Gateway Load Balancing Protocol

Feature History

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

This document describes the Gateway Load Balancing Protocol feature in Cisco IOS Release 12.2(14)S and it includes the following sections:

Feature Overview

The Gateway Load Balancing Protocol feature provides automatic router backup for IP hosts configured with a single default gateway on an IEEE 802.3 LAN. Multiple first hop routers on the LAN combine to offer a single virtual first hop IP router while sharing the IP packet forwarding load. Other routers on the LAN may act as redundant Gateway Load Balancing Protocol (GLBP) routers that will become active if any of the existing forwarding routers fail.

GLBP performs a similar, but not identical, function for the user as the Hot Standby Router Protocol (HSRP) and the Virtual Router Redundancy Protocol (VRRP). HSRP and VRRP protocols allow multiple routers to participate in a virtual router group configured with a virtual IP address. One member is elected to be the active router to forward packets sent to the virtual IP address for the group. The other routers in the group are redundant until the active router fails. These standby routers have unused bandwidth that the protocol is not using. Although multiple virtual router groups can be configured for the same set of routers, the hosts must be configured for different default gateways, which results in an extra administrative burden. GLBP provides load balancing over multiple routers (gateways) using a single virtual IP address and multiple virtual MAC addresses. Each host is configured with the same

virtual IP address, and all routers in the virtual router group participate in forwarding packets. GLBP members communicate between each other through hello messages sent every 3 seconds to the multicast address 224.0.0.102, User Datagram Protocol (UDP) port 3222 (source and destination).

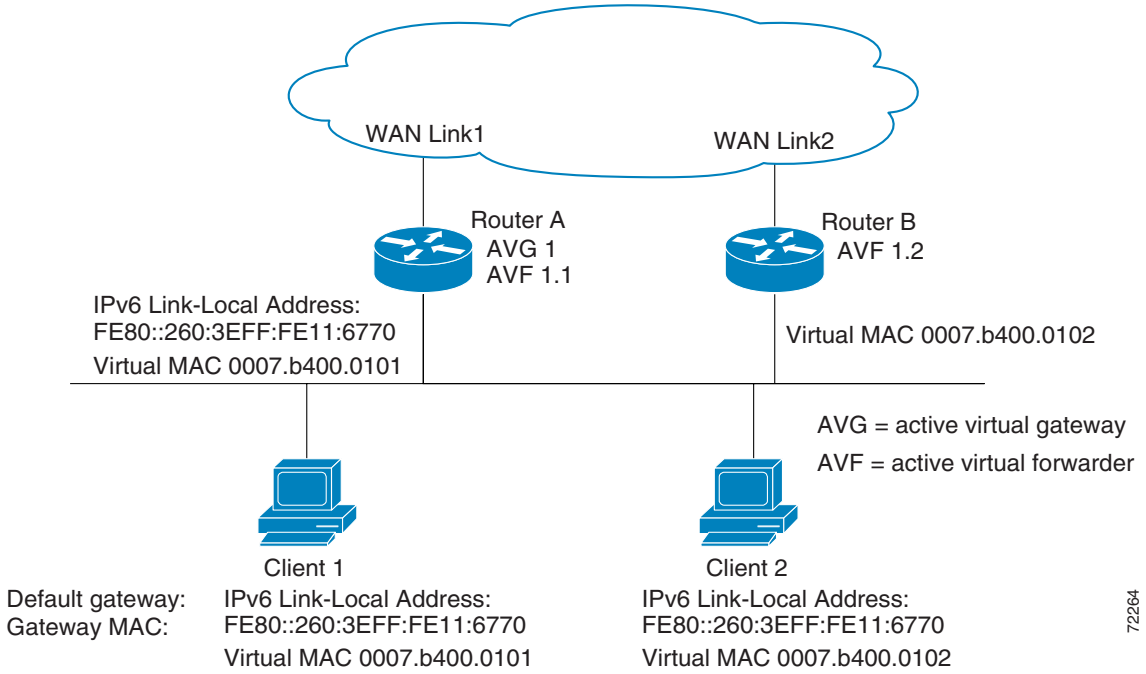
GLBP Active Virtual Gateway

Members of a GLBP group elect one gateway to be the active virtual gateway (AVG) for that group. Other group members provide backup for the AVG in the event that the AVG becomes unavailable. The AVG assigns a virtual MAC address to each member of the GLBP group. Each gateway assumes responsibility for forwarding packets sent to the virtual MAC address assigned to it by the AVG. These gateways are known as active virtual forwarders (AVFs) for their virtual MAC address.

