Cisco IOS First Hop Redundancy Protocols Command Reference

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CONTENTS

Introduction

Introduction

This document describes the commands used to configure and monitor the following First Hop Redundancy Protocols capabilities and features:

- ICMP Router Discovery Protocol (IRDP)
- Gateway Load Balancing Protocol (GLBP)
- Hot Standby Router Protocol (HSRP)
- Virtual Router Redundancy Protocol (VRRP)
- Virtual Router Redundancy Service (VRRS)

Introduction

A through I

aaa accounting vrrs

To enable authentication, authorization, and accounting (AAA) accounting of requested services for billing or security purposes when you use the Virtual Router Redundancy Service (VRRS), use the **aaa accounting vrrs** command in global configuration mode. To disable AAA accounting for VRRS, use the **no** form of this command.

aaa accounting vrrsdefault| *list-name***start-stop** *method1*[*method2...*]

no aaa accounting vrrsdefault| *list-name***start-stop** *method1*[*method2...*]

Syntax Description

default	Uses the listed accounting methods that follow this keyword as the default list of methods for accounting services.
list-name	Character string used to name the list of accounting methods. If no list name is specified, the system uses the default value.
start-stop	Sends an accounting-on notice. The accounting-on record is sent in the background. The requested user process begins regardless of whether the accounting-on notice is received by the accounting server.
method1 [*method2...*]	(Optional) Character string used to name at least one of the accounting methods, tried in the specified sequence.

Command Default

AAA accounting is disabled for VRRS

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.
15.1(1)S	This command was integrated into Cisco IOS Release 15.1(1)S.

Usage Guidelines

Use the **aaa accounting vrrs** command to define a AAA accounting method list. If you define the AAA default accounting method list, you are defining the AAA accounting method list for all the VRRS servers.

The default AAA accounting method list is applied to all VRRS groups. To specify a group-specific VRRS method list, use the **accounting method** command in VRRS configuration mode.

Examples

The following example shows how to configure VRRP group 1 with the group name “vrrp-name-1” to use VRRS method list vrrs-mlist-1:

```
Router(config)# aaa accounting vrrs vrrp-mlist-1 start-stop group radius
!
Router(config-if)# vrrs vrrp-name-1
Router(config)# accounting mlist vrrs-mlist-1
!
Router(config)# interface gigabitethernet0/2/2
Router(config-if)# ip address 10.0.1.
Router(config-if)# vrrp 1 ip 10.1.0.10
Router(config-if)# vrrp 1 name vrrp-name-1
```

Related Commands

Command	Description
vrrp ip	Enables the VRRP on an interface and identifies the IP address of the virtual router.
vrrp name	Links a VRRS client to a VRRP group.

accounting delay (VRRS)

To specify a delay time for sending accounting-off messages for the Virtual Router Redundancy Service (VRRS), use the **accounting delay** command in VRRS configuration mode. To return to the default accounting delay value, use the **no** form of this command.

accounting delay *seconds*

no accounting delay

Syntax Description

seconds	Time, in seconds, to wait before sending accounting-off messages. Range is from 1 to 30. The default is 0.

Command Default

Accounting-off messages for VRRS are sent without delay.

Command Modes

VRRS configuration (config-vrrs)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.
15.1(1)S	This command was integrated into Cisco IOS Release 15.1(1)S.

Usage Guidelines

Use the **accounting delay** command to control the timing of sending accounting-off messages for VRRS. This command does not apply to accounting-on messages. If the default is specified, this command is not saved to the running configuration and accounting-off messages are sent immediately when the event occurs. Otherwise, a delay of the configured number of seconds is applied.

Examples

The following example shows how to specify a delay time of 10 seconds for sending accounting-off messages for the VRRS:

```
Router(config)# vrrs vrrp-name-1
Router(config-vrrs)# accounting delay 10
```

Related Commands

Command	Description
aaa accounting vrrs	Enables AAA accounting of requested services for billing or security purposes when you use VRRS.

Command	Description
accounting method (VRRS)	Enables VRRS accounting for a VRRP group.
attribute list (VRRS)	Specifies additional attributes to include in VRRS accounting-on and accounting-off messages.
vrrs	Enables VRRS and enters VRRS configuration mode.

accounting method (VRRS)

To enable Virtual Router Redundancy Service (VRRS) accounting for a Virtual Router Redundancy Protocol (VRRP) group, use the **accounting method** command in VRRS configuration mode. To specify the default VRRS accounting method list as the target for VRRS accounting, use the **no** form of this command.

accounting method {**default**| *accounting-method-list*}

no accounting method

Syntax Description

default	Enables VRRS accounting for all VRRP groups.
accounting-method-list	Name of the accounting method list for which VRRS must be enabled.

Command Default

The default VRRS accounting method list is used.

Command Modes

VRRS Configuration (config-vrrs)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.
15.1(1)S	This command was integrated into Cisco IOS Release 15.1(1)S.

Usage Guidelines

Configuring the **default** keyword does not save it to the running configuration and the VRRS accounting type default method list is automatically applied to the VRRS group being configured. The **default** keyword also enables VRRS accounting for all VRRP groups.

The valued specified for the *accounting-method-list* argument must match a named list configured by the **aaa accounting vrrs**command. When there is no match, a warning message is displayed. However, the configuration is still saved.

With this approach, you can configure the desired accounting method list using the **aaa accounting vrrs**command without configuring the **accounting method**command again.

Examples

The following example shows how to configure VRRS to use the accounting list named METHOD1:

```
Router(config)# vrrs VRRS1
Router(config-vrrs)# accounting method METHOD1
```

Related Commands

Command	Description
aaa accounting vrrs	Enables AAA accounting of requested services for billing or security purposes when you use VRRS.
accounting delay (VRRS)	Specifies a delay time for sending accounting-off messages for VRRS.
attribute list (VRRS)	Specifies additional attributes to include in VRRS accounting-on and accounting-off messages.

attribute list (VRRS)

To specify additional attributes to include in Virtual Router Redundancy Service (VRRS) accounting-on and accounting-off messages, use the **attribute list** command in VRRS configuration mode. To configure VRRS to send only default attributes in VRRS accounting messages, use the **no** form of this command.

attribute list *list-name*

no attribute list

Syntax Description

list-name	Specifies a AAA accounting list, as defined by the **aaa attribute list** global configuration command.

Command Default

Default attributes are sent in VRRS accounting messages.

Command Modes

VRRS configuration (config-vrrs)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **attribute list** (VRRS) command to specify additional attributes to be included in both VRRS accounting-on and accounting-off messages. Before configuring this command, define a list name using the **aaa attribute list** global configuration command. If you the enter a list name that is not defined in the **aaa attribute list** global configuration command, a warning message is displayed. However, this command is still accepted.

The following RADIUS attributes are included in VRRS accounting messages by default:

- Attribute 4, NAS-IP-Address
- Attribute 26, Cisco VSA Type 1, vrrs
- Attribute 40, Acct-Status-Type
- Attribute 41, Acct-Delay-Type
- Attribute 44 Acct-Session-Id

Examples

The following example configures VRRS to use the AAA accounting list named vrrp-1-attr:

```
Router(config)# aaa accounting vrrs default start-stop group radius
Router(config)# aaa attribute list vrrp-1-attr
Router(config-attr-list)# attribute type account-delay “10”
```

```
Router(config-attr-list)# exit
Router(config)# vrrs vrrp-name-1
Router(config-vrrs)# accounting delay 10
Router(config-vrrs)# attribute list vrrp-1-attr
```

Related Commands

Command	Description
aaa accounting vrrs	Enables AAA accounting of requested services for billing or security purposes when you use VRRS.
aaa attribute list	Defines a AAA attribute list locally on a router.
accounting delay (VRRS)	Specifies a delay time for sending accounting-off messages for VRRS.
accounting method (VRRS)	Enables VRRS accounting for a VRRP group.

fhrp version vrrp v3

To enable Virtual Router Redundancy Protocol version 3 (VRRPv3) and Virtual Router Redundancy Service (VRRS) configuration on a device, use the **fhrp version vrrp v3** command in global configuration mode. To disable the ability to configure VRRPv3 and VRRS on a device, use the **no** form of this command.

fhrp version vrrp v3

no fhrp version vrrp v3

Syntax Description

This command has no keywords or arguments.

Command Default

VRRPv3 and VRRS configuration on a device is not enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.2(4)M	This command was introduced.
15.3(3)M	This command was integrated into Cisco IOS Release 15.3(3)M.

Usage Guidelines

When VRRPv3 is in use, VRRP version 2 (VRRPv2) is unavailable.

Examples

In the following example, a tracking process is configured to track the state of an IPv6 object using a 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
track (VRRP)	Enables an object to be tracked using a VRRPv3 group.
vrrp name	Links a VRRS client to a VRRP group.

glbp authentication

To configure an authentication string for the Gateway Load Balancing Protocol (GLBP), use the **glbp authentication** command in interface configuration mode. To disable authentication, use the **no** form of this command.

gglbp authentication commandlbp *group-number* **authentication** {**text** *string*| **md5** {**key-string** [**0**| **7**] *key*| **key-chain** *name-of-chain*}}

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

Syntax Description

group-number	GLBP group number in the range from 0 to 1023.
text *string*	Specifies an authentication string. The number of characters in the command plus the text string must not exceed 255 characters.
md5	Message Digest 5 (MD5) authentication.
key-string *key*	Specifies the secret key for MD5 authentication. The key string cannot exceed 100 characters in length. We recommend using at least 16 characters.
0	(Optional) Unencrypted key. If no prefix is specified, the key is unencrypted.
7	(Optional) Encrypted key.
key-chain *name-of-chain*	Identifies a group of authentication keys.

Command Default

No authentication of GLBP messages occurs.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.3(2)T	The **md5** keyword and associated parameters were added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Release	Modification
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The same authentication method must be configured on all the routers that are configured to be members of the same GLBP group, to ensure interoperation. A router will ignore all GLBP messages that contain the wrong authentication information.

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

Examples

The following example configures stringxyz as the authentication string required to allow GLBP routers in group 10 to interoperate:

```
Router(config)# interface fastethernet 0/0
Router(config-if)# glbp 10 authentication text stringxyz
```

In the following example, GLBP queries the key chain "AuthenticateGLBP" to obtain the current live key and key ID for the specified key chain:

```
Router(config)# key chain AuthenticateGLBP
Router(config-keychain)# key 1
Router(config-keychain-key)# key-string ThisIsASecretKey
Router(config-keychain-key)# key-string ThisIsASecretKey
Router(config-keychain-key)# exit
Router(config-keychain)# exit
Router(config)# interface Ethernet0/1
Router(config-if)# ip address 10.0.0.1 255.255.255.0
Router(config-if)# glbp 2 authentication md5 key-chain AuthenticateGLBP
```

Related Commands

Command	Description
glbp ip	Enables GLBP.
service password-encryption	Encrypts passwords.

glbp client-cache maximum

To enable the Gateway Load Balancing Protocol (GLBP) client cache, use the **glbp client-cache** command in interface configuration mode. To disable a GLBP client cache, use the **no** form of this command.

glbp *group* **client-cache maximum** *number* [**timeout** *minutes*]

no glbp *group-number* **client-cache maximum** *number* [**timeout** *minutes*]

Syntax Description

group	GLBP group number in the range from 0 to 1023.
number	Specifies the maximum number of clients the cache will hold for this GLBP group. The range is from 8 to 2000.
timeout *minutes*	(Optional) The maximum amount of time, in minutes, a client entry can stay in the GLBP client cache after the client information was last updated. The range is from 1 to 1440.

Command Default

The GLBP client cache is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.4(15)T	This command was introduced.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.

Usage Guidelines

This command enables a GLBP client cache on a single group only. To enable the client cache on multiple GLBP groups, you must apply this command to each group for which a client cache is required.

You must specify a maximum number of clients that the client cache will hold for a GLBP group to limit the size of the cache. If a GLBP client cache already exists when this command is entered and there are already more clients in the cache than the required number, all of the existing cache entries are discarded.

If you enter the **no** form of this command when there are already client entries in the cache, all of the client entries are discarded before the GLBP client cache is disabled.

Note For IPv4 networks, Cisco recommends setting a GLBP client cache timeout value that is slightly longer than the maximum expected end-host Address Resolution Protocol (ARP) cache timeout value.

Examples

The following example shows how to enable a GLBP client cache with a maximum of 1200 clients:

```
Router(config-if)# glbp 10 client-cache maximum 1200 timeout 245
```

Related Commands

Command	Description
show glbp	Displays GLBP information.

glbp forwarder preempt

To configure a router to take over as active virtual forwarder (AVF) for a Gateway Load Balancing Protocol (GLBP) group if the current AVF falls below its low weighting threshold, use the **glbp forwarder preempt** command in interface configuration mode. To disable this function, use the **no** form of this command.

glbp *group* **forwarder preempt** [**delay minimum** *seconds*]

no glbp *group* **forwarder preempt** [**delay minimum**]

Syntax Description

group	GLBP group number in the range from 0 to 1023.
delay minimum *seconds*	(Optional) Specifies a minimum number of seconds that the router will delay before taking over the role of AVF. The range is from 0 to 3600 seconds with a default delay of 30 seconds.

Command Default

Forwarder preemption is enabled with a default delay of 30 seconds.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Examples

The following example shows a router being configured to preempt the current AVF when the current AVF falls below its low weighting threshold. If the router preempts the current AVF, it waits 60 seconds before taking over the role of the AVF.

```
Router(config-if)# glbp 10 forwarder preempt delay minimum 60
```

Related Commands

Command	Description
glbp ip	Enables GLBP.

glbp ip

To activate the Gateway Load Balancing Protocol (GLBP), use the **glbp ip** command in interface configuration mode. To disable GLBP, use the **no** form of this command.

glbp *group* **ip** [*ip-address* **[secondary]**]

no glbp *group* **ip** [*ip-address* **[secondary]**]

Syntax Description

group	GLBP group number in the range from 0 to 1023.
ip-address	(Optional) Virtual IP address for the GLBP group. The IP address must be in the same subnet as the interface IP address.
secondary	(Optional) Indicates that the IP address is a secondary GLBP virtual address.

Command Default

GLBP is disabled by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The **glbp ip** command activates GLBP on the configured interface. If an IP address is specified, that address is used as the designated virtual IP address for the GLBP group. If no IP address is specified, the designated address is learned from another router configured to be in the same GLBP group. For GLBP to elect an active virtual gateway (AVG), at least one router on the cable must have been configured with the designated address. A router must be configured with, or have learned, the virtual IP address of the GLBP group before assuming

the role of a GLBP gateway or forwarder. Configuring the designated address on the AVG always overrides a designated address that is in use.

When the **glbp ip** command is enabled on an interface, the handling of proxy Address Resolution Protocol (ARP) requests is changed (unless proxy ARP was disabled). ARP requests are sent by hosts to map an IP address to a MAC address. The GLBP gateway intercepts the ARP requests and replies to the ARP on behalf of the connected nodes. If a forwarder in the GLBP group is active, proxy ARP requests are answered using the MAC address of the first active forwarder in the group. If no forwarder is active, proxy ARP responses are suppressed.

