.

Some HSRP state flapping can occasionally occur if the holdtime is set to less than 250 milliseconds, and the processor is busy. It is recommended that holdtime values less than 250 milliseconds be used on Cisco 7200 platforms or better, and on Fast-Ethernet or FDDI interfaces or better. Setting the **process-max-time** command to a suitable value may also help with flapping.

The value of the standby timer will not be learned through HSRP hellos if it is less than 1 second.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

When the **standby follow** command is used to configure an HSRP group to become an IP redundancy client of another HSRP group, the client group takes its state from the master group it is following. Therefore, the client group does not use its timer, priority, or preemption settings. A warning is displayed if these settings are configured on a client group:

```
Router(config-if)# standby 1 timers 5 15
    % Warning: This setting has no effect while following another group.
```

Examples

The following example sets, for group number 1 on Ethernet interface 0, the time between hello packets to 5 seconds, and the time after which a router is considered to be down to 15 seconds:

```
Router(config)# interface ethernet 0
Router(config-if)# standby 1 ip
Router(config-if)# standby 1 timers 5 15
```

The following example sets, for the Hot Router interface located at 172.19.10.1 on Ethernet interface 0, the time between hello packets to 300 milliseconds, and the time after which a router is considered to be down to 900 milliseconds:

```
Router(config)# interface ethernet 0
Router(config-if)# standby ip 172.19.10.1
Router(config-if)# standby timers msec 300 msec 900
```

The following example sets, for the Hot Router interface located at 172.18.10.1 on Ethernet interface 0, the time between hello packets to 15 milliseconds, and the time after which a router is considered to be down to 50 milliseconds. Note that the holdtime is larger than three times the hellotime because the minimum holdtime value in milliseconds is 50.

```
Router(config)# interface ethernet 0
Router(config-if)# standby ip 172.18.10.1
Router(config-if)# standby timers msec 15 msec 50
```

standby track

To configure the Hot Standby Router Protocol (HSRP) to track an object and change the Hot Standby priority on the basis of the state of the object, use the **standby track** command in interface configuration mode. To remove the tracking, use the **no** form of this command.

Cisco IOS XE Release 2.1 and Later Releases

standby track {*object-number* | *interface-type interface-number* [**decrement** *priority-decrement*]} [**shutdown**]

no standby track {*object-number* | *interface-type interface-number*}

Cisco IOS Release 12.2(33)SXH, 12.2(33)SRB, and Later Releases

standby track {*object-number* | *interface-type interface-number* [**decrement** *priority-decrement*]} [**shutdown**]

no standby track {*object-number* | *interface-type interface-number*}

Cisco IOS Release 12.4(9)T and Later Releases

standby track {*object-number* [*priority-decrement*] | *interface-type interface-number* [**decrement** *priority-decrement*]} [**shutdown**]

no standby track {*object-number* | *interface-type interface-number*}

Cisco IOS Release 12.2(15)T and Later Releases

standby track {*object-number* [*priority-decrement*] | *interface-type interface-number* [**decrement** *priority-decrement*]}

no standby track {*object-number* | *interface-type interface-number*}

Cisco IOS Releases 12.2(13)T, 12.2(14)SX, 12.2(17dSXB), 12.2(33)SRA, and Earlier Releases

standby track *interface-type interface-number* [*interface-priority*]

no standby track *interface-type interface-number* [*interface-priority*]

Syntax Description

object-number	Object number that represents the object to be tracked. The range is from 1 to 1000. The default is 1.
interface-type	Interface type (combined with interface number) that will be tracked.
interface-number	Interface number (combined with interface type) that will be tracked.
decrement *priority-decrement*	(Optional) Amount by which the Hot Standby priority for the router is decremented (or incremented) when the tracked object goes down (or comes back up). The range is from 1 to 255. The default is 10.
shutdown	(Optional) Changes the HSRP group to the Init state on the basis of the state of a tracked object.
interface-priority	(Optional) Amount by which the Hot Standby priority for the router is decremented (or incremented) when the interface goes down (or comes back up). The range is from 0 to 255. The default is 10.
group-number	(Optional) Group number to which the tracking applies.

Command Default   There is no tracking.

Command Modes   Interface configuration (config-if)

Command History

Release	Modification
10.3	This command was introduced.
12.2(15)T	This command was enhanced to allow HSRP to track objects other than the interface line-protocol state.
12.2(14)SX	Support for this command was introduced on the Cisco 7600 series routers running a Supervisor Engine 720 .
12.2(17d)SXB	This command was integrated into Cisco IOS release 12.2(17d)SXB.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(9)T	The **shutdown** keyword was added.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.1(3)T	This command was modified. The valid range of the *object-number* argument increased to 1000.
15.1(1)S	This command was modified. The valid range for the *object-number* argument increased to 1000.
12.2(50)SY	This command was modified. The valid range for the *object-number* argument increased to 1000.