The AVG is responsible for answering Address Resolution Protocol (ARP) requests for the virtual IP address. Load sharing is achieved by the AVG replying to the ARP requests with different virtual MAC addresses.

In Figure 1, Router A is the AVG for a GLBP group, and is responsible for the virtual IP address 10.21.8.10. Router A is also an AVF for the virtual MAC address 0007.b400.0101. Router B is a member of the same GLBP group and is designated as the AVF for the virtual MAC address 0007.b400.0102. Client 1 has a default gateway IP address of 10.21.8.10 and a gateway MAC address of 0007.b400.0101. Client 2 shares the same default gateway IP address but receives the gateway MAC address 0007.b400.0102 as Router B is sharing the traffic load with Router A.

Figure 1 GLBP Topology



If Router A becomes unavailable, Client 1 will not lose access to the WAN because Router B will assume responsibility for forwarding packets sent to the virtual MAC address of Router A, and for responding to packets sent to its own virtual MAC address. Router B will also assume the role of the AVG for the entire GLBP group. Communication for the GLBP members continues despite the failure of a router in the GLBP group.

GLBP Virtual MAC Address Assignment

A GLBP group allows up to four virtual MAC addresses per group. The AVG is responsible for assigning the virtual MAC addresses to each member of the group. Other group members request a virtual MAC address after they discover the AVG through hello messages. Gateways are assigned the next MAC address in sequence. A virtual forwarder that is assigned a virtual MAC address by the AVG is known as a primary virtual forwarder. Other members of the GLBP group learn the virtual MAC addresses from hello messages. A virtual forwarder that has learned the virtual MAC address is referred to as a secondary virtual forwarder.

GLBP Virtual Gateway Redundancy

GLBP operates virtual gateway redundancy in the same way as HSRP. One gateway is elected as the AVG, another gateway is elected as the standby virtual gateway, and the remaining gateways are placed in a listen state.

If an AVG fails, the standby virtual gateway will assume responsibility for the virtual IP address. A new standby virtual gateway is then elected from the gateways in the listen state.

GLBP Virtual Forwarder Redundancy

Virtual forwarder redundancy is similar to virtual gateway redundancy with an AVF. If the AVF fails, one of the secondary virtual forwarders in the listen state assumes responsibility for the virtual MAC address.

The new AVF is also a primary virtual forwarder for a different forwarder number. GLBP migrates hosts away from the old forwarder number using two timers that start as soon as the gateway changes to the active virtual forwarder state. GLBP uses the hello messages to communicate the current state of the timers.

The redirect time is the interval during which the AVG continues to redirect hosts to the old virtual forwarder MAC address. When the redirect time expires, the AVG stops redirecting hosts to the virtual forwarder, although the virtual forwarder will continue to forward packets that were sent to the old virtual forwarder MAC address.

The secondary holdtime is the interval during which the virtual forwarder is valid. When the secondary holdtime expires, the virtual forwarder is removed from all gateways in the GLBP group. The expired virtual forwarder number becomes eligible for reassignment by the AVG.

GLBP Gateway Priority

GLBP gateway priority determines the role that each GLBP gateway plays and what happens if the AVG fails.

Priority also determines if a GLBP router functions as a backup virtual gateway and the order of ascendancy to becoming an AVG if the current AVG fails. You can configure the priority of each backup virtual gateway with a value of 1 through 255 using the **glbp priority** command.

In Figure 1, if Router A, the AVG in a LAN topology, fails, an election process takes place to determine which backup virtual gateway should take over. In this example, Router B is the only other member in the group so it will automatically become the new AVG. If another router existed in the same GLBP

group with a higher priority, then the router with the highest priority would be elected. If both routers have the same priority, the backup virtual gateway with the higher IP address would be elected to become the active virtual gateway.

By default, the GLBP gateway preemptive scheme is disabled. A backup virtual gateway can become the AVG only if the current AVG fails, regardless of the priorities assigned to the virtual gateways. You can enable the GLBP preemptive scheme using the **glbp preempt** command. Preemption allows a backup virtual gateway to become the AVG, if the backup virtual gateway is assigned a higher priority than the current AVG.

