FHRP - GLBP Support for IPv6

IPv6 routing protocols ensure router-to-router resilience and failover. However, in situations in which the path between a host and the first-hop router fails, or the first-hop router itself fails, first hop redundancy protocols (FHRPs) ensure host-to-router resilience and failover. The Gateway Load Balancing Protocol (GLBP) FHRP protects data traffic from a failed router or circuit, while allowing packet load sharing between a group of redundant routers.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Prerequisites for FHRP - GLBP Support for IPv6

- Before configuring GLBP, ensure that the routers can support multiple MAC addresses on the physical interfaces. An additional MAC address is used for each GLBP forwarder to be configured.
- Avoid static link-local addressing on interfaces configured with GLBP.

Information About FHRP - GLBP Support for IPv6

GLBP for IPv6 Overview

The Gateway Load Balancing Protocol feature provides automatic router backup for IPv6 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 IPv6 router while sharing the IPv6 packet forwarding load. GLBP performs a similar function for the user as HSRP. HSRP allows multiple routers to participate in a virtual router group configured with a virtual IPv6 address. One member is elected to be the active router to forward packets sent to the virtual IPv6 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. The advantage of GLBP is that it additionally provides load balancing over multiple routers (gateways) using a single virtual IPv6 address and multiple virtual MAC addresses. The forwarding load is shared among all routers in a GLBP group rather than being handled by a single router while the other routers stand idle. Each host is configured with the same virtual IPv6 address, and all routers in the virtual router group participate in forwarding packets

GLBP Benefits

GLBP for IPv6 provides the following benefits:

Load Sharing

You can configure GLBP in such a way that traffic from LAN clients can be shared equitably among multiple 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 also use the industry-standard Message Digest algorithm 5 (MD5) algorithm for improved reliability, security, and protection against GLBP-spoofing software. A router within a GLBP group with a different authentication string than other routers will be ignored by other group members. You can alternatively use a simple text password authentication scheme between GLBP group members to detect configuration errors.

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 if 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.

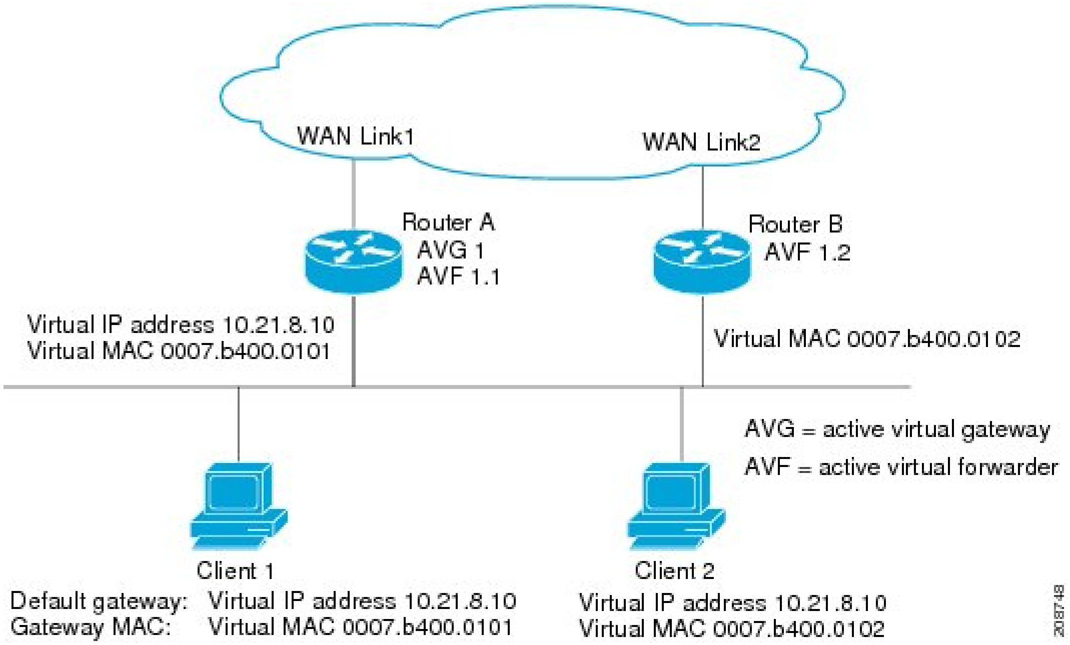
The AVG is also responsible for answering Address Resolution Protocol (ARP) requests for the virtual IP address. Load sharing is achieved by the AVG replying to the ARP requests with different virtual MAC addresses.