Examples

The following example activates GLBP for group 10 on Fast Ethernet interface 0/0. The virtual IP address to be used by the GLBP group is set to 10.21.8.10.

```
Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 10.21.8.32 255.255.255.0
Router(config-if)# glbp 10 ip 10.21.8.10
```

The following example activates GLBP for group 10 on Fast Ethernet interface 0/0. The virtual IP address used by the GLBP group will be learned from another router configured to be in the same GLBP group.

```
Router(config)# interface fastethernet 0/0
Router(config-if)# glbp 10 ip
```

Related Commands

Command	Description
show glbp	Displays GLBP information.

glbp ipv6

To activate the Gateway Load Balancing Protocol (GLBP) in IPv6, use the **glbp ipv6**command in interface configuration mode. To disable GLBP, use the **no**form of this command.

glbp *group* **ipv6** [*ipv6-address*| **autoconfig**]

no glbp *group* **ipv6** [*ipv6-address*| **autoconfig**]

Syntax Description

group	GLBP group number in the range from 0 to 1023.
ip-address	(Optional) Virtual IPv6 address for the GLBP group. The IPv6 address must be in the same subnet as the interface IPv6 address.
autoconfig	(Optional) Indicates a default IPv6 address can be created based on a MAC address.

Command Default

GLBP is disabled by default.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SXI	This command was modified. It was integrated into Cisco IOS Release 12.2(33)SXI.

Usage Guidelines

The **glbp ipv6** command activates GLBP on the configured interface. If an IPv6 address is specified, that address is used as the designated virtual IPv6 address for the GLBP group. If no IPv6 address is specified, the designated address is learned from another router configured to be in the same GLBP group. For GLBP to elect an active virtual gateway (AVG), at least one router on the cable must have been configured with the designated address. A router must be configured with, or have learned, the virtual IPv6 address of the GLBP group before assuming the role of a GLBP gateway or forwarder. Configuring the designated address on the AVG always overrides a designated address that is in use.

When the **glbp ipv6** command is enabled on an interface, the handling of proxy Address Resolution Protocol (ARP) requests is changed (unless proxy ARP was disabled). ARP requests are sent by hosts to map an IPv6 address to a MAC address. The GLBP gateway intercepts the ARP requests and replies to the ARP on behalf of the connected nodes. If a forwarder in the GLBP group is active, proxy ARP requests are answered using

the MAC address of the first active forwarder in the group. If no forwarder is active, proxy ARP responses are suppressed.

Examples

The following example enables GLBP on an IPv6 configured interface:

```
Router(config-if)# glbp ipv6
```

Related Commands

Command	Description
glbp ip	Activates the GLBP in IPv4.
show glbp	Displays GLBP information.

glbp load-balancing

To specify the load-balancing method used by the active virtual gateway (AVG) of the Gateway Load Balancing Protocol (GLBP), use the **glbp load-balancing** command in interface configuration mode. To disable load balancing, use the **no** form of this command.

glbp *group* **load-balancing** [**host-dependent**| **round-robin**| **weighted**]

no glbp *group* **load-balancing**

Syntax Description

group	GLBP group number in the range from 0 to 1023.
host-dependent	(Optional) Specifies a load balancing method based on the MAC address of a host where the same forwarder is always used for a particular host while the number of GLBP group members remains unchanged.
round-robin	(Optional) Specifies a load balancing method where each virtual forwarder in turn is included in address resolution replies for the virtual IP address. This method is the default.
weighted	(Optional) Specifies a load balancing method that is dependent on the weighting value advertised by the gateway.

Command Default

The round-robin method is the default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Release	Modification
12.4(24)T2	This command was modified. When the **no** form of this command is configured, if the AVG does not have an AVF, it preferentially replies to ARP requests with the MAC address of the first listening virtual forwarder.
15.0(1)M1	This command was modified. When the **no** form of this command is configured, if the AVG does not have an Active Virtual Forwarder (AVF), it preferentially replies to ARP requests with the MAC address of the first listening virtual forwarder.
15.1(2)T	This command was modified. When the **no** form of this command is configured, if the AVG does not have an AVF, it preferentially replies to ARP requests with the MAC address of the first listening virtual forwarder.

Usage Guidelines

Use the host-dependent method of GLBP load balancing when you need each host to always use the same router. Use the weighted method of GLBP load balancing when you need unequal load balancing because routers in the GLBP group have different forwarding capacities.

Examples

The following example shows the host-dependent load-balancing method being configured for the AVG of the GLBP group 10:

```
Router(config)# interface fastethernet 0/0
Router(config-if)# glbp 10 ip 10.21.8.10
Router(config-if)# glbp 10 load-balancing host-dependent
```

Related Commands

Command	Description
show glbp	Displays GLBP information.

glbp name

To enable IP redundancy by assigning a name to the Gateway Load Balancing Protocol (GLBP) group, use the **glbp name** command in interface configuration mode. To disable IP redundancy for a group, use the **no** form of this command.

glbp *group-number* **name** *group-name*

no glbp *group-number* **name** *group-name*

Syntax Description

group-number	GLBP group number. Range is from 0 to 1023.
group-name	GLBP group name specified as a character string. Maximum number of characters is 255.

Command Default

IP redundancy for a group is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(7)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.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The GLBP redundancy client must be configured with the same GLBP group name so that the redundancy client and the GLBP group can be connected.

Examples

The following example assigns the abccomp name to GLBP group 10:

```
Router(config-if)# glbp 10 name abccomp
```

Related Commands

Command	Description
glbp authentication	Configures an authentication string for the GLBP.
glbp forwarder preempt	Configures a router to take over as AVF for a GLBP group if it has higher priority than the current AVF.
glbp ip	Activates GLBP.
glbp load-balancing	Specifies the load-balancing method used by the AVG of GLBP.
glbp preempt	Configures the gateway to take over as AVG for a GLBP group if it has higher priority than the current AVG.
glbp priority	Sets the priority level of the gateway within a GLBP group.
glbp timers	Configures the time between hello packets sent by the GLBP gateway and the time for which the virtual gateway and virtual forwarder information is considered valid.
glbp timers redirect	Configures the time during which the AVG for a GLBP group continues to redirect clients to a secondary AVF.
glbp weighting	Specifies the initial weighting value of the GLBP gateway.
glbp weighting track	Specifies a tracking object where the GLBP weighting changes based on the availability of the object being tracked.
show glbp	Displays GLBP information.
track	Configures an interface to be tracked where the GLBP weighting changes based on the state of the interface.

glbp preempt

To configure the gateway to take over as active virtual gateway (AVG) for a Gateway Load Balancing Protocol (GLBP) group if it has higher priority than the current AVG, use the **glbp preempt** command in interface configuration mode. To disable this function, use the **no** form of this command.

glbp *group* **preempt** [**delay minimum** *seconds*]

no glbp *group* **preempt** [**delay minimum**]

Syntax Description

group	GLBP group number in the range from 0 to 1023.
delay minimum *seconds*	(Optional) Specifies a minimum number of seconds that the router will delay before taking over the role of AVG. The range is from 0 to 3600 seconds with a default delay of 30 seconds.

Command Default

A GLBP router with a higher priority than the current AVG cannot assume the role of AVG. The default delay value is 30 seconds.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Examples

The following example shows a router being configured to preempt the current AVG when its priority of 254 is higher than that of the current AVG. If the router preempts the current AVG, it waits 60 seconds before assuming the role of AVG.

```
Router(config-if)# glbp 10 preempt delay minimum 60
Router(config-if)# glbp 10 priority 254
```

Related Commands

Command	Description
glbp ip	Enables GLBP.
glbp priority	Sets the priority level of the router within a GLBP group.

glbp priority

To set the priority level of the gateway within a Gateway Load Balancing Protocol (GLBP) group, use the **glbp priority** command in interface configuration mode. To remove the priority level of the gateway, use the **no** form of this command.

glbp *group* **priority** *level*

no glbp *group* **priority** *level*

Syntax Description

group	GLBP group number in the range from 0 to 1023.
level	Priority of the gateway within the GLBP group. The range is from 1 to 255. The default is 100.

Command Default

The GLBP virtual gateway preemptive scheme is disabled

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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

Use this command to control which virtual gateway becomes the active virtual gateway (AVG). After the priorities of several different virtual gateways are compared, the gateway with the numerically higher priority is elected as the AVG. If two virtual gateways have equal priority, the gateway with the higher IP address is selected.

Examples

The following example shows a virtual gateway being configured with a priority of 254:

```
Router(config-if)# glbp 10 priority 254
```

Related Commands

Command	Description
glbp ip	Enables GLBP.
glbp preempt	Configures a router to take over as the AVG for a GLBP group if it has higher priority than the current AVG.

glbp sso

To enable Gateway Load Balancing Protocol (GLBP) support of Stateful Switchover (SSO) if it has been disabled, use the **glbp sso**command in global configuration mode. To disable GLBP support of SSO, use the **no** form of this command.

glbp sso

no glbp sso

Syntax Description

This command has no arguments or keywords.

Command Default

GLBP Support for SSO is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(31)SB2	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.

Usage Guidelines

Use this command to enable GLBP support of SSO if it has been manually disabled by the **no glbp sso** command.

Examples

The following example show how to disable GLBP support of SSO:

```
Router(config)# no glbp sso
```

Related Commands

Command	Description
debug glbp events	Displays debugging messages about GLBP events.
show glbp	Displays GLBP information.

glbp timers

To configure the time between hello packets sent by the Gateway Load Balancing Protocol (GLBP) gateway and the time that the virtual gateway and virtual forwarder information is considered valid, use the **glbp timers** command in interface configuration mode. To restore the timers to their default values, use the **no** form of this command.

glbp *group* **timers [msec]** *hellotime* **[msec]** *holdtime*

no glbp *group* **timers**

Syntax Description

group	GLBP group number in the range from 0 to 1023.
msec	(Optional) Specifies that the following (*hellotime* or *holdtime)* argument value will be expressed in milliseconds rather than seconds.
hellotime	Hello interval. The default is 3 seconds (3000 milliseconds).
holdtime	Time before the virtual gateway and virtual forwarder information contained in the hello packet is considered invalid. The default is 10 seconds (10,000 milliseconds).

Command Default

GLBP timers are set to their default values.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

Routers on which timer values are not configured can learn timer values from the active virtual gateway (AVG). The timers configured on the AVG always override any other timer settings. All routers in a GLBP group should use the same timer values. If a GLBP gateway sends a hello message, the information should be considered valid for one holdtime. Normally, holdtime is greater than three times the value of hello time, (*holdtime* > 3 * *hellotime*). The range of values for holdtime force the holdtime to be greater than the hello time.

Examples

The following example shows the GLBP group 10 on Fast Ethernet interface 0/0 timers being configured for an interval of 5 seconds between hello packets, and the time after which virtual gateway and virtual forwarder information is considered to be invalid to 18 seconds:

```
Router(config)# interface fastethernet 0/0
Router(config-if)# glbp 10 ip
Router(config-if)# glbp 10 timers 5 18
```

Related Commands

Command	Description
glbp ip	Activates GLBP.
show glbp	Displays GLBP information.

glbp timers redirect

To configure the time during which the active virtual gateway (AVG) for a Gateway Load Balancing Protocol (GLBP) group continues to redirect clients to a secondary active virtual forwarder (AVF), use the **glbp timers redirect** command in interface configuration mode. To restore the redirect timers to their default values, use the **no** form of this command.

glbp *group* **timers redirect** *redirect timeout*

no glbp *group* **timers redirect** *redirect timeout*

Syntax Description

group	GLBP group number in the range from 0 to 1023.
redirect	The redirect timer interval in the range from 0 to 3600 seconds. The default is 600 seconds (10 minutes). **Note** The zero value for the *redirect* argument cannot be removed from the range of acceptable values because preexisting configurations of Cisco IOS software already using the zero value could be negatively affected during an upgrade. However, be advised that a zero setting is not recommended and, if used, results in a redirect timer that never expires. If the redirect timer does not expire, then when a router fails, new hosts continue to be assigned to the failed router instead of being redirected to the backup.
timeout	The time interval, in the range from 600 to 64,800 seconds, before the secondary virtual forwarder becomes unavailable. The default is 14,400 seconds (4 hours).

Command Default

The GLBP redirect timers are set to their default values.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

Release	Modification
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

A virtual forwarder that is assigned a virtual MAC address by the AVG is known as a primary virtual forwarder. If the virtual forwarder has learned the virtual MAC address from hello messages, it is referred to as a secondary virtual forwarder.

The redirect timer sets the time delay between a forwarder failing on the network and the AVG assuming that the forwarder will not return. The virtual MAC address to which the forwarder was responsible for replying is still given out in Address Resolution Protocol (ARP) replies, but the forwarding task is handled by another router in the GLBP group.

Note The zero value for the *redirect* argument cannot be removed from the range of acceptable values because preexisting configurations of Cisco IOS software already using the zero value could be negatively affected during an upgrade. However, be advised that a zero setting is not recommended and, if used, results in a redirect timer that never expires. If the redirect timer does not expire, then when a router fails, new hosts continue to be assigned to the failed router instead of being redirected to the backup.

The timeout interval is the time delay between a forwarder failing on the network and the MAC address for which the forwarder was responsible becoming inactive on all of the routers in the GLBP group. After the timeout interval, packets sent to this virtual MAC address will be lost. The timeout interval must be long enough to allow all hosts to refresh their ARP cache entry that contained the virtual MAC address.

Examples

The following example shows the commands used to configure GLBP group 1 on Fast Ethernet interface 0/0 with a redirect timer of 1800 seconds (30 minutes) and timeout interval of 28,800 seconds (8 hours):

```
Router# config terminal
Router(config)# interface fastEthernet 0/0
Router(config-if)# glbp 1 timers redirect 1800 28800
```

glbp weighting

To specify the initial weighting value of the Gateway Load Balancing Protocol (GLBP) gateway, use the **glbp weighting** command in interface configuration mode. To restore the default values, use the **no**form of this command.

glbp *group* **weighting** *maximum* [**lower** *lower*] [**upper** *upper*]

no glbp *group* **weighting**

Syntax Description

group	GLBP group number in the range from 0 to 1023.
maximum	Maximum weighting value in the range from 1 to 254. Default value is 100.
lower *lower*	(Optional) Specifies a lower weighting value in the range from 1 to the specified maximum weighting value. Default value is 1.
upper *upper*	(Optional) Specifies an upper weighting value in the range from the lower weighting to the maximum weighting value. The default value is the specified maximum weighting value.

Command Default

The default gateway weighting value is 100 and the default lower weighting value is 1.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The weighting value of a virtual gateway is a measure of the forwarding capacity of the gateway. If a tracked interface on the router fails, the weighting value of the router may fall from the maximum value to below the lower threshold, causing the router to give up its role as a virtual forwarder. When the weighting value of the router rises above the upper threshold, the router can resume its active virtual forwarder role.

Use the **glbp weighting track** and **track** commands to configure parameters for an interface to be tracked. If an interface on a router goes down, the weighting for the router can be reduced by a specified value.