GLBP Gateway Weighting and Tracking

GLBP uses a weighting scheme to determine the forwarding capacity of each router in the GLBP group. The weighting assigned to a router in the GLBP group determines whether it will forward packets and, if so, the proportion of hosts in the LAN for which it will forward packets. Thresholds can be set to disable forwarding when the weighting falls below a certain value, and when it rises above another threshold, forwarding is automatically reenabled.

The GLBP group weighting can be automatically adjusted by tracking the state of an interface within the router. If a tracked interface goes down, the GLBP group weighting is reduced by a specified value. Different interfaces can be tracked to decrement the GLBP weighting by varying amounts.

Benefits

Load Sharing

You can configure GLBP in such a way that traffic from LAN clients can be shared by multiple routers, thereby sharing the traffic load more equitably among available routers.

Multiple Virtual Routers

GLBP supports up to 1024 virtual routers (GLBP groups) on each physical interface of a router, and up to four virtual forwarders per group.

Preemption

The redundancy scheme of GLBP enables you to preempt an active virtual gateway with a higher priority backup virtual gateway that has become available. Forwarder preemption works in a similar way, except that forwarder preemption uses weighting instead of priority and is enabled by default.

Authentication

You can use a simple text password authentication scheme between GLBP group members to detect configuration errors. A router within a GLBP group with a different authentication string than other routers will be ignored by other group members.

Related Features and Technologies

The GLBP feature is similar to both the HSRP and the VRRP features that exist in the Cisco IOS software.

The HSRP feature is documented in the “Configuring IP Services” chapter of the *Cisco IOS IP Configuration Guide* and in the *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services*.

The VRRP feature is documented in the Cisco IOS Release 12.0(18)ST.

Related Documents

For related information on this feature, refer to the following documents:

- *Cisco IOS IP Configuration Guide*, Release 12.2
- *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services*, Release 12.2

Supported Platforms

- Cisco 7200 series
- Cisco 7400 series
- Cisco 7500 series

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Cisco IOS software is packaged in feature sets that are supported on specific platforms. To get updated information regarding platform support for this feature, access Cisco Feature Navigator. Cisco Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

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Platform support for particular Cisco IOS software releases is dependent on the availability of the software images for those platforms. Software images for some platforms may be deferred, delayed, or changed without prior notice. For updated information about platform support and availability of software images for each Cisco IOS software release, refer to the online release notes or, if supported, Cisco Feature Navigator.

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

None

Prerequisites

Before configuring the GLBP feature, ensure that the routers can support multiple MAC addresses on the physical interfaces. For each GLBP forwarder to be configured, an additional MAC address is used.

Configuration Tasks

See the following sections for configuration tasks for GLBP. Each task in the list is identified as either required or optional.

- Customizing GLBP (optional)
- Configuring GLBP Weighting (optional)
- Enabling GLBP (required)
- Verifying GLBP (optional)

Customizing GLBP

Customizing the behavior of GLBP is optional. Be aware that as soon as you enable a GLBP group, that group is operating. It is possible that if you first enable a GLBP group before customizing GLBP, the router could take over control of the group and become the AVG before you have finished customizing the feature. Therefore, if you plan to customize GLBP, it is a good idea to do so before enabling GLBP.

To customize your GLBP configuration, use one or more of the GLBP commands in interface configuration mode (Table 1), as needed.

Table 1 Configuring GLBP in Interface Configuration Mode

Command	Purpose
`Router(config-if)# glbp group authentication text string`	Authenticates GLBP packets received from other routers in the group. If you configure authentication, all routers within the GLBP group must use the same authentication string.
`Router(config-if)# glbp group forwarder preempt [delay minimum seconds]`	Configures the router to take over as AVF for a GLBP group if it has a higher priority than the current AVF. This command is enabled by default with a delay of 30 seconds. Use the optional **delay** and **minimum** keywords and the *seconds* argument to specify a minimum delay interval in seconds before preemption of the AVF takes place.
`Router(config-if)# glbp group load-balancing {host-dependent | round-robin | weighted}`	Specifies the method of load balancing used by the GLBP AVG.
`Router(config-if)# glbp group preempt [delay minimum seconds]`	Configures the router to take over as AVG for a GLBP group if it has a higher priority than the current AVG. This command is disabled by default. Use the optional **delay** and **minimum** keywords and the *seconds* argument to specify a minimum delay interval in seconds before preemption of the AVG takes place.
`Router(config-if)# glbp group priority level`	Sets the priority level of the gateway within a GLBP group. The default value is 100.
`Router(config-if)# glbp group timers [msec] hellotime [msec] holdtime`	Configures the interval between successive hello packets sent by the AVG in a GLBP group. The *holdtime* argument specifies the interval in seconds before the virtual gateway and virtual forwarder information in the hello packet is considered invalid. The optional **msec** keyword specifies that the following argument will be expressed in milliseconds, instead of the default seconds.
`Router(config-if)# glbp group timers redirect redirect timeout`	Configures the time interval during which the AVG continues to redirect clients to an AVF. The *timeout* argument specifies the interval in seconds before a secondary virtual forwarder becomes invalid. **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.