Prior to Cisco IOS Release 15.0(1)M1 and 12.4(24)T2, when the **no glbp load-balancing** command is configured, the AVG always responds to ARP requests with the MAC address of its AVF.

In Cisco IOS Release 15.0(1)M1 and 12.4(24)T2, and later releases, when the **no glbp load-balancing** command is configured, if the AVG does not have an AVF, it preferentially responds to ARP requests with the MAC address of the first listening virtual forwarder (VF), which will causes traffic to route via another gateway until that VF migrates back to being the current AVG.

In the figure below, Router A (or Device 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 (or Device 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 because Router B is sharing the traffic load with Router A.

Figure 1: GLBP Topology


WAN Link1
WAN Link2
Router A
AVG 1
AVF 1.1
Router B
AVF 1.2
Virtual IP address 10.21.8.10
Virtual MAC 0007.b400.0101
Virtual MAC 0007.b400.01 02
AVG = active virtual gateway
AVF = active virtual forwarder
Client 1
Client 2
Default gateway: Virtual IP address 10.21.8.10
Gateway MAC: Virtual MAC 0007.b400.0101
Virtual IP address 10.21.8.10
Virtual MAC 0007.b400.0102
208748

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 device 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 IPv6 address. A new standby virtual gateway is then elected from the gateways in the listen state.

GLBP Virtual Forwarder Redundancy

GLBP 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 using the old virtual forwarder MAC address in ICMPv6 ND replies, although the virtual forwarder will continue to forward packets that were sent to the old virtual forwarder MAC address.

The secondary hold time is the interval during which the virtual forwarder is valid. When the secondary hold time 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 the results 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 the figure above, 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 higher priority would be elected. If both routers have the same priority, the backup virtual gateway with the higher IPv6 address would be elected to become the active virtual gateway.

By default, the GLBP virtual 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 virtual gateway 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 can be used to determine 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. When the weighting 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.

By default, the GLBP virtual forwarder preemptive scheme is enabled with a delay of 30 seconds. A backup virtual forwarder can become the AVF if the current AVF weighting falls below the low weighting threshold for 30 seconds. You can disable the GLBP forwarder preemptive scheme using the **no glbp forwarder preempt** command or change the delay using the **glbp forwarder preempt delay minimum** command.

How to Configure FHRP - GLBP Support for IPv6

Configuring and Customizing GLBP

Customizing GLBP behavior 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.

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 device 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.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip address** *ip-address mask* [**secondary**]
5. **glbp** *group* **timers** [**msec**] *hellotime* [**msec**] *holdtime*
6. **glbp** *group* **timers redirect** *redirect timeout*
7. **glbp** *group* **load-balancing** [**host-dependent** | **round-robin** | **weighted**]
8. **glbp** *group* **priority** *level*
9. **glbp** *group* **preempt** [**delay minimum** *seconds*]
10. **glbp** *group* **client-cache maximum** *number* [**timeout** *minutes*]
11. **glbp** *group* **name** *redundancy-name*
12. **exit**
13. **no glbp sso**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Device(config)# interface fastethernet 0/0`	Specifies an interface type and number, and enters interface configuration mode.
Step 4	**ip address** *ip-address mask* [**secondary**] **Example:** `Device(config-if)# ip address 10.21.8.32 255.255.255.0`	Specifies a primary or secondary IP address for an interface.
Step 5	**glbp** *group* **timers** [**msec**] *hellotime* [**msec**] *holdtime*	Configures the interval between successive hello packets sent by the AVG in a GLBP group.

	Command or Action	Purpose
	Example: `Device(config-if)# glbp 10 timers 5 18`	• 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.
Step 6	**glbp** *group* **timers redirect** *redirect timeout* **Example:** `Device(config-if)# glbp 10 timers redirect 1800 28800`	Configures the time interval during which the AVG continues to redirect clients to an AVF. The default is 600 seconds (10 minutes). • The *timeout* argument specifies the interval in seconds before a secondary virtual forwarder becomes invalid. The default is 14,400 seconds (4 hours). **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, a zero setting is not recommended and, if used, results in a redirect timer that never expires. If the redirect timer does not expire, and the device fails, new hosts continue to be assigned to the failed device instead of being redirected to the backup.
Step 7	**glbp** *group* **load-balancing** [**host-dependent** | **round-robin** | **weighted**] **Example:** `Device(config-if)# glbp 10 load-balancing host-dependent`	Specifies the method of load balancing used by the GLBP AVG.
Step 8	**glbp** *group* **priority** *level* **Example:** `Device(config-if)# glbp 10 priority 254`	Sets the priority level of the gateway within a GLBP group. • The default value is 100.
Step 9	**glbp** *group* **preempt** [**delay minimum** *seconds*] **Example:** `Device(config-if)# glbp 10 preempt delay minimum 60`	Configures the device 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.
Step 10	**glbp** *group* **client-cache maximum** *number* [**timeout** *minutes*]	(Optional) Enables the GLBP client cache. • This command is disabled by default.