Examples

The following example shows the weighting of the gateway for GLBP group 10 being set to a maximum of 110 with a lower weighting limit of 95 and an upper weighting limit of 105:

```
Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 10.21.8.32 255.255.255.0
Router(config-if)# glbp 10 weighting 110 lower 95 upper 105
```

Related Commands

Command	Description
glbp weighting track	Specifies an object to be tracked that affects the weighting of a GLBP gateway.
track	Configures an interface to be tracked.

glbp weighting track

To specify a tracking object where the Gateway Load Balancing Protocol (GLBP) weighting changes based on the availability of the object being tracked, use the **glbp weighting track** command in interface configuration mode. To remove the tracking, use the **no** form of this command.

glbp *group* **weighting track** *object-number* [**decrement** *value*]

no glbp *group* **weighting track** *object-number* [**decrement** *value*]

Syntax Description

group	GLBP group number in the range from 0 to 1023.
object-number	Object number representing an item to be tracked. The valid range is 1 to 1000. Use the **track** command to configure the tracked object.
decrement *value*	(Optional) Specifies an amount by which the GLBP weighting for the router is decremented (or incremented) when the interface goes down (or comes back up). The value range is from 1 to 254, with a default value of 10.

Command Default

Objects are not tracked for GLBP weighting changes.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(14)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
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 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.1(3)T	This command was modified. The valid range for the *object-number* argument increased to 1000.

Release	Modification
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 weighting of the GLBP gateway to the availability of its interfaces. It is useful for tracking interfaces that are not configured for GLBP.

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

The optional *value* argument specifies by how much to decrement the GLBP gateway weighting when a tracked interface goes down. When the tracked interface comes back up, the weighting is incremented by the same amount.

When multiple tracked interfaces are down, the configured weighting decrements are cumulative.

Use the **track** command to configure each interface to be tracked.

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, Fast Ethernet interface 0/0 tracks two interfaces represented by the numbers 1 and 2. If interface 1 goes down, the GLBP gateway weighting decreases by the default value of 10. If interface 2 goes down, the GLBP gateway weighting decreases by 5.

```
Router(config)# interface fastethernet 0/0
Router(config-if)# ip address 10.21.8.32 255.255.255.0
Router(config-if)# glbp 10 weighting track 1
Router(config-if)# glbp 10 weighting track 2 decrement 5
```

Related Commands

Command	Description
glbp weighting	Specifies the initial weighting value of a GLBP gateway.
track	Configures an interface to be tracked.

ip gdp

To configure the router discovery mechanism, use the **ipgdp** command in global configuration mode. To disable the configuration, use the **no** form of this command.

ip gdp {**eigrp**| **irdp [multicast]**| **rip**}

no ip gdp {**eigrp**| **irdp [multicast]**| **rip**}

Syntax Description

eigrp	Configures a gateway to discover routers transmitting Enhanced Interior Gateway Routing Protocol (EIGRP) router updates.
irdp	Configures a gateway to discover routers transmitting ICMP Router Discovery Protocol (IRDP) router updates.
multicast	(Optional) Specifies the router to multicast IRDP solicitations.
rip	Configures a gateway to discover routers transmitting Routing Information Protocol (RIP) router updates.

Command Default

The router discovery mechanism is not configured.

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.

Usage Guidelines

You must disable IP routing to configure the **ipgdp** command.

Examples

The following example shows how to configure the RIP router discovery mechanism:

```
Router# configure terminal
Router(config)# ip gdp rip
```

Related Commands

Command	Description
ip host	Defines static hostname-to-address mappings in the DNS hostname cache for a DNS view.
ip route	Establishes static routes.

ip irdp

To enable ICMP Router Discovery Protocol (IRDP) processing on an interface, use the **ip irdp** command in interface configuration mode. To disable IRDP routing, use the **no** form of this command.

ip irdp [**multicast**| **holdtime** *seconds*| **maxadvertinterval** *seconds*| **minadvertinterval** *seconds*| **preference** *number*| **address** *address* [*number*]]

no ip irdp

Syntax Description

multicast	(Optional) Use the multicast address (224.0.0.1) instead of IP broadcasts.
holdtime *seconds*	(Optional) Length of time in seconds that advertisements are held valid. Default is three times the **maxadvertinterval** value. Must be greater than **maxadvertinterval** and cannot be greater than 9000 seconds.
maxadvertinterval *seconds*	(Optional) Maximum interval in seconds between advertisements. The range is from 1 to 1800. A value of 0 means only advertise when solicited. The default is 600 seconds.
minadvertinterval *seconds*	(Optional) Minimum interval in seconds between advertisements. The range is from 1 to 1800. The default is 450 seconds.
preference *number*	(Optional) Preference value. The allowed range is -2 31 to 2 31 . The default is 0. A higher value increases the preference level of the router. You can modify a particular router so that it will be the preferred router to which other routers will home.
address *address* [*number*]	(Optional) IP address (*address*) to proxy advertise, and optionally, its preference value (*number*).

Command Default

IRDP is disabled by deafult. When enabled, IRDP uses these defaults:

- Broadcast IRDP advertisements
- Maximum interval between advertisements: 600 seconds
- Minimum interval between advertisements: 450 seconds
- Preference: 0

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
10.0	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

If you change the **maxadvertinterval** value, the other two values also change, so it is important to change the **maxadvertinterval** value before changing either the **holdtime** or **minadvertinterval** values.

The **ip irdp multicast** command allows for compatibility with Sun Microsystems Solaris, which requires IRDP packets to be sent out as multicasts. Many implementations cannot receive these multicasts; ensure end-host ability before using this command.

Examples

The following example sets the various IRDP processes:

```
Router(config)# interface ethernet 0 !Enable irdp on interface Ethernet 0.
Router(config-if)# ip irdp
Router(config-if)# ip irdp multicast !Send IRDP advertisements to the multicast address.
Router(config-if)# ip irdp preference 900 !Increase router preference from 0 to 900.
Router(config-if)# ip irdp maxadvertinterval 400 !Set maximum time between advertisements
to 400 secs.
Router(config-if)# ip irdp minadvertinterval 100 !Set minimum time between advertisements
to 100 secs.
Router(config-if)# ip irdp holdtime 6000 !Advertisements are good for 6000 seconds.
Router(config-if)# ip irdp address 10.108.14.5 !Proxy-advertise 10.108.14.5 with default
router preference.
Router(config-if)# ip irdp address 10.108.14.6 50 !Proxy-advertise 10.108.14.6 with preference
 of 50.
```

Related Commands

Command	Description
show ip irdp	Displays IRDP values.

service-module ip redundancy through show vrrs summary

service-module ip redundancy

To link the primary HSRP interface status to that of the satellite interface, use the **service-module ip redundancy** command in satellite interface configuration mode. To remove the link between the primary HSRP interface status and the satellite interface status, use the **no** form of this command.

service-module ip redundancy *group-name*

no service-module ip redundancy *group-name*

Syntax Description

group-name	Name of the hot standby group. This name must match the hot standby group name configured for the primary HSRP interface, which is typically an Ethernet interface.

Command Default

HSRP is disabled.

Command Modes

Satellite interface configuration (config-if)

Command History

Release	Modification
12.3(14)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

Use the **service-module ip redundancy** command only when you have two Cisco IP VSAT satellite WAN network modules (NM-1VSAT-GILAT) on separate HSRP-redundant routers that connect to the same outdoor unit (ODU).

This command enables the satellite interface to spoof the line protocol UP state.

Examples

The following example shows how to link the primary HSRP interface status to that of the satellite interface:

```
Router (config-if)# service-module ip redundancy grp-hsrp
```

Related Commands

Command	Description
standby ip	Activates HSRP.
standby name	Configures the name of the hot standby group.
standby preempt	Enables preemption on the router and optionally configures a preemption delay.
standby track	Configures an interface so that the hot standby priority changes based on the availability of other interfaces.

show glbp

To display Gateway Load Balancing Protocol (GLBP) information, use the **show glbp** command in privileged EXEC mode.

capability [*interface-type interface-number*]| [[*interface-type interface-number* [*group-number*] [*state*] **[brief] [detail] client-cache** [**age** *number*] [**forwarder** *number*]]| **mac-address** *address*| **[summary]**]

Syntax Description

interface-type interface-number	(Optional) Interface type and number for which output is displayed.
group-number	(Optional) GLBP group number in the range from 0 to 1023.
state	(Optional) State of the GLBP router, one of the following: **active**, **disabled**, **init**, **listen**, and **standby**.
brief	(Optional) Summarizes each virtual gateway or virtual forwarder with a single line of output.
detail	(Optional) Displays all the status of the GLBP router in detailed format. The available status are: **active**, **disabled**, **init**, **listen**, **speak**, and **standby**.
capability	(Optional) Displays the GLBP capability interfaces.
client-cache	(Optional) Displays the GLBP client cache.
age *number*	(Optional) Displays the client-cache age in the range from 0 to 1440.
forwarder *number*	(Optional) Displays the client forwarder in the range from 1 to 4.
mac-address *address*	(Optional) Displays the mac-address of the client.
summary	(Optional) Displays the summary of the GLBP client caches.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(14)S	This command was introduced.

Release	Modification
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T. The **client-cache** keyword was added.
12.3(2)T	The output was enhanced to display information about Message Digest 5 (MD5) authentication.
12.3(7)T	The output was enhanced to display information about assigned redundancy names to specified groups.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was enhanced to display information about GLBP support of Stateful Switchover (SSO) mode.
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.
12.4(15)T	This command was modified. The **client-cache** keyword was added.
12.4(24)T	This command was modified. The **detail** keyword was added. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
12.2(33)SXI1	This command was modified. The **client-cache** keyword was added. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
12.2(33)SRE	The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.

Usage Guidelines

Use the **show glbp** command to display information about GLBP groups on a router. The **brief** keyword displays a single line of information about each virtual gateway or virtual forwarder. The **client-cache** keyword displays the client cache details and the **capability** keyword displays all GLBP-capable interfaces.

Examples

The following is sample output from the **show glbp** command:

```
Router# show glbp
FastEthernet0/0 - Group 10
  State is Active
    2 state changes, last state change 23:50:33
  Virtual IP address is 10.21.8.10
  Hello time 5 sec, hold time 18 sec
    Next hello sent in 4.300 secs
  Redirect time 600 sec, forwarder time-out 7200 sec
  Authentication MD5, key-string
  Preemption enabled, min delay 60 sec
  Active is local
  Standby is unknown
```

```
  Priority 254 (configured)
  Weighting 105 (configured 110), thresholds: lower 95, upper 105
    Track object 2 state Down decrement 5
  Load balancing: host-dependent
  There is 1 forwarder (1 active)
  Forwarder 1
    State is Active
      1 state change, last state change 23:50:15
    MAC address is 0007.b400.0101 (default)
    Owner ID is 0005.0050.6c08
    Redirection enabled
    Preemption enabled, min delay 60 sec
    Active is local, weighting 105
```

The following is sample output from the **show glbp** command with the **brief** keyword specified:

```
Router# show glbp brief
Interface   Grp  Fwd Pri State    Address         Active router   Standby router
Fa0/0       10   -   254 Active   10.21.8.10       local           unknown
Fa0/0       10   1   7   Active   0007.b400.0101   local           -
```

The following is sample output from the **show glbp** command that displays GLBP group 10:

```
Router# show glbp 10
FastEthernet0/0 - Group 10
  State is Active
    2 state changes, last state change 23:50:33
  Virtual IP address is 10.21.8.10
  Hello time 5 sec, hold time 18 sec
    Next hello sent in 4.300 secs
  Redirect time 600 sec, forwarder time-out 7200 sec
  Authentication MD5, key-string
  Preemption enabled, min delay 60 sec
  Active is local
  Standby is unknown
  Priority 254 (configured)
  Weighting 105 (configured 110), thresholds: lower 95, upper 105
    Track object 2 state Down decrement 5
  Load balancing: host-dependent
  There is 1 forwarder (1 active)
  Forwarder 1
    State is Active
      1 state change, last state change 23:50:15
    MAC address is 0007.b400.0101 (default)
    Owner ID is 0005.0050.6c08
    Redirection enabled
    Preemption enabled, min delay 60 sec
    Active is local, weighting 105
```

The following output shows that the redundancy name has been assigned to the “glbp1” group:

```
Router# show glbp ethernet0/1 1
Ethernet0/1 - Group 1
 State is Listen
   64 state changes, last state change 00:00:54
 Virtual IP address is 10.1.0.7
 Hello time 50 msec, hold time 200 msec
   Next hello sent in 0.030 secs
 Redirect time 600 sec, forwarder time-out 14400 sec
  Authentication text, string “authword”
 Preemption enabled, min delay 0 sec
 Active is 10.1.0.2, priority 105 (expires in 0.184 sec)
 Standby is 10.1.0.3, priority 100 (expires in 0.176 sec)
 Priority 96 (configured)
 Weighting 100 (configured 100), thresholds: lower 95, upper 100
   Track object 1 state Up decrement 10
 Load balancing: round-robin
 IP redundancy name is "glbp1"
  Group members:
   0004.4d83.4801 (10.0.0.0)
   0010.7b5a.fa41 (10.0.0.1)
   00d0.bbd3.bc21 (10.0.0.2) local
```

The following output shows GLBP support for SSO mode on an active RP:

```
Router# show glbp

Ethernet0/0 - Group 1
State is Standby
1 state change, last state change 00:00:20
Virtual IP address is 172.24.1.254
Hello time 3 sec, hold time 10 sec
Next hello sent in 0.232 secs
Redirect time 600 sec, forwarder time-out 14400 sec
Preemption disabled
Active is 172.24.1.2, priority 100 (expires in 7.472 sec)
Standby is local
Priority 100 (default)
Weighting 100 (default 100), thresholds: lower 1, upper 100
Load balancing: round-robin
Group members:
aabb.cc00.0100 (172.24.1.1) local
aabb.cc00.0200 (172.24.1.2)
There are 2 forwarders (1 active)
Forwarder 1
State is Listen
MAC address is 0007.b400.0101 (learnt)
Owner ID is aabb.cc00.0200
Time to live: 14397.472 sec (maximum 14400 sec)
Preemption enabled, min delay 30 sec
Active is 172.24.1.2 (primary), weighting 100 (expires in 9.540 sec)
Forwarder 2
State is Active
1 state change, last state change 00:00:28
MAC address is 0007.b400.0102 (default)
Owner ID is aabb.cc00.0100
Preemption enabled, min delay 30 sec
Active is local, weighting 100
```

The following output shows GLBP support for SSO mode on a standby RP:

```
RouterRP-standby# show glbp

Ethernet0/0 - Group 1
State is Init (standby RP, peer state is Standby)
Virtual IP address is 172.24.1.254
Hello time 3 sec, hold time 10 sec
Redirect time 600 sec, forwarder time-out 14400 sec
Preemption disabled
Active is unknown
Standby is unknown
Priority 100 (default)
Weighting 100 (default 100), thresholds: lower 1, upper 100
Load balancing: round-robin
Group members:
aabb.cc00.0100 (172.24.1.1) local
aabb.cc00.0200 (172.24.1.2)
There are 2 forwarders (0 active)
Forwarder 1
State is Init (standby RP, peer state is Listen)
MAC address is 0007.b400.0101 (learnt)
Owner ID is aabb.cc00.0200
Preemption enabled, min delay 30 sec
Active is unknown
Forwarder 2
State is Init (standby RP, peer state is Active)
MAC address is 0007.b400.0102 (default)
Owner ID is aabb.cc00.0100
Preemption enabled, min delay 30 sec
Active is unknown
```

GLBP support for Stateful Switchover (SSO) mode is enabled by default but may be disabled by the **no glbp sso** command. If GLBP support for SSO mode is disabled, the output of the **show glbp** command on the standby RP will display a warning:

```
RouterRP-standby# show glbp
Ethernet0/0 - Group 1
State is Init (GLBP SSO disabled) <------ GLBP SSO is disabled.
Virtual IP address is 172.24.1.254
Hello time 3 sec, hold time 10 sec
Redirect time 600 sec, forwarder time-out 14400 sec
Preemption disabled
Active is unknown
Standby is unknown
Priority 100 (default)
Weighting 100 (default 100), thresholds: lower 1, upper 100
Load balancing: round-robin
Group members:
aabb.cc00.0100 (172.24.1.1) local
There are 2 forwarders (0 active)
Forwarder 1
State is Init (GLBP SSO disabled)
MAC address is 0007.b400.0101 (learnt)
Owner ID is aabb.cc00.0200
Preemption enabled, min delay 30 sec
Active is unknown
Forwarder 2
State is Init (GLBP SSO disabled)
MAC address is 0007.b400.0102 (default)
Owner ID is aabb.cc00.0100
Preemption enabled, min delay 30 sec
Active is unknown
```

The table below describes the significant fields shown in the displays.