Configuring GLBP Weighting

GLBP weighting is used to determine whether a router can act as a virtual forwarder. Initial weighting values can be set and optional thresholds specified. Interface states can be tracked and a decrement value set to reduce the weighting value if the interface goes down. When the GLBP router weighting drops below a specified value, the router will no longer be an active virtual forwarder. When the weighting rises above a specified value, the router can resume its role as an active virtual forwarder.

To configure GLBP weighting values and object tracking, use the commands listed in Table 2 beginning in global configuration mode.

Table 2 Configuring GLBP Weighting and Object Tracking

	Command	Purpose
Step 1	`Router(config)# track object-number interface type number {line-protocol | ip routing}`	Configures an interface to be tracked where changes in the state of the interface affect the weighting of a GLBP gateway. This command configures the interface and corresponding object number to be used with the **glbp weighting track** command. The **line-protocol** keyword tracks whether the interface is up. The **ip routing** keywords also check that IP routing is enabled on the interface, and an IP address is configured.
Step 2	`Router(config)# interface type number`	Enters interface configuration mode.
Step 3	`Router(config-if)# glbp group weighting maximum [lower lower] [upper upper]`	Specifies the initial weighting value, and the upper and lower thresholds, for a GLBP gateway.
Step 4	`Router(config-if)# glbp group weighting track object-number [decrement value]`	Specifies an object to be tracked that affects the weighting of a GLBP gateway. The *value* argument specifies a reduction in the weighting of a GLBP gateway when a tracked object fails.

Enabling GLBP

GLBP is designed to be easy to configure. Each gateway in a GLBP group must be configured with the same group number, and at least one gateway in the GLBP group must be configured with the virtual IP address to be used by the group. All other parameters can be learned.

If VLANs are in use on an interface, the GLBP group number must be different for each VLAN.

To enable GLBP on an interface, use the commands in Table 3 beginning in global configuration mode.

Table 3 Enabling GLBP on an Interface

	Command	Purpose
Step 1	`Router(config)# interface type number`	Enters interface configuration mode.
Step 2	`Router(config-if)# glbp group ip [ip-address [secondary]]`	Enables GLBP on an interface and identifies the primary IP address of the virtual gateway. After you identify a primary IP address, you can use the **glbp** *group* **ip** command again with the **secondary** keyword to indicate additional IP addresses supported by this group.

Verifying GLBP

Verifying that GLBP is working involves checking the status of a GLBP group on the router using the **show glbp** EXEC command.

To verify that the Gateway Load Balancing Protocol feature is running, perform the following steps:

Step 1 Enter the **show glbp** EXEC command to display the status of the specified group on the router.

```
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 1800 sec, forwarder time-out 28800 sec
  Authentication text "stringabc"
  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
```

Troubleshooting Tips

The Gateway Load Balancing Protocol feature introduces five new EXEC mode commands, **debug condition glbp**, **debug glbp errors**, **debug glbp events**, **debug glbp packets**, and **debug glbp terse**, to enable diagnostic output concerning various events relating to the operation of GLBP to be displayed on a console. The **debug condition glbp**, **debug glbp errors**, **debug glbp events**, **debug glbp packets**, and **debug glbp terse** commands are intended only for troubleshooting purposes because the volume of output generated by the software can result in severe performance degradation on the router. To minimize the impact of using the commands, perform the following steps:

Step 1 Attach a console directly to the router running GLBP.

Step 2 Enter the **no logging console** command in global configuration mode to disable all logging to the console terminal. To reenable logging to the console, use the **logging console** command in global configuration mode.

Step 3 Use Telnet to access a router port. Enter the **enable** command in EXEC configuration mode.