Usage Guidelines   This command ties the Hot Standby priority of the router to the availability of its tracked objects. Use the **track interface** command or **track ip route** command to track an interface object or an IP-route object. The HSRP client can register its interest in the tracking process by using the **standby track** command and take action when the object changes.

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

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

When multiple tracked objects are down, the decrements are cumulative, whether configured with *priority-decrement* or *interface-priority* values or not.

The optional **shutdown** keyword configures the HSRP group to change to the Init state and become disabled rather than having its priority decremented when a tracked object goes down.

Use the **no standby** *group-number* **track** command to delete all tracking configuration for a group.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

The **standby track** command syntax prior to Cisco IOS Release 12.2(15)T is still supported. Using the older form of the command syntax will cause a tracked object to be created in the new tracking process. This tracking information can be displayed using the **show track** command.

> **Note** Using the command syntax of **standby track** prior to Cisco IOS Release 12.2(15)T results in the same performance as using the new **standby track** command syntax.

If you configure HSRP to track an interface, and that interface is physically removed as in the case of an Online Insertion and Removal (OIR) operation, then HSRP regards the interface as always down. You cannot remove the HSRP interface-tracking configuration. To prevent this situation, use the **no standby track** command before you physically remove the interface.

If an object is already being tracked by an HSRP group, you cannot change the configuration to use the HSRP Group Shutdown feature that disables the HSRP group. You must first remove the tracking configuration using the **no standby track** command and then reconfigure it using the **standby track** command with the **shutdown** keyword.

As of Cisco IOS Release 15.1(3)T, 15.1(1)S, and 12.2(50)SY, a maximum of 1000 objects can be tracked. Although 1000 tracked objects can be configured, each tracked object uses CPU resources. The amount of available CPU resources on a router is dependent upon variables such as traffic load and how other protocols are configured and run. The ability to use 1000 tracked objects is dependent upon the available CPU. Testing should be conducted on site to ensure that the service works under the specific site traffic conditions.

Examples

In the following example, the tracking process is configured to track the IP-routing capability of serial interface 1/0. HSRP on Ethernet interface 0/0 then registers with the tracking process to be informed of any changes to the IP-routing state of serial interface 1/0. If the IP state on serial interface 1/0 goes down, the priority of the HSRP group is reduced by 10.

If both serial interfaces are operational, Router A will be the HSRP active router because it has the higher priority. However, if IP routing on serial interface 1/0 in Router A fails, the HSRP group priority will be reduced and Router B will take over as the active router, thus maintaining a default virtual gateway service to hosts on the 10.1.0.0 subnet.

Router A Configuration

```
Router(config)# track 100 interface serial1/0 ip routing
Router(config-track)# exit
Router(config)# interface Ethernet0/0
Router(config-if)# ip address 10.1.0.21 255.255.0.0
Router(config-if)# standby 1 ip 10.1.0.1
Router(config-if)# standby 1 preempt
Router(config-if)# standby 1 priority 105
Router(config-if)# standby 1 track 100 decrement 10
```

Router B Configuration

```
Router(config)# track 100 interface serial1/0 ip routing
Router(config-track)# exit
Router(config)# interface Ethernet0/0
Router(config-if)# ip address 10.1.0.22 255.255.0.0
Router(config-if)# standby 1 ip 10.1.0.1
Router(config-if)# standby 1 preempt
Router(config-if)# standby 1 priority 11
Router(config-if)# standby 1 track 100 decrement 10
```

The following example shows how to change the configuration of a tracked object to include the HSRP Group Shutdown feature:

```
Router(config-if)# no standby 1 track 101 decrement 10
Router(config-if)# standby 1 track 101 shutdown
```

Related Commands

Command	Description
show standby	Displays HSRP information.
show track	Displays information about objects that are tracked by the tracking process.
standby preempt	Configures HSRP preemption and preemption delay.
standby priority	Configures Hot Standby priority of potential standby routers.
track interface	Configures an interface to be tracked and enters tracking configuration mode.
track ip route	Tracks the state of an IP route and enters tracking configuration mode.

standby use-bia

To configure 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 (on Ethernet and FDDI) or the functional address (on Token Ring), use the **standby use-bia** command in interface configuration mode. To restore the default virtual MAC address, use the **no** form of this command.

standby use-bia [**scope interface**]
no standby use-bia

Syntax Description		
	scope interface	(Optional) Specifies that this command is configured just for the subinterface on which it was entered, instead of the major interface.

Command Default　HSRP uses the preassigned MAC address on Ethernet and FDDI, or the functional address on Token Ring.