Table 1: show glbp Field Descriptions

Field	Description
FastEthernet0/0 - Group	Interface type and number and GLBP group number for the interface.

Field	Description
State is	State of the virtual gateway or virtual forwarder. For a virtual gateway, the state can be one of the following: • Active--The gateway is the active virtual gateway (AVG) and is responsible for responding to Address Resolution Protocol (ARP) requests for the virtual IP address. • Disabled--The virtual IP address has not been configured or learned yet, but another GLBP configuration exists. • Initial--The virtual IP address has been configured or learned, but virtual gateway configuration is not complete. An interface must be up and configured to route IP, and an interface IP address must be configured. • Listen--The virtual gateway is receiving hello packets and is ready to change to the “speak” state if the active or standby virtual gateway becomes unavailable. • Speak--The virtual gateway is attempting to become the active or standby virtual gateway. • Standby--The gateway is next in line to be the AVG.
	For a virtual forwarder, the state can be one of the following: • Active--The gateway is the active virtual forwarder (AVF) and is responsible for forwarding packets sent to the virtual forwarder MAC address. • Disabled--The virtual MAC address has not been assigned or learned. This is a transitory state because a virtual forwarder changing to a disabled state is deleted. • Initial--The virtual MAC address is known, but virtual forwarder configuration is not complete. An interface must be up and configured to route IP, an interface IP address must be configured, and the virtual IP address must be known. • Listen--The virtual forwarder is receiving hello packets and is ready to change to the “active” state if the AVF becomes unavailable.

Field	Description
Virtual IP address is	The virtual IP address of the GLBP group. All secondary virtual IP addresses are listed on separate lines. If one of the virtual IP addresses is a duplicate of an address configured for another device, it will be marked as “duplicate.” A duplicate address indicates that the router has failed to defend its ARP cache entry.
Hello time, hold time	The hello time is the time between hello packets (in seconds or milliseconds). The hold time is the time (in seconds or milliseconds) before other routers declare the active router to be down. All routers in a GLBP group use the hello- and hold-time values of the current AVG. If the locally configured values are different, the configured values appear in parentheses after the hello- and hold-time values.
Next hello sent in	The time until GLBP will send the next hello packet (in seconds or milliseconds).
Preemption	Whether GLBP gateway preemption is enabled. If enabled, the minimum delay is the time (in seconds) for which a higher-priority nonactive router will wait before preempting the lower-priority active router. This field is also displayed under the forwarder section where it indicates GLBP forwarder preemption.
Active is	The active state of the virtual gateway. The value can be “local,” “unknown,” or an IP address. The address (and the expiration date of the address) is the address of the current AVG. This field is also displayed under the forwarder section where it indicates the address of the current AVF.
Standby is	The standby state of the virtual gateway. The value can be “local,” “unknown,” or an IP address. The address (and the expiration date of the address) is the address of the standby gateway (the gateway that is next in line to be the AVG).
Weighting	The initial weighting value with lower and upper threshold values.
Track object	The list of objects that are being tracked and their corresponding states.

Field	Description
IP redundancy name is	The name of the GLBP group.

Related Commands

Command	Description
glbp ip	Enables GLBP.
glbp timers	Configures the time between hello messages and the time before other routers declare the active GLBP router to be down.
glbp weighting track	Specifies an object to be tracked that affects the weighting of a GLBP gateway.

show standby

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

show standby [*type number* [*group*]] [**all**| **brief**]

Syntax Description

type number	(Optional) Interface type and number for which output is displayed.
group	(Optional) Group number on the interface for which output is displayed.
all	(Optional) Displays information for groups that are learned or do not have the **standby ip** command configured.
brief	(Optional) A single line of output summarizes each standby group.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.2(8)T	The output for the command was made clearer and easier to understand.
12.3(2)T	The output was enhanced to display information about Message Digest 5 (MD5) authentication.
12.3(4)T	The output was enhanced to display information about HSRP version 2.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.4(4)T	IPv6 support was added.
12.4(6)T	The output for this command was enhanced to display information about HSRP master and client groups.
12.4(9)T	The output for this command was enhanced to display information about HSRP group shutdown configuration.
12.4(11)T	The output for this command was enhanced to display information about HSRP Bidirectional Forwarding Detection (BFD) peering.

Release	Modification
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)SXI	The output for this command was enhanced to display information about gratuitous ARP packets.
12.4(24)T	This command was modified. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
12.2(33)SXI1	This command was modified. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
Cisco IOS XE Release 2.4	This command was modified. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
12.2(33)SRE	This command was modified. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
15.3(1)S	This command was integrated into Cisco IOS Release 15.3(1)S.

Usage Guidelines

To specify a group, you must specify an interface type and number.

Examples

The following is sample output from the **show standby** command:

```
Router# show standby

Ethernet0/1 - Group 1
  State is Active
   2 state changes, last state change 00:30:59
  Virtual IP address is 10.1.0.20
   Secondary virtual IP address 10.1.0.21
  Active virtual MAC address is 0004.4d82.7981
   Local virtual MAC address is 0004.4d82.7981 (bia)
  Hello time 4 sec, hold time 12 sec
   Next hello sent in 1.412 secs
  Gratuitous ARP 14 sent, next in 7.412 secs
  Preemption enabled, min delay 50 sec, sync delay 40 sec
  Active router is local
  Standby router is 10.1.0.6, priority 75 (expires in 9.184 sec)
  Priority 95 (configured 120)
   Tracking 2 objects, 0 up
      Down Interface Ethernet0/2, pri 15
      Down Interface Ethernet0/3
Group name is “HSRP1” (cfgd)
Follow by groups:
    Et1/0.3 Grp 2 Active 10.0.0.254 0000.0c07.ac02 refresh 30 secs (next 19.666)
    Et1/0.4 Grp 2 Active 10.0.0.254 0000.0c07.ac02 refresh 30 secs (next 19.491)
  Group name is "HSRP1", advertisement interval is 34 sec
```

The following is sample output from the **show standby** command when HSRP version 2 is configured:

```
Router# show standby

Ethernet0/1 - Group 1 (version 2)
  State is Speak
  Virtual IP address is 10.21.0.10
  Active virtual MAC address is unknown
   Local virtual MAC address is 0000.0c9f.f001 (v2 default)
  Hello time 3 sec, hold time 10 sec
   Next hello sent in 1.804 secs
  Preemption enabled
  Active router is unknown
  Standby router is unknown
  Priority 20 (configured 20)
  Group name is "hsrp-Et0/1-1" (default)
Ethernet0/2 - Group 1
  State is Speak
  Virtual IP address is 10.22.0.10
  Active virtual MAC address is unknown
    Local virtual MAC address is 0000.0c07.ac01 (v1 default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 1.804 secs
  Preemption disabled
  Active router is unknown
  Standby router is unknown
  Priority 90 (default 100)
    Track interface Serial2/0 state Down decrement 10
  Group name is "hsrp-Et0/2-1" (default)
```

The following is sample output from the **show standby** command with the **brief** keyword specified:

```
Router# show standby brief

Interface   Grp Prio P State    Active addr     Standby addr    Group addr
Et0         0   120    Init     10.0.0.1        unknown         10.0.0.12
```

The following is sample output from the **show standby** command when HSRP MD5 authentication is configured:

```
Router# show standby

Ethernet0/1 - Group 1
  State is Active
    5 state changes, last state change 00:17:27
  Virtual IP address is 10.21.0.10
  Active virtual MAC address is 0000.0c07.ac01
    Local virtual MAC address is 0000.0c07.ac01 (default)
  Hello time 3 sec, hold time 10 sec
    Next hello sent in 2.276 secs
  Authentication MD5, key-string, timeout 30 secs
  Preemption enabled
  Active router is local
  Standby router is unknown
  Priority 110 (configured 110)
  Group name is "hsrp-Et0/1-1" (default)
```

The following is sample output from the **show standby** command when HSRP group shutdown is configured:

```
Router# show standby

Ethernet0/0 - Group 1
State is Init (tracking shutdown)
3 state changes, last state change 00:30:59
Track object 100 state Up
Track object 101 state Down
Track object 103 state Up
```

The following is sample output from the **show standby** command when HSRP BFD peering is enabled:

```
Router# show standby

Ethernet0/0 - Group 2
  State is Listen
    2 state changes, last state change 01:18:18
  Virtual IP address is 10.0.0.1
  Active virtual MAC address is 0000.0c07.ac02
    Local virtual MAC address is 0000.0c07.ac02 (v1 default)
  Hello time 3 sec, hold time 10 sec
  Preemption enabled
  Active router is 10.0.0.250, priority 120 (expires in 9.396 sec)
  Standby router is 10.0.0.251, priority 110 (expires in 8.672 sec)
    BFD enabled
  Priority 90 (configured 90)
  Group name is "hsrp-Et0/0-1" (default)
```

The following is sample output from the **show standby** command used to display the state of the standby RP:

```
Router# show standby

GigabitEthernet3/25 - Group 1
State is Init (standby RP, peer state is Active)
Virtual IP address is 10.0.0.1
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0c07.ac01 (v1 default)
Hello time 3 sec, hold time 10 sec
Preemption disabled
Active router is unknown
Standby router is unknown
Priority 100 (default 100)
Group name is "hsrp-Gi3/25-1" (default)
```

The table below describes the significant fields shown in the displays.

Table 2: show standby Field Descriptions

Field	Description
Ethernet - Group	Interface type and number and Hot Standby group number for the interface.

Field	Description
State is	State of local router; can be one of the following: • Active--Indicates the current Hot Standby router. • Standby--Indicates the 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 in the active nor standby state, but if no messages are received from the active or standby router, it will start to speak. • Init or Disabled--Router is not yet ready or able to participate in HSRP, possibly because the associated interface is not up. HSRP groups configured on other routers on the network that are learned via snooping are displayed as being in the Init state. Locally configured groups with an interface that is down or groups without a specified interface IP address appear in the Init state. For these cases, the Active addr and Standby addr fields will show "unknown." The state is listed as disabled in the fields when the **standby ip** command has not been specified. • Init (tracking shutdown)--HSRP groups appear in the Init state when HSRP group shutdown has been configured and a tracked object goes down.
Virtual IP address is, Secondary virtual IP addresses	All secondary virtual IP addresses are listed on separate lines. If one of the virtual IP addresses is a duplicate of an address configured for another device, it will be marked as "duplicate." A duplicate address indicates that the router has failed to defend its ARP (Address Resolution Protocol) cache entry.
Active virtual MAC address	Virtual MAC address being used by the current active router.
Local virtual MAC address	Virtual MAC address that would be used if this router became the active router. The origin of this address (displayed in parentheses) can be "default," "bia," (burned-in address) or "confgd" (configured).

Field	Description
Hello time, hold time	The hello time is the time between hello packets (in seconds) based on the command. The holdtime is the time (in seconds) before other routers declare the active or standby router to be down, based on the **standby timers** command. All routers in an HSRP group use the hello and hold- time values of the current active router. If the locally configured values are different, the variance appears in parentheses after the hello time and hold-time values.
Next hello sent in	Time in which the Cisco IOS software will send the next hello packet (in hours:minutes:seconds).
Gratuitous ARP 14 sent, next in 7.412 secs	Number of the gratuitous ARP packet HSRP has sent and the time in seconds when HSRP will send the next gratuitous ARP packet. This output appears only when HSRP sends gratuitous ARP packets.
Authentication	Authentication type configured based on the **standby authentication** command.
key-string	Indicates a key string is used for authentication. Configured key chains are not displayed.
timeout	Duration (in seconds) that HSRP will accept message digests based on both the old and new keys.
Preemption enabled, sync delay	Indicates whether preemption is enabled. If enabled, the minimum delay is the time a higher-priority nonactive router will wait before preempting the lower-priority active router. The sync delay is the maximum time a group will wait to synchronize with the IP redundancy clients.
Active router is	Value can be “local,” “unknown,” or an IP address. Address (and the expiration date of the address) of the current active Hot Standby router.
Standby router is	Value can be “local,” “unknown,” or an IP address. Address (and the expiration date of the address) of the “standby” router (the router that is next in line to be the Hot Standby router).
BFD enabled	Indicates that BFD peering is enabled on the router.
expires in	Time (in hours:minutes:seconds) in which the standby router will no longer be the standby router if the local router receives no hello packets from it.

Field	Description
Tracking	List of interfaces that are being tracked and their corresponding states. Based on the **standby track** command.
Group name is	The name of the HSRP group.
Follow by groups:	Indicates the client HSRP groups that have been configured to follow this HSRP group.
P	Indicates that the router is configured to preempt.

Related Commands

Command	Description
standby authentication	Configures an authentication string for the HSRP.
standby ip	Activates the HSRP.
standby mac-address	Specifies the virtual MAC address for the virtual router.
standby mac-refresh	Refreshes the MAC cache on the switch by periodically sending packets from the virtual MAC address.
standby preempt	Configures HSRP preemption and preemption delay.
standby priority	Configures Hot Standby priority of potential standby routers.
standby timers	Configures the time between hello messages and the time before other routers declare the active Hot Standby or standby router to be down.
standby track	Configures an interface so that the Hot Standby priority changes based on the availability of other interfaces.
standby use-bias	Configures HSRP to use the BIA 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).

show standby arp gratuitous

To display the number and configured interval of gratuitous Address Resolution Protocol (ARP) packets sent by Hot Standby Router Protocol (HSRP), use the **show standby arp gratuitous** command in user EXEC or privileged EXEC configuration mode.

show standby arp gratuitous [*type number*]

Syntax Description

type number	(Optional) Interface type and number for which output is displayed.

Command Default

The number of user-configured gratuitous ARP packets is not displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

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

Usage Guidelines

This command displays the interface to which HSRP sends gratuitous ARP packets, the interval (in seconds) and the number. Gratuitous ARP packets are sent only when an HSRP group transitions to the Active state.

Examples

The following sample output displays information about HSRP gratuitous ARP packets:

```
Router# show standby arp gratuitous

HSRP Gratuitous ARP
Interface   Interval   Count
Ethernet0/0 3          2
```

Related Commands

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

Command	Description
standby send arp	Configures HSRP to check that all ARP entries for active HSRP addresses are correct prior to sending gratuitous ARP packets.

show standby capability

To display the limitation on how many virtual MAC addresses that some interfaces can listen to, use the **show standby capability** command in user EXEC or privileged EXEC mode.

show standby capability [*type number*]

Syntax Description

type number	(Optional) Interface type and number for which output is displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2	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

HSRP allows up to 256 groups to be configured on each interface, but it is possible that the MAC address filter of the interface does not support that many entries. For example, Versatile Interface Processor (VIP) interfaces only support 32 MAC addresses in their MAC address filter. If more HSRP groups are created than there are address filter entries, then it is likely that the router will stop listening to packets sent to the MAC address of an active HSRP group.