Step 4 Enter the **terminal monitor** command in global configuration mode and enter the necessary **debug condition glbp**, **debug glbp errors**, **debug glbp events**, **debug glbp packets**, or **debug glbp terse** commands. Try to enter only specific keywords to isolate the output to a certain subcomponent and minimize the load on the processor. To disable logging on the virtual terminal, enter the **no terminal monitor** command.

Step 5 Enter the specific **no** form of the command when you are finished.

This procedure will minimize the load on the router created by the **debug condition glbp**, **debug glbp errors**, **debug glbp events**, **debug glbp packets**, or **debug glbp terse** command because the console port is no longer generating character-by-character processor interrupts. If you cannot connect to a console directly, you can run this procedure via a terminal server. If you must break the Telnet connection, however, you may not be able to reconnect because the router may be unable to respond due to the processor load of generating the debugging output.

Monitoring and Maintaining GLBP

To monitor and maintain the Gateway Load Balancing Protocol feature, use the following command in EXEC mode, as needed.

Command	Purpose
`Router# show glbp [type number] [group] [group-state] [brief]`	Displays the status of the specified GLBP group.

Configuration Examples

This section provides the following configuration examples:

- Customizing GLBP Configuration Example
- Configuring GLBP Weighting Example
- Enabling GLBP Configuration Example

Customizing GLBP Configuration Example

In the following example, Router A, shown in Figure 1, is configured with a number of GLBP commands:

```
interface FastEthernet0/0
 ip address 10.21.8.32 255.255.255.0
 glbp 10 authentication text stringxyz
 glbp 10 forwarder preempt delay minimum 60
 glbp 10 load-balancing host-dependent
 glbp 10 preempt delay minimum 60
 glbp 10 priority 254
 glbp 10 timers 5 18
 glbp 10 timers redirect 1800 28800
```

Configuring GLBP Weighting Example

In the following example, Router A, shown in Figure 1, is configured to track the IP routing state of the POS interface 6/0, an initial GLBP weighting with upper and lower thresholds is set, and a weighting decrement value of 5 is set. If POS interface 6/0 goes down, the weighting value of the router is reduced.

```
track 2 interface POS6/0 ip routing
interface FastEthernet0/0
 glbp 10 weighting 110 lower 95 upper 105
 glbp 10 weighting track 2 decrement 5
```

Enabling GLBP Configuration Example

In the following example, Router A, shown in Figure 1, is configured to enable GLBP, and the virtual IP address of 10.21.8.10 is specified for GLBP group 10:

```
interface FastEthernet0/0
 ip address 10.21.8.32 255.255.255.0
 glbp 10 ip 10.21.8.10
```

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- **debug condition glbp**
- **debug glbp errors**
- **debug glbp events**
- **debug glbp packets**
- **debug glbp terse**
- **glbp authentication**
- **glbp forwarder preempt**
- **glbp ip**
- **glbp load-balancing**
- **glbp preempt**
- **glbp priority**
- **glbp timers**
- **glbp timers redirect**
- **glbp weighting**
- **glbp weighting track**
- **show glbp**
- **track**

debug condition glbp

To display debugging messages about Gateway Load Balancing Protocol (GLBP) conditions, use the **debug condition glbp** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug condition glbp *type number group* [*forwarder*]

no debug condition glbp *type number group* [*forwarder*]

Syntax Description

type number	Interface type and number for which output is displayed.
group	GLBP group number in the range from 0 to 1023.
forwarder	(Optional) Number in the range from 1 to 255 used to identify a virtual MAC address.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **debug condition glbp** command:

```
Router# debug condition glbp FastEthernet 0/0 10 1

Condition 1 set
5d23h: Fa0/0 GLBP10.1 Debug: Condition 1, glbp Fa0/0 GLBP10.1 triggered, count 1
```

Related Commands

Command	Description
debug glbp errors	Displays debugging messages about GLBP errors.
debug glbp events	Displays debugging messages about GLBP events.
debug glbp packets	Displays debugging messages about GLBP packets.
debug glbp terse	Displays a limited range of debugging messages about GLBP errors, events, and packets.

debug glbp errors

To display debugging messages about Gateway Load Balancing Protocol (GLBP) error conditions, use the **debug glbp errors** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug glbp errors

no debug glbp errors

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **debug glbp errors** command:

```
Router# debug glbp errors

GLBP Errors debugging is on
1d19h: GLBP: Fa0/0 API active virtual address 10.21.8.32 not found
1d19h: GLBP: Fa0/0 API active virtual address 10.21.8.32 not found
1d19h: GLBP: Fa0/0 API active virtual address 10.21.8.32 not found
```