Command Modes　Interface configuration (config-if)

Command History

Release	Modification
11.2	This command was introduced.
12.1	The behavior was modified to allow multiple standby groups to be configured for an interface configured with this command.
12.2(14)SX	Support for this command was added for the Cisco 7600 series routers loaded with a Supervisor Engine 720.
12.2(17d)SXB	Support for this command was extended into Cisco IOS Release 12.2(17d)SXB on the Cisco 7600 series routers loaded with a Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines

Note　This command is not supported on Cisco 7600 series routers that are configured with a Policy Feature Card, version 2 (PFC2). The PFC2 supports a maximum of 16 unique HSRP-group numbers. You can use the same HSRP-group numbers in different VLANs. If you configure more than 16 HSRP groups, this restriction prevents use of the VLAN number as the HSRP-group number.

For an interface with this command configured, multiple standby groups can be configured. Hosts on the interface must have a default gateway configured. We recommend that you set the **no ip proxy-arp** command on the interface. It is desirable to configure the **standby use-bia** command on a Token Ring interface if there are devices that reject ARP replies with source hardware addresses set to a functional address.

When HSRP runs on a multiple-ring, source-routed bridging environment and the HRSP routers reside on different rings, configuring the **standby use-bia** command can prevent confusion about the routing information field.

Without the **scope interface** keywords, the **standby use-bia** command applies to all subinterfaces on the major interface. The **standby use-bia** command may not be configured both with and without the **scope interface** keywords at the same time.

Note   Identically numbered HSRP groups use the same virtual MAC address, which might cause errors if you configure bridge groups.

Examples

In the following example, the burned-in address of Token Ring interface 4/0 will be the virtual MAC address mapped to the virtual IP address:

```
Router(config)# interface token4/0
Router(config-if)# standby use-bia
```

standby version

To change the version of the Hot Standby Router Protocol (HSRP), use the **standby version** command in interface configuration mode. To change to the default version, use the **no** form of this command.

standby version {**1** | **2**}
no standby version

Syntax Description

1	Specifies HSRP version 1.
2	Specifies HSRP version 2.

Command Default

HSRP version 1 is the default HSRP version.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(4)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.4(4)T	Support for IPv6 was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 3.1S	This command was integrated into Cisco IOS XE Release 3.1S.

Usage Guidelines

HSRP version 2 addresses limitations of HSRP version 1 by providing an expanded group number range of 0 to 4095.

HSRP version 2 does not interoperate with HSRP version 1. An interface cannot operate both version 1 and version 2 because both versions are mutually exclusive. However, the different versions can be run on different physical interfaces of the same router. The group number range is from 0 to 255 for HSRP version 1 and from 0 to 4095 for HSRP version 2. You cannot change from version 2 to version 1 if you have configured groups above 255. Use the **no standby version** command to set the HSRP version to the default version, version 1.

If an HSRP version is changed, each group will reinitialize because it now has a new virtual MAC address.

Examples

The following example shows how to configure HSRP version 2 on an interface with a group number of 500:

```
Router(config)# interface vlan500
Router(config-if)# standby version 2
Router(config-if)# standby 500 ip 172.20.100.10
Router(config-if)# standby 500 priority 110
```

```
Router(config-if)# standby 500 preempt
Router(config-if)# standby 500 timers 5 15
```

Related Commands

Command	Description
show standby	Displays HSRP information.

track (VRRP)

To enable an object to be tracked using a Virtual Router Redundancy Protocol version 3 (VRRPv3) group, use the **track** command in VRRP configuration mode. To disable the tracking, use the **no** form of this command.

track *object-number* {**shutdown** | [**decrement** *priority*]}
no track *object-number* {**shutdown** | [**decrement** *priority*]}

Syntax Description	

object-number	Object number representing the interface to be tracked. The range is from 1 to 1000.
shutdown	Shuts down the VRRPv3 group.
decrement *priority*	Sets the priority value by which the VRRP group is reduced if the tracked object state on serial interface VRRPv3 goes down. The valid range is 1 to 255.

Command Default   Tracking an object using aVRRPv3 group is not enabled.

Command Modes   VRRP configuration (config-if-vrrp)

Command History

Release	Modification
15.3(3)M	This command was introduced.

Usage Guidelines   You can configure VRRPv3 to track specific objects, such as an IPv6 object, that can alter the priority level of a virtual device for a VRRPv3 group. The tracked objects are first defined using the **track interface** or **track ipv6 route** commands. The client process, in this case VRRPv3, tracks the objects and can then be notified when the tracked object changes state.

Examples   In the following example, the tracking process is configured to track the state of the IPv6 object using the VRRPv3 group. VRRP on GigabitEthernet interface 0/0/0 then registers with the tracking process to be informed of any changes to the IPv6 object on the VRRPv3 group. If the IPv6 object state on serial interface VRRPv3 goes down, then the priority of the VRRP group is reduced by 20:

```
Device(config)# fhrp version vrrp v3
Device(config)# interface GigabitEthernet 0/0/0
Device(config-if)# vrrp 1 address-family ipv6
Device(config-if-vrrp)# track 1 decrement 20
```

Related Commands

Command	Description
fhrp vrrp version v3	Enables VRRPv3 and VRRS configuration on a device.