Examples

The following is sample output from the **show standby capability** command:

```
Router# show standby capability

7206VXR * indicates hardware may support HSRP
                                                    |
Interface          Type                          H  Potential Max Groups
FastEthernet0/0    18  DEC21140A                 *  256  (0x60194B00,
0x60194BE8)
FastEthernet1/0    18  DEC21140A                 *  256  (0x60194B00,
0x60194BE8)
Ethernet2/0        61  AmdP2                     *  256  (0x601A252C,
0x601A25E4)
Ethernet2/1        61  AmdP2                     *  256  (0x601A252C,
0x601A25E4)
Ethernet2/2        61  AmdP2                     *  256  (0x601A252C,
0x601A25E4)
Ethernet2/3        61  AmdP2                     *  256  (0x601A252C,
```

```
0x601A25E4)
Ethernet2/4        61  AmdP2                *  256  (0x601A252C,
0x601A25E4)
Ethernet2/5        61  AmdP2                *  256  (0x601A252C,
0x601A25E4)
Ethernet2/6        61  AmdP2                *  256  (0x601A252C,
0x601A25E4)
Ethernet2/7        61  AmdP2                *  256  (0x601A252C,
0x601A25E4)
ATM3/0             74  ENHANCED ATM PA      *  256  LAN emulation
TokenRing4/0       66  HAWKEYE              *  3    HSRP TR functional
addresses (0x6076A590)
TokenRing4/1       66  HAWKEYE              *  3    HSRP TR functional
addresses (0x6076A590)
TokenRing4/2       66  HAWKEYE              *  3    HSRP TR functional
addresses (0x6076A590)
TokenRing4/3       66  HAWKEYE              *  3    HSRP TR functional
addresses (0x6076A590)
Serial5/0          67  M4T                     -
Serial5/1          67  M4T                     -
Serial5/2          67  M4T                     -
Serial5/3          67  M4T                     -
FastEthernet6/0    18  DEC21140A            *  256  (0x60194B00,
0x60194BE8)
VoIP-Null0          102 VoIP-Null                -
```

The table below describes the significant fields in the display.

Table 3: show standby capability Field Descriptions

Field	Description
Interface	Interface type and number for the interface.
Type	Hardware type.
*	Indicates hardware may support HSRP.
Potential Max Groups	An estimate of the number of HSRP groups that a MAC address filter can process for an interface.

show standby delay

To display Hot Standby Router Protocol (HSRP) information about delay periods, use the **show standby delay** command in user EXEC or privileged EXEC mode.

show standby delay [*type number*]

Syntax Description

type number	(Optional) Interface type and number for which output is displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2	This command was introduced.
12.2(14)SX	Support for this command was introduced on 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.

Examples

The following is sample output from the **show standby delay** command:

```
Router# show standby delay

 Interface          Minimum Reload
 Ethernet0/3        1       5
```

The table below describes the significant fields shown in the display.

Table 4: show standby delay Field Descriptions

Field	Description
Interface	Interface type and number.
Minimum	Minimum time (in seconds) to delay HSRP group initialization after an interface comes up.
Reload	Time (in seconds) to delay after the router has reloaded.

Related Commands

Command	Description
standby delay minimum reload	Delays the initialization of HSRP groups.

show standby internal

To display Hot Standby Routing Protocol (HSRP) internal flags and conditions, use the **show standby internal** command in user EXEC or privileged EXEC mode.

show standby internal [*interface-type interface-number* [*group*| **summary [all]**]| **summary**]

Syntax Description

interface-type interface-number	(Optional) Interface type and number for which output is displayed.
group	(Optional) Group number on the interface for which output is displayed. The range is 0 to 255.
summary	(Optional) Displays the number of configured and learned HSRP groups in various states on the interface.
all	(Optional) Displays HSRP groups on all subinterfaces if the specified interface is the main interface.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2	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.
12.2(33)SXI2	This command was modified. The *group* argument and the **summary** and **all** keywords were added.
12.2(33)SRE	This command was modified. The *group* argument and the **summary** and **all** keywords were added.
15.0(1)M	This command was modified. The *group* argument and the **summary** and **all** keywords were added.

Usage Guidelines

The **show standby internal** *interface-type interface-number* **summary** command applies to both the main interface and subinterfaces. When the command is used for the main interface the display output does not include groups on subinterfaces. This command displays all configured and learned HSRP groups in various states on the specified interface or subinterface.

The **show standby internal** *interface-type interface-number* **summary all** command applies only to the main interface, not to subinterfaces. It displays the total number of configured and learned HSRP groups in various states, including groups on all subinterfaces under the main interface.

The **show standby internal summary** command displays all configured and learned HSRP groups in various states on all interfaces.

Examples

The following example shows a configuration example and sample output from the **show standby internal** command for the configuration. The output shows internal flags and hardware and software information for Ethernet interface 2/0. The output shows that HSRP group 1 is configured for priority and preemption, and that the **standby timers** and **standby-use bia** commands have been configured.

```
Router# show standby internal

interface Ethernet2/0
 ip address 10.0.0.254 255.255.0.0
 standby use-bia
 standby version 2
 standby 1 ip 10.0.0.1
 standby 1 timers 2 6
 standby 1 priority 110
 standby 1 preempt

Router# show standby internal

Global           Confg: 0000
Et2/0 If hw      AmdP2, State 0x210040
Et2/0 If hw      Confg: 0001, USEBIA
Et2/0 If hw      Flags: 0000
Et2/0 If sw      Confg: 0040, VERSION
Et2/0 If sw      Flags: 0001, USEBIA
Et2/0 Grp 1      Confg: 0072, IP_PRI, PRIORITY, PREEMPT, TIMERS
Et2/0 Grp 1      Flags: 0000
```

The following sample output from the **show standby internal ethernet0/1 summary all** command shows 400 active configured groups and no active learned groups for Ethernet interface 0/1:

```
Router# show standby internal ethernet 0/1 summary all

             Disable  Init     Learn    Listen   Speak    Standby  Active
Ethernet0/1
Configured     0        0        0        0        0        0        400
Learnt         0        0        0        0        0        0        0
```

The table below describes the significant fields shown in the display.

Table 5: show standby internal summary all Field Description

Field	Description
Disable	Number of HSRP groups in the disabled state. An HSRP group that is in the disabled state is not yet ready or able to participate in HSRP. All learned groups are always in the disabled state.

Field	Description
Init	Number of HSRP groups in the initial state. Locally configured groups with an interface that is down or groups without a specified interface IP address appear in the Init state.
Learn	Number of HSRP groups in the learned state. A group that is learned is neither in the active nor standby state, nor does it have enough information to attempt to claim the active or standby roles.
Listen	Number of HSRP groups in the listen state. A router in the listen state is neither in the active nor standby state, but if no messages are received from the active or standby router, it will start to speak.
Speak	Number of HSRP groups that are sending packets to claim the active or standby role.
Standby	Number of standby HSRP groups.
Active	Number of active HSRP groups.

Related Commands

Command	Description
show standby	Displays HSRP information.

show standby neighbors

To display information about Hot Standby Router Protocol (HSRP) peer routers on an interface, use the **show standby neighbors** command in privileged EXEC mode.

show standby neighbors [*interface-type interface-number*]

Syntax Description

interface-type interface-number	(Optional) Interface type and number for which output is displayed.

Command Default

HSRP neighbor information is displayed for all interfaces.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

Use this command to display information about HSRP peer neighbors. This command displays the HSRP groups for which each neighbor is acting as the active and standby router and whether Bidirectional Forwarding Detection (BFD) peering is enabled for each neighbor.

Examples

The following example displays the HSRP neighbors on Ethernet interface 0/0. Neighbor 10.0.0.250 is active for group 2 and standby for groups 1 and 8, and is registered with BFD:

```
Router# show standby neighbors Ethernet0/0

HSRP neighbors on Ethernet0/0
  10.0.0.250
    Active groups: 2
    Standby groups: 1, 8
    BFD enabled
  10.0.0.251
    Active groups: 5, 8
    Standby groups: 2
    BFD enabled
  10.0.0.253
    No Active groups
    No Standby groups
    BFD enabled
```

The following example displays information for all HSRP neighbors:

```
Router# show standby neighbors

HSRP neighbors on FastEthernet2/0
```

```
  10.0.0.2
    No active groups
    Standby groups: 1
    BFD enabled
HSRP neighbors on FastEthernet2/0
  10.0.0.1
    Active groups: 1
    No standby groups
    BFD enabled
```

The table below describes the significant fields shown in the displays.

Table 6: show standby neighbors Field Descriptions

Field	Description
Active groups	HSRP groups for which an interface is acting as the active peer.
Standby groups	HSRP groups for which an interface is acting as the standby peer.
BFD enabled	Indicates that HSRP BFD peering is enabled.

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.
standby bfd	Reenables HSRP BFD peering for a specified interface if it has been disabled.
standby ip	Activates HSRP.

show standby redirect

To display Internet Control Message Protocol (ICMP) redirect information on interfaces configured with the Hot Standby Router Protocol (HSRP), use the **show standby redirect** command in user EXEC or privileged EXEC mode.

show standby redirect [*ip-address*| *interface-type interface-number* [**active**| **passive**| **timers**]]

Syntax Description

ip-address	(Optional) Router IP address.
interface-type interface-number	(Optional) Interface type and number for which output is displayed.
active	(Optional) Active HSRP routers on the subnet.
passive	(Optional) Passive HSRP routers on the subnet.
timers	(Optional) HSRP ICMP redirect timers.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2	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.

Examples

The following is sample output from the **show standby direct** command with no optional keywords:

```
Router# show standby redirect

Interface          Redirects Unknown   Adv      Holddown
Ethernet0/2        enabled   enabled   30       180
Ethernet0/3        enabled   disabled  30       180
Active          Hits   Interface          Group Virtual IP      Virtual MAC
10.19.0.7       0      Ethernet0/2        3     10.19.0.13      0000.0c07.ac03
local           0      Ethernet0/3        1     10.20.0.11      0000.0c07.ac01
local           0      Ethernet0/3        2     10.20.0.12      0000.0c07.ac02
Passive         Hits   Interface          Expires in
10.19.0.6       0      Ethernet0/2        151.800
```

The table below describes the significant fields in the display.

Table 7: show standby redirects Field Descriptions

Field	Description
Interface	Interface type and number for the interface.
Redirects	Indicates whether redirects are enabled or disabled on the interface.
Unknown	Indicates whether redirects to an unknown router are enabled or disabled on the interface.
Adv	Number indicating the passive router advertisement interval in seconds.
Holddown	Number indicating the passive router hold interval in seconds.
Active	Active HSRP routers on the subnet.
Hits	Number of address translations required for ICMP information.
Interface	Interface type and number for the interface on the active router.
Group	Hot standby group number.
Virtual IP	Virtual IP address of the active HSRP router.
Virtual MAC	Virtual MAC address of the active HSRP router.
Passive	Passive HSRP routers on the subnet.
Hits	Number of address translations required for ICMP information.
Interface	Interface type and number for the interface on the passive router.
Expires in	Time in seconds for a virtual IP to expire and the holddown time to apply for filtering routes to the standby router.

The following is sample output from the **show standby redirect** command with a specific interface Ethernet 0/3:

```
Router# show standby redirect e0/3

Interface          Redirects Unknown   Adv      Holddown
Ethernet0/3        enabled   disabled  30       180
```

```
Active          Hits   Interface          Group Virtual IP      Virtual MAC
local           0      Ethernet0/3        1     10.20.0.11      0000.0c07.ac01
local           0      Ethernet0/3        2     10.20.0.12      0000.0c07.ac02
```

The following is sample output from the **show standby redirect** command showing all active routers on interface Ethernet 0/3:

```
Router# show standby redirect e0/3 active

Active          Hits   Interface          Group Virtual IP      Virtual MAC
local           0      Ethernet0/3        1     10.20.0.11      0000.0c07.ac01
local           0      Ethernet0/3        2     10.20.0.12      0000.0c07.ac02
```

The following is sample output from the **show standby redirect** *ip-address* command, where the IP address is the real IP address of the router:

```
Router# show standby redirect 10.19.0.7

Active          Hits   Interface          Group Virtual IP      Virtual MAC
10.19.0.7       0      Ethernet0/2        3     10.19.0.13      0000.0c07.ac03
```

Related Commands

Command	Description
show standby	Displays the HSRP information.
standby redirects	Enables ICMP redirect messages to be sent when HSRP is configured on an interface.

show vrrp

To display the status of configured Virtual Router Redundancy Protocol (VRRP) groups on a device, use the **show vrrp** command in privileged EXEC mode.

show vrrp *group number* [**Ethernet| ipv4| ipv6| all| brief| detail| statistics**]

Syntax Description

group number	VRRP group number. The range is from 1 to 255.
Ethernet	(Optional) Displays Ethernet information for IEEE 802.3.
ipv4	(Optional) Displays information about IPv4 groups.
ipv6	(Optional) Displays information about IPv6 groups.
all	(Optional) Displays information about all VRRP groups, including groups in a disabled state.
brief	(Optional) Displays a summary view of the VRRP group information.
detail	(Optional) Displays information about all VRRP groups, including statistical information.
statistics	(Optional) Displays statistical information about the VRRP groups.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.3(2)T	This command was enhanced to display the state of a tracked object.
12.3(14)T	This command was enhanced to display message digest algorithm 5 (MD5) authentication for a VRRP using text strings, key chains, or key strings.

Release	Modification
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.
12.2(33)SRC	This command was enhanced to display synchronized state information from the active Route Processor (RP).
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.4(24)T	This command was modified. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.
Cisco IOS XE Release 2.6	This command was modified. The output was modified to display information about configured Virtual Router Redundancy Service (VRRS) names.
15.3(3)M	This command was modified. The output was modified to display information about a tracking object.

Usage Guidelines

If no group is specified, the status for all groups is displayed.