Related Commands

Command	Description
debug condition glbp	Displays debugging messages about GLBP which match specific conditions.

debug glbp events

To display debugging messages about Gateway Load Balancing Protocol (GLBP) events that are occurring, use the **debug glbp events** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug glbp events [**all** | **detail** | **terse**]

no debug glbp events [**all** | **detail** | **terse**]

Syntax Description

all	(Optional) Displays all debugging output about GLBP events.
detail	(Optional) Displays detailed debugging output about GLBP events.
terse	(Optional) Displays a limited range of debugging output about GLBP events.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **debug glbp events** command when the **terse** keyword is specified:

```
Router# debug glbp events terse

GLBP Events debugging is on
    (protocol, redundancy, track)
```

Related Commands

Command	Description
debug condition glbp	Displays debugging messages about GLBP which match specific conditions.

debug glbp packets

To display summary information about Gateway Load Balancing Protocol (GLBP) packets being sent or received, use the **debug glbp packets** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug glbp packets [**all** | **detail** | **hello** | **reply** | **request** | **terse**]

no debug glbp packets [**all** | **detail** | **hello** | **reply** | **request** | **terse**]

Syntax Description

all	(Optional) Displays all debugging output about GLBP packets.
detail	(Optional) Displays detailed debugging output about GLBP packets.
hello	(Optional) Displays debugging output about GLBP hello packets.
reply	(Optional) Displays debugging output about GLBP reply packets.
request	(Optional) Displays debugging output about GLBP request packets.
terse	(Optional) Displays a limited range of debugging output about GLBP packets.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **debug glbp packets** command:

```
Router# debug glbp packets hello

GLBP Packets debugging is on
    (Hello)
1d19h: GLBP: Fa0/0 Grp 10 Hello  out 10.21.8.32 VG Active  pri 254 vIP 10.21.8.10 1
1d19h: GLBP: Fa0/0 Grp 10 Hello  out 10.21.8.32 VG Active  pri 254 vIP 10.21.8.10 1
1d19h: GLBP: Fa0/0 Grp 10 Hello  out 10.21.8.32 VG Active  pri 254 vIP 10.21.8.10 1
1d19h: GLBP: Fa0/0 Grp 10 Hello  out 10.21.8.32 VG Active  pri 254 vIP 10.21.8.10 1
```

Related Commands

Command	Description
debug condition glbp	Displays debugging messages about GLBP which match specific conditions.

debug glbp terse

To display a limited range of debug messages about Gateway Load Balancing Protocol (GLBP) errors, events and packets, use the **debug glbp terse** command in privileged EXEC mode. To disable debugging output, use the **no** form of this command.

debug glbp terse

no debug glbp terse

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **debug glbp terse** command:

```
Router# debug glbp terse

GLBP:
  GLBP Errors debugging is on
  GLBP Events debugging is on
    (protocol, redundancy, track)
  GLBP Packets debugging is on
    (Request, Reply)
```

Related Commands

Command	Description
debug condition glbp	Displays debugging messages about GLBP which match specific conditions.
debug glbp errors	Displays debugging messages about GLBP errors.
debug glbp events	Displays debugging messages about GLBP events.
debug glbp packets	Displays debugging messages about GLBP packets.

glbp authentication

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

glbp *group* **authentication text** *string*

no glbp *group* **authentication text** *string*

Syntax Description

group	GLBP group number in the range from 0 to 1023.
text *string*	Authentication string. The number of characters in the command plus the text string must not exceed 255 characters.

Defaults

No authentication of GLBP messages occurs.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

The authentication string is sent in plain text in all GLBP messages. The same authentication string 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 string.

Examples

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

```
interface FastEthernet 0/0
 glbp 10 authentication text stringxyz
```

Related Commands

Command	Description
glbp ip	Enables GLBP.

glbp forwarder preempt

To configure a router to take over as active virtual forwarder (AVF) for a Gateway Load Balancing Protocol (GLBP) group if it has higher priority than the current AVF, use the **glbp forwarder preempt** command in interface configuration mode. To disable this feature, 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) 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.