Examples

The following is sample output from the **show vrrp** command:

```
Device# show vrrp

Ethernet1/0 - Group 1
State is Master
Virtual IP address is 10.2.0.10
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3.000 sec
Preemption is enabled
 min delay is 0.000 sec
Priority 100
 Track object 1 state down decrement 15
Master Router is 10.2.0.1 (local), priority is 100
Master Advertisement interval is 3.000 sec
Master Down interval is 9.609 sec
Ethernet1/0 - Group 2
State is Master
Virtual IP address is 10.0.0.20
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 1.000 sec
Preemption is enabled
 min delay is 0.000 sec
Priority 95
Master Router is 10.0.0.1 (local), priority is 95
Master Advertisement interval is 1.000 sec
Master Down interval is 3.628 sec
```

The following is sample output from the **show vrrp** command, displaying peer RP state information:

```
Device# show vrrp

Ethernet0/0 - Group 1
  State is Init (standby RP, peer state is Master)
  Virtual IP address is 172.24.1.1
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 255
  Master Router is 172.24.1.1 (local), priority is 255
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.003 sec
```

The following sample output displays information about a configured VRRS group name:

```
Device# show vrrp

 GigabitEthernet0/0/0 - Group 1
State is Master
Virtual IP address is 10.0.0.7
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 1.000 sec
Preemption enabled
Priority is 100
VRRS Group name CLUSTER1 ! Configured VRRS Group Name
Master Router is 10.0.0.1 (local), priority is 100
Master Advertisement interval is 1.000 sec
Master Down interval is 3.609 sec
```

The following is sample output from the **show vrrp** command when an object is being tracked:

```
Device# show vrrp

Ethernet0/0 - Group 1 - Address-Family IPv4
  State is BACKUP
  State duration 1 mins 41.856 secs
  Virtual IP address is 172.24.1.253
  Virtual MAC address is 0000.5E00.0101
  Advertisement interval is 1000 msec
  Preemption enabled
  Priority is 80 (configured 100)
    Track object 1 state Down decrement 20
  Master Router is 172.24.1.2, priority is 100
  Master Advertisement interval is 1000 msec (learned)
  Master Down interval is 3609 msec (expires in 3297 msec)
```

The table below describes the significant fields shown in the displays.

Table 8: show vrrp Field Descriptions

Field	Description
Ethernet1/0 - Group	Interface type and number, and VRRP group number.
State is	Role this interface plays within VRRP (master or backup).

Field	Description
Advertisement interval is	Interval at which the device will send VRRP advertisements when it is the master virtual device. This value is configured with the **vrrp timers advertise** command.
Priority	Priority of the interface.
Track object	Object number representing the object to be tracked.
state	State value (up or down) of the object being tracked.
decrement	Amount by which the priority of the device is decremented (or incremented) when the tracked object goes down (or comes back up).
Master Router is	IP address of the current master virtual device.
priority is	Priority of the current master virtual device.
Master Advertisement interval is	Advertisement interval, in seconds, of the master virtual device.
Master Down interval is	Calculated time, in seconds, that the master virtual device can be down before the backup virtual device takes over.

The following is sample output from the **show vrrp** command with the **brief** keyword:

```
Device# show vrrp brief

Interface          Grp  A-F Pri  Time Own Pre State   Master addr/Group addr
  Et1/0              1 IPv4 150     0  N   Y  MASTER  10.0.0.1(local) 10.0.0.10
  Et1/0              1 IPv6 100     0  N   Y  INIT    AF-UNDEFINED no address
  Et1/0              6 IPv6 150     0  N   Y  MASTER  FE80::1(local) FE80::100
```

The table below describes the significant fields shown in the display.

Table 9: show vrrp brief Field Descriptions

Field	Description
Interface	Interface type and number.
Grp	VRRP group to which this interface belongs.
Pri	VRRP priority number for this group.
Time	Calculated time that the master virtual device can be down before the backup virtual device takes over.

Field	Description
Own	IP address owner.
Pre	Preemption status. Y indicates that preemption is enabled. If this field is empty, preemption is disabled.
State	Role this interface plays within VRRP (master or backup).
Master addr	IP address of the master virtual device.
Group addr	IP address of the virtual device.

Related Commands

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

show vrrp interface

To display the Virtual Router Redundancy Protocol (VRRP) groups and their status on a specified interface, use the **show vrrp interface** command in user EXEC or privileged EXEC mode.

show vrrp interface *type number* **[brief]**

Syntax Description

type	Interface type.
number	Interface number.
brief	(Optional) Provides a summary view of the group information.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.4(24)T	This command was modified. The output was modified to hide configured passwords when MD5 key-string or text authentication is configured.

Examples

The following is sample output from the **show vrrp interface**command:

```
Router# show vrrp interface ethernet 1/0
```

```
Ethernet1/0 - Group 1
State is Master
Virtual IP address is 10.2.0.10
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3.000 sec
Preemption enabled, delay min 4 secs
Priority is 100
Master Router is 10.2.0.1 (local), priority is 100
Master Advertisement interval is 3.000 sec
Master Down interval is 9.609 sec
Ethernet1/0 - Group 2
State is Master
Virtual IP address is 10.0.0.20
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 1.000 sec
Preemption enabled, delay min 2 sec
Priority is 95
Authentication MD5, key-string
Master Router is 10.0.0.1 (local), priority is 95
Master Advertisement interval is 1.000 sec
Master Down interval is 3.628 sec
```

The table below describes the significant fields shown in the display.

Table 10: show vrrp interface Field Descriptions

Field	Description
Ethernet1/0 - Group 1	Interface type and number, and VRRP group number.
State is	Role this interface plays within VRRP (master or backup).
Virtual IP address is	Virtual IP address for this group.
Virtual MAC is	Virtual MAC address for this group.
Advertisement interval is	Interval at which the router will send VRRP advertisements when it is the master virtual router. This value is configured with the **vrrp timers advertise** command.
Preemption	Preemption is either enabled or disabled.
delay min	If preemption is enabled, delay min is the minimum time (in seconds) that a router will wait before preempting the current master router. This field is displayed only if the delay is set at greater than 0 seconds.
Authentication MD5, key-string	The currently configured authentication mechanism for this group. Possible values for this field include “MD5” for Message Digest 5 encryption, as shown in the example above. Other messages not displayed in the example include “text, string “‘my_secret_password’” for plain text and “key-chain ‘the_chain_i’m_looking_at’.”

Field	Description
Priority is 100	Priority of this group on this interface.
Master Router is 10.2.0.1 (local)	IP address of the current master virtual router.
Priority is 100	Priority of the current master router.
Master Advertisement interval	Advertisement interval of the master virtual router.
Master Down interval	Calculated time that the master virtual router can be down before the backup virtual router takes over.

Related Commands

Command	Description
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.
vrrp timers advertise	Configures the interval between successive advertisements by the master virtual router in a VRRP group.

show vrrs

To display information associated with Virtual Router Redundancy Service (VRRS), use the **show vrrs** command in privileged EXEC mode.

show vrrs {**client** [*vrrs-client-name*]| **pathway** [**Ethernet** *number*]| **server** [**GLBP** [*vrrs-server-name*]| **HSRP** [*vrrs-server-name*]| **VRRP** [*vrrs-server-name*]]| **tag** [*vrrs-tag-name*]}

Syntax Description

client *vrrs-client-name*	Displays information about the VRRS client. Optionally, you can specify the VRRS client name.
pathway	Displays information about the VRRS pathway.
Ethernet *number*	(Optional) Displays information about the ethernet interface used for the VRRS pathway.
server	Displays information about the VRRS server.
GLBP	(Optional) Displays information about the Group Load Balancing Protocol (GLBP) server.
HSRP	(Optional) Displays information about the Hot Standby Redundancy Protocol (HSRP) server.
VRRP	(Optional) Displays information about the Virtual Router Redundancy Protocol (VRRP) server.
vrrs-server-name	(Optional) Specifies the VRRS server name.
tag *vrrs-tag-name*	Displays information about the VRRS tag. Optionally, you can specify the VRRS tag name.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.3(1)S	This command was introduced.
Cisco IOS XE Release 3.8S	This command was introduced.

Usage Guidelines

You must configure the VRRS pathway by defining the First Hop Redundancy Protocol (FHRP) groups and configuring the interfaces that require redundant virtual gateway.

Examples

The following is sample output from the **show vrrs** command with the **pathway** keyword for an “active” pathway with tag name “group1” and VRRP in master state on the VLAN interface:

```
  Device# show vrrs pathway

  Pathway ["group1"@Vlan42]
  State is ACTIVE [VRRS push "ACTIVE"]
  Virtual MAC is fe24.fe24.fe24 [Active] (0)
  Address-family is v4
  Options: Default Pathway=0, Owner Mode=0, Accept-Mode=1, Configured vMAC=1
  Evaluation: No Shut=1, Connected=1, OIR=1, L2 Ready=1, L3 Ready=1, vMAC Ready=1, vIP
Ready=1
  Virtual Address List: 192.168.42.254
```

The following is sample output from the **show vrrs** command with the **pathway** keyword for a “not ready” pathway with tag name “group1” and VRRP in shutdown state on the ethernet 0/1 interface:

```
  Device# show vrrs pathway

  Pathway ["group1"@Et0/1]
  State is NOT READY [VRRS push "INIT"]
  Virtual MAC is 0101.0101.0101 [Reserved] (0)
  Address-family is v4
  Options: Default Pathway=0, Owner Mode=0, Accept-Mode=1, Configured vMAC=1
  Evaluation: No Shut=1, Connected=1, OIR=1, L2 Ready=1, L3 Ready=1, vMAC Ready=1, vIP
Ready=1
  Virtual Address List: 192.168.42.254
```

The following is sample output from the **show vrrs** command with the **pathway** keyword for a “inactive” pathway with tag name “group1” and VRRP in backup state on the ethernet 0/1 interface:

```
  Device# show vrrs pathway

  Pathway ["group1"@Et0/1]
  State is INACTIVE [VRRS push "BACKUP"]
  Virtual MAC is 0101.0101.0101 [Reserved] (0)
  Address-family is v4
  Options: Default Pathway=0, Owner Mode=0, Accept-Mode=1, Configured vMAC=1
  Evaluation: No Shut=1, Connected=1, OIR=1, L2 Ready=1, L3 Ready=1, vMAC Ready=1, vIP
Ready=1
  Virtual Address List: 192.168.42.254
```

The following is sample output from the **show vrrs** command with the **server** keyword with a tag name “group1”:

```
  Device# show vrrs server

  Server Name: vrrpVlan40
  Address Family: IPv4
  Interface: Ethernet0/0
  State: ACTIVE
  vMAC: 0000.5E00.0101
  vIP Address: 172.16.1.254
  Tags Connected:
  Tag Name group1
```

The table below describes the significant fields shown in the displays.

Field	Description
Pathway	
State	
Virtual MAC	
Address-family	
Options	
Default Pathway	
Owner Mode	
Accept-Mode	
Configured vMAC	
Evaluation	
No Shut	
Connected	
OIR	
L2 Ready	
L3 Ready	
vMAC Ready	
vIP Ready	
Virtual Address List	
Interface	
vMAC	
vIP Address	
Tags Connected	

Related Commands

Command	Description
show vrrs clients	Displays a list of VRRS clients.
show vrrs group	Displays information about VRRS groups.
show vrrs summary	Displays a summary of all VRRS groups.

show vrrs clients

To display a list of Virtual Router Redundancy Service (VRRS) clients, use the **show vrrs clients** command in user EXEC or privileged EXEC mode.

show vrrs clients

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#) User EXEC (>)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **show vrrs clients** command to display a list of VRRS clients currently active on the router. The display contains the client IDs, client priority, whether the client is interested in all VRRS groups, and the client name.

The client ID is a dynamic integer value assigned to the client when it registers with VRRS. If the client ID for a particular client is different between two versions of a Cisco IOS XE image, it means there is a change in initialization order in the two images.

The client priority is a priority that the client chooses during registration with VRRS. The client priority dictates the order in which clients receive server notifications.

Examples

The following example displays a list VRRS clients:

```
Router# show vrrs clients

ID  Priority  All-groups  Name
------------------------------
1   High      No          VRRS-Plugins
2   Low       Yes         VRRS-Accounting
3   Normal    No          PPPOE-VRRS-CLIENT
```

The table below describes the significant fields shown in the display.

Table 11: show vrrs clients Field Descriptions

Field	Description
Priority	Priority of the client.
All-groups	Indicates whether a client is registered for all current and future VRRS groups.

Field	Description
Name	Name of the client.

Related Commands

Command	Description
show vrrp	Displays a brief or detailed status of one or all configured VRRP groups on the router.
show vrrs group	Display information about VRRS groups.
show vrrs plugin database	Displays details about the internal VRRS plug-in database.
show vrrs summary	Displays a summary of all VRRS groups.

show vrrs group

To display information about Virtual Router Redundancy Service (VRRS) groups, use the **show vrrs group** command in user EXEC or privileged EXEC mode.

show vrrs group [*group-name*]

Syntax Description

group-name	Name of a VRRS group.

Command Default

Information about all VRRS groups is displayed.

Command Modes

Privileged EXEC (#) User EXEC (>)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **show vrrs group** command to display details of a VRRS redundancy group, if a group name is specified. If no group name is specified, details of all VRRS groups configured or added by clients on the router are displayed.

Examples

The following example displays information about all currently configured VRRS groups:

```
Router# show vrrs group

DT-CLUSTER-3
Server Not configured, state INIT, old state INIT, reason Protocol
  Address family IPv4, Virtual address 0.0.0.0, Virtual mac 0000.0000.0000
  Active interface address 0.0.0.0, standby interface address 0.0.0.0
Client 5 VRRS TEST CLIENT, priority Low
DT-CLUSTER-2
Server VRRP, state BACKUP, old state INIT, reason HA SSO
  Address family IPv4, Virtual address 10.1.1.1, Virtual mac 0000.5e00.0102
  Active interface address 10.1.1.3, standby interface address 10.1.1.2
Client 1 VRRS-Plugins, priority High
Client 2 VRRS-Accounting, priority Low
Client 3 PPPOE-VRRS-CLIENT, priority Normal
DT-CLUSTER-1
Server VRRP, state ACTIVE, old state INIT, reason HA SSO
  Address family IPv4, Virtual address 10.1.1.1, Virtual mac 0000.5e00.0101
  Active interface address 10.1.1.2, standby interface address 10.0.0.0
Client 1 VRRS-Plugins, priority High
Client 2 VRRS-Accounting, priority Low
Client 3 PPPOE-VRRS-CLIENT, priority Normal
```

The table below describes the significant fields shown in the display.

Table 12: show vrrs group Field Descriptions

Field	Description
state	Current state of the server.
old state	Previous state of the server
reason	Reason for the last server state change.
Address family IPv4	Address family for this VRRS group.
Virtual address 0.0.0.0	Virtual IP address for this VRRS group.
Virtual mac 0000.0000.0000	Virtual MAC address for this VRRS group.
Client 1	Client ID of a VRRS client.
VRRS-Plugins	Client name.
priority High	Priority of this client.

Related Commands

Command	Description
show vrrp	Displays a brief or detailed status of one or all configured VRRP groups on the router.
show vrrs clients	Displays a list of VRRS clients.
show vrrs plugin database	Displays details about the internal VRRS plug-in database.
show vrrs summary	Displays a summary of all VRRS groups.

show vrrs plugin database

To display details about the internal Virtual Router Redundancy Service (VRRS) plug-in database, use the **show vrrs plugin database** command in user EXEC or privileged EXEC mode.

show vrrs plugin database

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#) User EXEC (>)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **show vrrs plugin database** command to display details of the internal VRRS plug-in database. This command maps an interface-specific configuration with a VRRS redundancy group.

The output display includes; name, server connection status, VRRS State (simple), MAC address, test control indicator, VRRS client handle, and the plug-in interface list.

Examples

The following example displays information about the internal VRRS plug-in database:

```
Router# show vrrs plugin database

VRRS Plugin Database
------------------------------------------------
Name = VRRS_NAME_1
Server connection = Live
State = Disabled
MAC addr = 0000.5e00.0101
Test Control = False
Client Handle = 3741319170
Interface list =
                 gige0/0/0.2
                 gige0/0/0.3
------------------------------------------------
Name = VRRS_NAME_2
Server connection = Diconnected
State = Disabled
MAC addr = 0000.0000.0000
Test Control = False
Client Handle = 603979779
Interface list =
                 gige0/0/0.4
------------------------------------------------
```

Related Commands

Command	Description
show vrrp	Displays a brief or detailed status of one or all configured VRRP groups on the router.
show vrrs clients	Displays a list of VRRS clients.
show vrrs group	Display information about VRRS groups.
show vrrs summary	Displays a summary of all VRRS groups.

show vrrs summary

To display a summary of all Virtual Router Redundancy Service (VRRS) groups, use the **show vrrs summary** command in user EXEC or privileged EXEC configuration mode.

show vrrs summary

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#) User EXEC (>)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **show vrrs summary** command to display a summary of VRRS groups either configured on a router or added by a client. The display includes the following group information: name, server, state, and virtual address.

Examples

The following example displays a summary of VRRS groups:

```
Router# show vrrs summary

Group                                                Server State Virtual-address
------------------------------------------------------------------------------- DT-CLUSTER-3
                                           UNKNOW INIT   0.0.0.0
DT-CLUSTER-2                                         VRRP   BACKUP 10.1.1.1
DT-CLUSTER-1                                         VRRP   ACTIVE 10.1.1.2
```

The table below describes the significant fields shown in the display.

Table 13: show vrrs summary Field Descriptions

Field	Description
Group	VRRS group name.
Server	The server which serves the VRRS group.
State	State of the server for the VRRS group.
Virtual-address	Virtual address associated with the VRRS group.

Related Commands

Command	Description
show vrrp	Displays a brief or detailed status of one or all configured VRRP groups on the router.
show vrrs clients	Displays a list of VRRS clients.
show vrrs group	Display information about VRRS groups.
show vrrs plugin database	Displays details about the internal VRRS plug-in database.

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.
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.

Release	Modification
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.

Command	Description
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.

Command	Description
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 reload *min-seconds* **reload** *reload-seconds*

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

Syntax Description

min-seconds	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. The recommended value is 30 seconds.
reload-seconds	Time (in seconds) to delay after the router has reloaded. This delay period applies only to the first interface-up event after the router has reloaded. The valid rang is 0 to 300 seconds. The default is 5 seconds. The recommended value is 60 seconds.

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.

Usage Guidelines

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

However, in some cases, even if the **standby preempt** command is not configured, the former active router 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 router resumes the active role.

We recommend that all HSRP routers 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 120 seconds:

```
Router(config)# interface ethernet 0
Router(config-if)# ip address 10.20.0.7 255.255.0.0
Router(config-if)# standby delay minimum 30 reload 60
Router(config-if)# standby 3 ip 10.20.0.21
Router(config-if)# standby 3 timers msec 300 msec 700
Router(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 routers declare the active HSRP or standby router 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.

Release	Modification
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-length*| *link-local-address*| **autoconfig**}

no standby [*group-number*] **ipv6** {*ipv6-global-address*| *ipv6-address /prefix-length*| *ipv6-prefix /prefix-length*| *link-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 14: 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** | **reload** | **sync**}*seconds*]

no standby [*group-number*] **preempt** [**delay**{**minimum** | **reload**| **sync**}*seconds*]

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 router to postpone taking over the active role for a minimum number of seconds since that router 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 router has reloaded.
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 router wants to preempt, it will do so immediately. By default, the router 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.

Release	Modification
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.
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 Guidelin

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

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

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 router reloads. This provides stabilization of the router 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:

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

Examples

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

```
Router(config)# interface ethernet 0
Router(config-if)# standby ip 172.19.108.254
Router(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.

Release	Modification
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.

Release	Modification
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.

Command	Description
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.

Release	Modification
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.

Examples

```
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
```

Examples

```
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 Guidelin

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.

vrrp authentication through vrrs mac-address

vrrp authentication

To authenticate Virtual Router Redundancy Protocol (VRRP) packets received from other routers in the group, use the **vrrp authentication** command in interface configuration mode. To disable VRRP authentication, use the **no** form of this command.

vrrp *group* **authentication** {*text-string*| **text** *text-string*| **md5** {**key-chain** *key-chain*| **key-string** [**0**| **7**] *key-string* [**timeout** *seconds*]}}

no vrrp *group* **authentication** {*text-string*| **text** *text-string*| **md5** {**key-chain** *key-chain*| **key-string** [**0**| **7**] *key-string* [**timeout** *seconds*]}}

Syntax Description

group	Virtual router group number for which authentication is being configured. The group number is configured with the **vrrp ip** command. The valid range is 1 to 255.
text-string	Plain text authentication. There is no default value.
text *text-string*	Plain text authentication. The *text-string* argument is the authentication string and can be up to eight alphanumeric characters. There is no default value.

md5	Message digest 5 (MD5) authentication. The arguments and keywords are as follows: • **key-chain —**Authentication using a live key and key ID. The *key-chain* argument specifies a string and must match the assigned key-chain name using the **key chain** command. • **key-string —**Specifies the secret key for the MD5 authentication string. The arguments and keywords are as follows: • **0—**(Optional) The key is unencrypted. • **7—**(Optional) The key is encrypted. • *key-string***—**Up to 64 characters. It is recommended that the string be at least 16 characters. No prefix to the *key-string* argument means that the key is unencrypted. • **timeout** *seconds***—**(Optional) Duration in seconds that VRRP will accept message digests based on both the old and new keys. **Note** The key-string authentication method is encrypted if the **service password-encryption** command has been specified.

Command Default

VRRP authentication is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.3(14)T	The **md5**, **key-string**, **0**, **7**, and **key-chain** keywords were added. The *text-string*, *key-string*, and *key-chain* arguments were added.

Release	Modification
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(31)SG	This command was integrated into Cisco IOS Release 12.2(31)SG.
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

VRRP does not accept a virtual router group number 0 and never has an empty group. The valid range for the VRRP group is 1 to 255.

When a VRRP packet arrives from another router in the VRRP group, its authentication string is compared to the string configured on the local system. If the strings match, the message is accepted. If they do not match, the packet is discarded. The authentication string is sent unencrypted in all VRRP messages when using the **vrrp authentication text** *text-string* option.

All routers within the VRRP group must be configured with the same authentication string. If the same authentication string is not configured, the routers in the VRRP group will not communicate with each other and any misconfigured router in the group will change its state to master.

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

Note Plain text authentication is not meant to be used for security. It simply provides a way to prevent a router that does not belong to a configured VRRP group from participating in it.

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

Examples

The following example shows how to configure an authentication text string of x30dn78k:

```
Router(config-if)# vrrp 1 authentication x30dn78k
```

The following example shows how to configure an MD5 key string:

```
Router(config)# interface Ethernet0/1
Router(config-if)# description ed1-cat5a-7/10
Router(config-if)# vrrp 1 ip 10.21.0.10
Router(config-if)# vrrp 1 priority 110
Router(config-if)# vrrp 1 authentication md5 key-string f00c4s
```

The key ID for key-string authentication is always zero. If a key chain is configured with a key ID of zero, then the following configuration will work:

Examples

```
Router(config)# key chain vrrp1
Router(config-keychain)# key 0
Router(config-keychain-key)# key-string 54321098452103ab
!
Router(config)# interface Ethernet0/1
Router(config-if)# vrrp 1 ip 10.21.0.10
Router(config-if)# vrrp 1 authentication md5 key-chain vrrp1
```

Examples

```
Router(config)# interface Ethernet0/1
Router(config-if)# vrrp 1 ip 10.21.0.10
Router(config-if)# vrrp 1 authentication md5 key-string 54321098452103ab
```

Related Commands

Command	Description
key chain	Enables authentication for routing protocols.
service password-encryption	Encrypts passwords.
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.
vrrp timers advertise	Configures the interval between successive advertisements by the master virtual router in a VRRP group.

vrrp delay

To configure the delay period before the initialization of all Virtual Router Redundancy Protocol (VRRP) groups on an interface, use the **vrrp delay** command in interface configuration mode. To remove all configured delays, use the **no** form of this command.

vrrp delay {**minimum** *seconds* [**reload** *seconds*]| **reload** *seconds*}

no vrrp delay {**minimum** *seconds* [**reload** *seconds*]| **reload** *seconds*}

Syntax Description

minimum *seconds*	The minimum time, in seconds, to delay VRRP group initialization after an interface comes up. Valid range is 1-10000.
reload *reload-seconds*	Time, in seconds, to delay after the router has reloaded. Valid range is 0-10000.

Command Default

No delay value is used.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **vrrp delay** command to configure the delay period before the initialization of VRRP groups. This command applies to all VRRP groups on an interface. This command cannot be configured per-VRRP group.

The **minimum** *seconds* value is the minimum time (in seconds) to delay VRRP group initialization after an interface comes up. This minimum delay period applies to all subsequent interface events.

The **reload** *seconds* value is the time period to delay after the router has reloaded. This delay period applies only to the first interface-up event after the router has reloaded.

The recommended **minimum** *seconds* value is 30 seconds and the recommended **reload** *seconds* value is 60 seconds.

The **no vrrp delay** command removes all delays, and is equivalent to configuring 0 for each argument. When the **no vrrp delay** command is configure, there is no appreciable delay between the interface coming up and the VRRP groups on that interface becoming operational.

Examples

The following example shows how to configure a minimum delay of 30 seconds and a reload delay of 60 seconds:

```
Router(config)# interface gigabitethernet0/0/0
Router(config-if)# vrrp delay minimum 30 reload 60
```

Related Commands

Command	Description
vrrp name	Links a VRRS client to a VRRP group.

vrrp description

To assign a description to the Virtual Router Redundancy Protocol (VRRP) group, use the **vrrp description** command in interface configuration mode. To remove the description, use the **no** form of this command.

vrrp *group* **description** *text*

no vrrp *group* **description**

Syntax Description

group	Virtual router group number. The group number range is from 1 to 255.
text	Text (up to 80 characters) that describes the purpose or use of the group.

Command Default

There is no description of the VRRP group.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Examples

The following example enables VRRP on Ethernet interface 0. VRRP group 1 is described as Building A – Marketing and Administration.

```
Router(config)# interface ethernet 0
Router(config-if)# ip address 10.0.1.1 255.255.255.0
!
Router(config-if)# vrrp 1 ip 10.0.1.20
Router(config-if)# vrrp 1 description Building A - Marketing and Administration
```

Related Commands

Command	Description
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.

vrrp ip

To enable the Virtual Router Redundancy Protocol (VRRP) on an interface and identify the IP address of the virtual router, use the **vrrp ip** command in interface configuration mode. To disable VRRP on the interface and remove the IP address of the virtual router, use the **no** form of this command.

vrrp *group* **ip** *ip-address* **[secondary]**

no vrrp *group* **ip** *ip-address* **[secondary]**

Syntax Description

group	Virtual router group number. The group number range is from 1 to 255.
ip-address	IP address of the virtual router.
secondary	(Optional) Indicates additional IP addresses supported by this group.

Command Default

VRRP is not configured on the interface.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
12.2(31)SG	This command was integrated into Cisco IOS Release 12.2(31)SG.
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The **vrrp ip** command activates VRRP on the configured interface. The first IP address specified in the VRRP configuration is used as the primary address for the virtual router. For VRRP to elect a designated router, at least one router on the cable must have been configured with the primary address of the virtual router. Configuration of the primary address on the master router always overrides a primary address that is currently in use.

VRRP does not support address learning. All addresses must be configured.

All routers in the VRRP group must be configured with the same primary address for the virtual router. If different primary addresses are configured, the routers in the VRRP group will not communicate with each other and any misconfigured routers in the group will change their state to master.

Configure this command once without the **secondary** keyword to indicate the virtual router IP address. If you want to indicate additional IP addresses supported by this group, then do so and include the **secondary** keyword.

Note You can configure the primary IP address of a VRRP group with the same address as the interface. When VRRP is configured in this manner, the router that has the interface IP address is always the master router. Removing the VRRP configuration from a router configured in this way and leaving the IP address of the interface active is considered a misconfiguration because duplicate IP addresses on the LAN will result. If you have configured VRRP in this way and need to remove the VRRP configuration, you can change the interface address to a different value. Alternately, you can also remove all VRRP group members that are using the virtual address equal to the interface address on the router. To avoid a period of duplicate address warnings, deconfigure all VRRP routers in the group. This leaves the address owner router the last to be deconfigured, which avoids duplicate address warnings.

VRRP must be in the master state for proxy Address Resolution Protocol (ARP) to use the VRRP virtual MAC address.

Examples

The following example shows how to enable VRRP on Ethernet interface 0. The VRRP group is 1. IP address 10.0.1.20 is the address of the virtual router.

```
Router(config)# interface ethernet 0
Router(config-if)# ip address 10.0.1.1 255.255.255.0
Router(config-if)# ip address 10.0.2.1 255.255.255.0 secondary
!
Router(config-if)# vrrp 1 ip 10.0.1.20
Router(config-if)# vrrp 1 ip 10.0.2.20 secondary
```

Related Commands

Command	Description
show vrrp	Displays a summary or detailed status of one or all configured VRRP groups.

vrrp name

To link a Virtual Router Redundancy Service (VRRS) client to a Virtual Router Redundancy Protocol (VRRP) group, use the **vrrp name** command in interface configuration mode. To disassociate a VRRS group from VRRS, use the **no** form of this command.

vrrp *group-number* **name** [*vrrp-group-name*]

no vrrp *group-number* **name** [*vrrp-group-name*]

Syntax Description

group-number	Virtual router group number. The group number range is from 1 to 255.
vrrp-group-name	(Optional) VRRP group name.

Command Default

VRRS clients are not linked to VRRP groups.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **vrrp name** command to link VRRS clients to VRRP groups. VRRP provides stateless redundancy for IP routing. VRRP by itself is limited to maintaining its own state. Linking a VRRS client to a VRRP group allows client applications to implement stateful failover. IP redundancy clients are other Cisco IOS processes or applications that use VRRP to provide or withhold a service or resource dependent upon the state of the group.

Use the **no vrrp name** command to dissociates a VRRP group from VRRS. After this, the same VRRP group can be attached to a different VRRP name; or the VRRS name can be applied to a different VRRP group.

Examples

The following example shows how to link VRRS clients to a VRRP group named VRRP-Partition-1:

```
Router(config)# interface gigabitethernet0/0/0
Router(config-if)# vrrp 1 name VRRP-Partition-1
```

Related Commands

Command	Description
vrrs follow	Configures a name association between VRRS plug-ins and the VRRS server.
vrrp name	Links a VRRS client to a VRRP group.

vrrp preempt

To configure the router to take over as master virtual router for a Virtual Router Redundancy Protocol (VRRP) group if it has higher priority than the current master virtual router, use the **vrrp preempt** command in interface configuration mode. To disable this function, use the **no** form of this command.

vrrp *group* **preempt** [**delay minimum** *seconds*]

no vrrp *group* **preempt**

Syntax Description

group	Virtual router group number of the group for which preemption is being configured. The group number is configured with the **vrrp ip** command. The group number range is from 1 to 255.
delay minimum *seconds*	(Optional) Number of seconds that the router will delay before issuing an advertisement claiming master ownership. The default delay is 0 seconds.

Command Default

This command is enabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
12.2(31)SG	This command was integrated into Cisco IOS Release 12.2(31)SG.
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

By default, the router being configured with this command will take over as master virtual router for the group if it has a higher priority than the current master virtual router. You can configure a delay, which will cause the VRRP router to wait the specified number of seconds before issuing an advertisement claiming master ownership.

Note The router that is the IP address owner will preempt, regardless of the setting of this command.

Examples

The following example configures the router to preempt the current master virtual router when its priority of 200 is higher than that of the current master virtual router. If the router preempts the current master virtual router, it waits 15 seconds before issuing an advertisement claiming it is the master virtual router.