Defaults

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

Command Modes

Interface configuration

Command History

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

Usage Guidelines

Use the **glbp forwarder preempt** command to allow a virtual gateway in the specified GLBP group to take over as AVF for the group if it has a higher priority than the current AVF. You can configure a delay, which will cause the GLBP gateway to wait the specified number of seconds before taking over the role of AVF.

Examples

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

```
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.

Defaults

GLBP is disabled by default.

Command Modes

Interface configuration

Command History

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

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 currently 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.

```
interface FastEthernet0/0
 ip address 10.21.8.32 255.255.255.0
 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.

```
interface FastEthernet 0/0
 glbp 10 ip
```

Related Commands

Command	Description
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) 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) 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) Load balancing method that is dependent on the weighting value advertised by the gateway.

Defaults

The round-robin method is the default.

Command Modes

Interface configuration

Command History

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

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:

```
interface FastEthernet 0/0
 glbp 10 ip 10.21.8.10
 glbp 10 load-balancing host-dependent
```

Related Commands

Command	Description
show glbp	Displays the GLBP information.

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 feature, 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) 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.

Defaults

A GLBP router with a higher priority than the current AVG cannot assume the role of AVG.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

Use the **glbp preempt** command to allow a virtual gateway in the specified GLBP group to take over as AVG for the group if it has a higher priority than the current active virtual gateway. You can configure a delay, which will cause the GLBP gateway to wait the specified number of seconds before taking over the role of AVG.

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.

```
glbp 10 preempt delay minimum 60
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.

Defaults

level: 100

Command Modes

Interface configuration

Command History

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

Usage Guidelines

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

Examples

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

```
glbp 10 priority 254
```

Related Commands

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

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.
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).

Defaults

hellotime: 3 seconds.
holdtime: 10 seconds.

Command Modes

Interface configuration

Command History

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

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:

```
interface FastEthernet 0/0
 glbp 10 ip
 glbp 10 timers 5 18
```

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).

Defaults

redirect: 600 seconds (10 minutes)
timeout: 14,400 seconds (4 hours)

Command Modes

Interface configuration (config-if)

Command History

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

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 that the forwarder was responsible for replying to 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 that the forwarder was responsible for 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) Lower weighting value in the range from 1 to the specified maximum weighting value. Default value is 1.
upper *upper*	(Optional) Upper weighting value in the range from the lower weighting to the maximum weighting value. The default value is the specified maximum weighting value.

Defaults

The default gateway weighting value is 100.

Command Modes

Interface configuration

Command History

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

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:

```
interface FastEthernet 0/0
 ip address 10.21.8.32 255.255.255.0
 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 where changes in the state of the interface affect the weighting of a GLBP gateway.

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. Use the **track** command to configure the tracked object.
decrement *value*	(Optional) 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.

Defaults

The default decrement value is 10.

Command Modes

Interface configuration

Command History

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

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.

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.

```
interface FastEthernet 0/0
 ip address 10.21.8.32 255.255.255.0
 glbp 10 weighting track 1
 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 where changes in the state of the interface affect the weighting of a GLBP gateway.

show glbp

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

show glbp [*type number*] [*group*] [*state*] [**brief**]

Syntax Description

type number	(Optional) Interface type and number for which output is displayed.
group	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**, **speak**, or **standby**.
brief	(Optional) A single line of output summarizes each virtual gateway or virtual forwarder.

Command Modes

Privileged EXEC

Command History

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

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.

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 1800 sec, forwarder time-out 28800 sec
  Authentication text "stringabc"
  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           -
```

Table 4 describes the significant fields shown in the displays.

Table 4 show glbp Field Descriptions

Field	Description
FastEthernet - Group	Interface type and number and GLBP group number for the interface.
State is ...	State descriptions for virtual gateways or virtual forwarders are similar but differ in some details. For a virtual gateway the state can be one of the following: • Disabled—Indicates that the virtual IP address has not been configured or learned yet, but other 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—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—Virtual gateway is attempting to become the active or standby virtual gateway. • Standby—Indicates that the gateway is next in line to be the active virtual gateway (AVG). • Active—Indicates that this gateway is the AVG, and that it is responsible for responding to Address Resolution Protocol (ARP) requests for the virtual IP address. For a virtual forwarder the state can be one of the following: • Disabled—Indicates that 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—Virtual forwarder is receiving hello packets and is ready to change to the “active” state if the active virtual forwarder (AVF) becomes unavailable. • Active—Indicates that this gateway is the AVF, and that it is responsible for forwarding packets sent to the virtual forwarder MAC address.
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.