```
Router(config-if)# vrrp 1 preempt delay minimum 15
Router(config-if)# vrrp 1 priority 200
```

Related Commands

Command	Description
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.
vrrp priority	Sets the priority level of the router within a VRRP group.

vrrp priority

To set the priority level of the router within a Virtual Router Redundancy Protocol (VRRP) group, use the **vrrp priority** command in interface configuration mode. To remove the priority level of the router, use the **no** form of this command.

vrrp *group* **priority** *level*

no vrrp *group* **priority** *level*

Syntax Description

group	Virtual router group number. The group number range is from 1 to 255.
level	Priority of the router within the VRRP group. The range is from 1 to 254. The default is 100.

Command Default

The priority level is set to the default value of 100.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

Use this command to control which router becomes the master virtual router.

Examples

The following example configures the router with a priority of 254:

```
Router(config-if)# vrrp 1 priority 254
```

Related Commands

Command	Description
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.
vrrp preempt	Configures the router to take over as master virtual router for a VRRP group if it has higher priority than the current master virtual router.

vrrp shutdown

To disable the Virtual Router Redundancy Protocol (VRRP) group on an interface, use the **vrrp shutdown** command in interface configuration mode.

vrrp *group-number* **shutdown**

Syntax Description

group-number	Virtual router group number. The group number range is from 1 to 255.

Command Default

VRRP groups configured by the **vrrp** *group-number* **ip** command are enabled by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(11)T	This command was introduced.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.

Usage Guidelines

When a VRRP group has been configured using the **vrrp** *group-number* **ip** command, the protocol is fully operational. The **vrrp shutdown** command is not displayed on the router, and to disable the protocol for one group, you must explicitly specify the group using the **vrrp shutdown** command.

Examples

The following example shows how to disable one VRRP group on Ethernet interface 0/1 (group 1) while retaining the VRRP group on Ethernet interface 0/2 (group 2):

```
Router(config)# interface ethernet0/1
Router(config-if)# ip address 10.0.1.1 255.255.255.0
Router(config-if)# vrrp 1 ip 10.0.1.254
Router(config-if)# vrrp 1 shutdown
!
Router(config)# interface ethernet0/2
Router(config-if)# ip address 10.0.42.1 255.255.255.0
Router(config-if)# vrrp 2 ip 10.0.42.254
```

Related Commands

Command	Description
show vrrp	Displays a summary or detailed status of one or all configured VRRP groups.

Command	Description
vrrp ip	Enables the VRRP on an interface and identify the IP address of the virtual router.

vrrp sso

To enable Virtual Router Redundancy Protocol (VRRP) support of Stateful Switchover (SSO) if it has been disabled, use the **vrrp sso** command in global configuration mode. To disable VRRP support of SSO, use the **no** form of this command.

vrrp sso

no vrrp sso

Syntax Description

This command has no arguments or keywords.

Command Default

VRRP support of SSO is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SRC	This command was introduced.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.

Usage Guidelines

Use this command to enable VRRP support of SSO if it has been manually disabled by the **no vrrp sso** command.

Examples

The following example shows how to disable VRRP support of SSO:

```
Router(config)# no vrrp sso
```

Related Commands

Command	Description
debug vrrp all	Displays debugging messages for VRRP errors, events, and state transitions.
debug vrrp ha	Displays debugging messages for VRRP high availability.
show vrrp	Displays a brief or detailed status of one or all configured VRRP groups.

vrrp timers advertise

To configure the interval between successive advertisements by the master virtual router in a Virtual Router Redundancy Protocol (VRRP) group, use the **vrrp timers advertise** command in interface configuration mode. To restore the default value, use the **no** form of this command.

vrrp *group* **timers advertise [msec]** *interval*

no vrrp *group* **timers advertise [msec]** *interval*

Syntax Description

group	Virtual router group number. The group number range is from 1 to 255.
msec	(Optional) Changes the unit of the advertisement time from seconds to milliseconds. Without this keyword, the advertisement interval is in seconds.
interval	Time interval between successive advertisements by the master virtual router. The unit of the interval is in seconds, unless the **msec** keyword is specified. The default is 1 second. The valid range is 1 to 255 seconds. When the **msec** keyword is specified, the valid range is 50 to 999 milliseconds.

Command Default

The default interval of 1 second is configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
12.2(31)SG	This command was integrated into Cisco IOS Release 12.2(31)SG.

Release	Modification
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The advertisements being sent by the master virtual router communicate the state and priority of the current master virtual router.

The **vrrp timers advertise** command configures the time between successive advertisement packets and the time before other routers declare the master router to be down. Routers or access servers on which timer values are not configured can learn timer values from the master router. The timers configured on the master router always override any other timer settings. All routers in a VRRP group must use the same timer values. If the same timer values are not set, the routers in the VRRP group will not communicate with each other and any misconfigured router will change its state to master.

Examples

The following example shows how to configure the master virtual router to send advertisements every 4 seconds:

```
Router(config-if)# vrrp 1 timers advertise 4
```

Related Commands

Command	Description
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.
vrrp timers learn	Configures the router, when it is acting as backup virtual router for a VRRP group, to learn the advertisement interval used by the master virtual router.

vrrp timers learn

To configure the router when it is acting as backup virtual router for a Virtual Router Redundancy Protocol (VRRP) group to learn the advertisement interval used by the master virtual router, use the **vrrp timers learn** command in interface configuration mode. To prevent the local router from learning the advertisement interval of the master virtual router, use the **no** form of this command.

vrrp *group* **timers learn**

no vrrp *group* **timers learn**

Syntax Description

group	Virtual router group number to which the command applies. The group number range is from 1 to 255.

Command Default

Disabled; the local router calculates the downtime of the master virtual router based on the advertisement interval of the local router as configured by the **vrrp timers advertise** command.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.0(18)ST	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)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.
12.2(31)SG	This command was integrated into Cisco IOS Release 12.2(31)SG.
12.2(17d)SXB	This command was integrated into Cisco IOS Release 12.2(17d)SXB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

If this command is configured, when the local router is acting as a backup virtual router for the group, it will learn the advertisement interval of the current master virtual router from its master advertisements. The local

router will use that value to calculate how long it should wait before deciding that the master virtual router has gone down. This command synchronizes timers with the current master virtual router.

Examples

The following example configures the router, when it is acting as backup virtual router, to learn the advertisement interval from the advertisements of the current master virtual router:

```
Router(config-if)# vrrp 1 timers learn
```

Related Commands

Command	Description
vrrp ip	Enables VRRP and identifies the IP address of the virtual router.
vrrp timers advertise	Configures the interval between successive advertisements by the master virtual router in a VRRP group.

vrrp track

To configure Virtual Router Redundancy Protocol (VRRP) to track an object, use the **vrrp track** command in interface configuration mode. To disable the tracking, use the **no** form of this command.

vrrp *group* **track** *object-number* [**decrement** *priority*]

no vrrp *group* **track** *object-number* [**decrement** *priority*]

Syntax Description

group	Group number to which the tracking applies. The group number range is from 1 to 255.
object-number	Object number in the range from 1 to 500 representing the object to be tracked.
decrement *priority*	(Optional) Amount by which the priority for the router is decremented (or incremented) when the tracked object goes down (or comes back up). The default value is 10. Decrements can be set to any value between 1 and 255.

Command Default

The default decrement value is 10. The range is from 1 and 255.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(2)T	This command was introduced.
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.
12.2SX	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

You can configure VRRP to track specific objects, such as an interface or IP route, that can alter the priority level of a virtual router for a VRRP group. The tracked objects are first defined using the **track interface** or **track ip route** global configuration command. The client process, in this case VRRP, registers interest in tracking these 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 IP routing capability of serial interface 1/0. VRRP 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, then the priority of the VRRP group is reduced by 10.

If both serial interfaces are operational, then Router A will be the master virtual router because it has the higher priority.

However, if IP routing on serial interface 1/0 in Router A fails, then the HSRP group priority will be reduced and Router B will take over as the master virtual router, thus maintaining a default virtual gateway service to hosts on the 10.1.0.0 subnet.

Examples

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

Examples

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

Related Commands

Command	Description
track interface	Configures an interface to be tracked.
track ip route	Tracks the state of an IP route.

vrrs

To specify a distinct AAA accounting method list to use, a non-zero delay time for accounting-off messages, and additional attributes other than the default for a Virtual Router Redundancy Protocol (VRRP) group, enter the **vrrs** command in the global configuration mode. To return to the default values, use the **no** form of this command.

vrrs *vrrs-group-name*

no vrrs *name*

Syntax Description

vrrs-group-name	Name of a VRRS group.

Command Default

Accounting-on and accounting-off messages for a VRRP group are set with default accounting attributes, without any delay for accounting-off messages, and using the VRRS default accounting method list.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

The VRRS group name specified by the *vrrs-group-name* argument should match a VRRP group as configured by the **vrrp name** command in interface configuration mode.

Note VRRS does not perform a cross-check of the VRRS group name between the **vrrs** global configuration command and the **vrrp name** interface configuration command. Any string entered is accepted.

The following RADIUS attributes are included in accounting messages by default:

- Attribute 4, NAS-IP-Address
- Attribute 26, Cisco VSA Type 1, vrrs
- Attribute 40, Acct-Status-Type
- Attribute 41, Acct-Delay-Type
- Attribute 44 Acct-Session-Id

Examples

The following example shows how to configure a VRRS group named vrrp-group-1:

```
Router(config)# vrrs vrrp-group-1
Router(config-vrrs)# exit
Router(config)# interface gigabitethernet 1/0/0
Router(config-if)# ip address 10.1.0.2 255.0.0.0
Router(config-if)# vrrp 1 ip 10.1.0.10
Router(config-if)# vrrp 1 name vrrp-group-1
```

Related Commands

Command	Description
vrrp ip	Enables the VRRP on an interface and identifies the IP address of the virtual router.
vrrp name	Links a VRRS client to a VRRP group.

vrrs follow

To configure a name association between Virtual Router Redundancy Service (VRRS) plug-ins and the VRRS server, use the **vrrs follow** command in subinterface configuration mode. To disassociate the VRRS plug-ins from a server, use the **no** form of this command.

vrrs follow *name*

no vrrs follow *name*

Syntax Description

name	A name that associates the VRRS plug-ins with a First Hop Redundancy Protocol (FHRP) server, via VRRS, that shares the same name.

Command Default

VRRS plug-ins remain detached and in the DOWN state.

Command Modes

Subinterface configuration (config-subif)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

This command can be applied only to subinterfaces.

The **no vrrs follow** command disassociate the VRRS plug-ins from a server. The VRRS plug-ins are disabled after this, and are forced to the DOWN state until they are reattached to a new name.

Examples

The following example configures a name association between the VRRS interface-state and mac-address plug-ins and the VRRS server:

```
Router(config)# interface gigabitethernet0/0/0.1
Router(config-subif)# ip address 172.24.1.1 255.255.255.0
Router(config-subif)# vrrs follow name1
Router(config-subif)# vrrs interface-state
Router(config-subif)# vrrs mac-address
```

Related Commands

Command	Description
vrrs interface-state	Configures the VRRP shutdown plug-in on an interface.

Command	Description
vrrs mac-address	Configures the VRRS mac-address plug-in on an interface.

vrrs interface-state

To configure the Virtual Router Redundancy Protocol (VRRP) shutdown plug-in on an interface, use the **vrrs interface-state** command in subinterface configuration mode. To disable the shutdown plug-in, use the **no** form of this command.

vrrs interface-state

no vrrs interface-state

Syntax Description

This command has no arguments or keywords.

Command Default

The VRRS shutdown plug-in remains detached and in the DOWN state.

Command Modes

Subinterface configuration (config-subif)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **vrrs interface-state** command to configure the VRRP shutdown plug-in on an interface. When the line protocol is configured, and the Virtual Router Redundancy Service (VRRS) is in a nonactive state, the line protocol state of the interface is transitioned to down.

The **vrrs follow** command associates the interface-state plug-in with a First Hop Redundancy Protocol (FHRP) that is using the same name with VRRS. Removal of the **vrrs interface-state** command, or a change in the VRRS state to an active state, causes the line protocol state of the interface to transition to UP.

Examples

The following example shows how to configure the VRRP shutdown plug-in on an interface:

```
Router(config)# interface gigabitethernet0/0/1.1
Router(config-subif)# ip address 10.0.0.0 255.255.255.0
Router(config-subif)# vrrs follow vrrp-partition-1
Router(config-subif)# vrrs interface-state
Router(config-subif)# vrrs mac-address arp interval 5 duration 60
```

Related Commands

Command	Description
vrrs follow	Configures a name association between VRRS plug-ins and the VRRS server.
vrrs mac-address	Configures the VRRS mac-address plug-in on an interface.

vrrs mac-address

To configure the Virtual Router Redundancy Service (VRRS) mac-address plug-in on an interface, use the **vrrs mac-address** command in subinterface configuration mode. To disable the mac-address plug-in, use the **no** form of this command.

vrrs mac-address [**arp** [**interval** *seconds*] [**duration** *seconds*]]

no vrrs mac-address [**arp** [**interval** *seconds*] [**duration** *seconds*]]

Syntax Description

arp	(Optional) Enables sending gratuitous ARP messages.
interval *seconds*	(Optional) Specifies, the interval, in seconds, at which gratuitous ARPs are sent by the VRRS mac-address plug-in.
duration *seconds*	(Optional) Specifies, in seconds, how long the gratuitous ARP repeats continue. A value of 0 means indefinitely, but use of this option should be carefully considered because it may have a detrimental effect on the performance of the router or network.

Command Default

The VRRS mac-address plug-in remains detached and in the DOWN state.

Command Modes

Subinterface configuration (config-subif)

Command History

Release	Modification
Cisco IOS XE Release 2.6	This command was introduced.

Usage Guidelines

Use the **vrrs mac-address** command to configure the VRRS mac-address plug-in on an interface. When a virtual-MAC is configured, and VRRS is in an ACTIVE state, a virtual-MAC is added to the interface that is to be associated with the Primary IP address configured on that interface. Use the **vrrs follow** command to associate the mac-address plug-in with a First Hop Redundancy Protocol (FHRP) that is using the same name as VRRS. The mac-address plug-in can be enabled with all defaults by configuring the **vrrs mac-address** command with no optional keywords or arguments.

Examples

The following example shows how to configure the VRRS mac-address plug-in on an interface:

```
Router(config)# interface gigabitethernet0/0/1.1
Router(config-subif)# ip address 10.0.0.0 255.255.255.0
```

```
Router(config-subif)# vrrs follow vrrp-partition-1
Router(config-subif)# vrrs interface-state
Router(config-subif)# vrrs mac-address arp interval 5 duration 60
```

Related Commands

Command	Description
vrrs follow	Configures a name association between VRRS plug-ins and the VRRS server.
vrrs interface-state	Configures the VRRP shutdown plug-in on an interface.