Table 4 show glbp Field Descriptions (continued)

Field	Description
Hello time, hold time	The hello time is the time between hello packets (in seconds or milliseconds). The holdtime is the time (in seconds) before other routers declare the active router to be down. All routers in a GLBP group use the hello and holdtime values of the current AVG. If the locally configured values are different, the configured values appear in parentheses after the hello time and holdtime values.
Next hello sent in ...	Time until GLBP will send the next hello packet (in seconds or milliseconds).
Preemption enabled	Indicates whether GLBP gateway 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. This field is also displayed under the forwarder section where it indicates GLBP forwarder preemption.
Active is ...	Value can be “local,” “unknown,” or an IP address. Address (and the expiration date of 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 ...	Value can be “local,” “unknown,” or an IP address. Address (and the expiration date of the address) of the standby gateway (the gateway that is next in line to be the AVG).
Weighting	Initial weighting value with lower and upper threshold values.
Track object...	List of objects that are being tracked and their corresponding states.

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.

track

To configure an interface to be tracked where the Gateway Load Balancing Protocol (GLBP) weighting changes based on the state of the interface, use the **track** command in global configuration mode. To remove the tracking, use the **no** form of this command.

track *object-number* **interface** *type number* {**line-protocol** | **ip routing**}

no track *object-number* **interface** *type number* {**line-protocol** | **ip routing**}

Syntax Description

object-number	Object number in the range from 1 to 500 representing the interface to be tracked.
interface *type number*	Interface type and number to be tracked.
line-protocol	Tracks whether the interface is up.
ip routing	Tracks whether IP routing is enabled, an IP address is configured on the interface, and the interface state is up, before reporting to GLBP that the interface is up.

Defaults

The state of the interfaces is not tracked.

Command Modes

Global configuration

Command History

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

Usage Guidelines

Use the **track** command in conjunction with the **glbp weighting** and **glbp weighting track** commands to configure parameters for an interface to be tracked. If a tracked interface on a GLBP router goes down, the weighting for that router is reduced. If the weighting falls below a specified minimum, the router will lose its ability to act as an active GLBP virtual forwarder.

Examples

In the following example, Fast Ethernet interface 0/0 tracks whether serial interfaces 2/0 and 3/0 are up. If either serial interface goes down, the GLBP weighting is reduced by the default value of 10. If both serial interfaces go down, the GLBP weighting will fall below the lower threshold and the router will no longer be an active forwarder. To resume its role as an active forwarder, the router must have both tracked interfaces back up, and the weighting must rise above the upper threshold.

```
track 1 interface serial 2/0 line-protocol
track 2 interface serial 3/0 line-protocol
interface FastEthernet 0/0
 ip address 10.21.8.32 255.255.255.0
 glbp 10 weighting 110 lower 95 upper 105
 glbp 10 weighting track 1
 glbp 10 weighting track 2
```

In the following example, Fast Ethernet interface 0/0 tracks whether serial interface 2/0 is enabled for IP routing, whether it is configured with an IP address, and whether the state of the interface is up. If serial interface 2/0 goes down, the GLBP weighting is reduced by a value of 20.

```
track 2 interface serial 2/0 ip routing
interface FastEthernet 0/0
 ip address 10.21.8.32 255.255.255.0
 glbp 10 weighting 110 lower 95 upper 105
 glbp 10 weighting track 2 decrement 20
```

Related Commands

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

Glossary

AVF—active virtual forwarder. One virtual forwarder within a GLBP group is elected as active virtual forwarder for a specified virtual MAC address, and is responsible for forwarding packets sent to that MAC address. Multiple active virtual forwarders can exist for each GLBP group.

AVG—active virtual gateway. One virtual gateway within a GLBP group is elected as the active virtual gateway, and is responsible for the operation of the protocol.

GLBP gateway—Gateway Load Balancing Protocol gateway. A router or gateway running GLBP. Each GLBP gateway may participate in one or more GLBP groups.

GLBP group—Gateway Load Balancing Protocol group. One or more GLBP gateways configured with the same GLBP group number on connected Ethernet interfaces.

vIP—virtual IP address. An IPv4 address. There must be only one virtual IP address for each configured GLBP group. The virtual IP address must be configured on at least one GLBP group member. Other GLBP group members can learn the virtual IP address from hello messages.