	Command or Action	Purpose
	Example: `Device(config-if)# glbp 10 client-cache maximum 1200 timeout 245`	• Use the *number* argument to specify the maximum number of clients the cache will hold for this GLBP group. The range is from 8 to 2000. • Use the optional **timeout** *minutes* keyword and argument pair to configure the maximum amount of time a client entry can stay in the GLBP client cache after the client information was last updated. The range is from 1 to 1440 minutes (one day). **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.
Step 11	**glbp** *group* **name** *redundancy-name* **Example:** `Device(config-if)# glbp 10 name abc123`	Enables IP redundancy by assigning a name to the GLBP group. • The GLBP redundancy client must be configured with the same GLBP group name so the redundancy client and the GLBP group can be connected.
Step 12	**exit** **Example:** `Device(config-if)# exit`	Exits interface configuration mode, and returns the device to global configuration mode.
Step 13	**no glbp sso** **Example:** `Device(config)# no glbp sso`	(Optional) Disables GLBP support of SSO.

Configuring GLBP Authentication

The following sections describe configuration tasks for GLBP authentication. The task you perform depends on whether you want to use text authentication, a simple MD5 key string, or MD5 key chains for authentication.

GLBP MD5 authentication provides greater security than the alternative plain text authentication scheme. MD5 authentication allows each GLBP group member to use a secret key to generate a keyed MD5 hash that is part of the outgoing packet. A keyed hash of an incoming packet is generated and, if the hash within the incoming packet does not match the generated hash, the packet is ignored.

The key for the MD5 hash can either be given directly in the configuration using a key string or supplied indirectly through a key chain.

A router will ignore incoming GLBP packets from routers that do not have the same authentication configuration for a GLBP group. GLBP has three authentication schemes:

- No authentication.
- Plain text authentication.

- MD5 authentication.

GLBP packets will be rejected in any of the following cases:

- The authentication schemes differ on the router and in the incoming packet.
- MD5 digests differ on the router and in the incoming packet.
- Text authentication strings differ on the router and in the incoming packet.

Configuring GLBP Weighting Values and Object Tracking

GLBP weighting is used to determine whether a GLBP group 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 group weighting drops below a specified value, the group will no longer be an active virtual forwarder. When the weighting rises above a specified value, the group can resume its role as an active virtual forwarder.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **track** *object-number* **interface** *type number* {**line-protocol** | **ip routing**}
4. **exit**
5. **interface** *type number*
6. **glbp** *group* **weighting** *maximum* [**lower** *lower*] [**upper** *upper*]
7. **glbp** *group* **weighting track** *object-number* [**decrement** *value*]
8. **glbp** *group* **forwarder preempt** [**delay minimum** *seconds*]
9. **exit**
10. **show track** [*object-number* | **brief**] [**interface** [**brief**] | **ip route** [**brief**] | **resolution** | **timers**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose

Step 3	**track** *object-number* **interface** *type number* {**line-protocol** | **ip routing**}
	Example:
	`Device(config)# track 2 interface POS 6/0/0 ip routing`
		Configures an interface to be tracked where changes in the state of the interface affect the weighting of a GLBP gateway, and enters tracking configuration mode.
		• 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 4	**exit** **Example:** `Device(config-track)# exit`	Returns to global configuration mode.
Step 5	**interface** *type number* **Example:** `Device(config)# interface GigabitEthernet 0/0/0`	Enters interface configuration mode.
Step 6	**glbp** *group* **weighting** *maximum* [**lower** *lower*] [**upper** *upper*] **Example:** `Device(config-if)# glbp 10 weighting 110 lower 95 upper 105`	Specifies the initial weighting value, and the upper and lower thresholds, for a GLBP gateway.
Step 7	**glbp** *group* **weighting track** *object-number* [**decrement** *value*] **Example:** `Device(config-if)# glbp 10 weighting track 2 decrement 5`	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.
Step 8	**glbp** *group* **forwarder preempt** [**delay minimum** *seconds*] **Example:** `Device(config-if)# glbp 10 forwarder preempt delay minimum 60`	Configures the device to take over as AVF for a GLBP group if the current AVF for a GLBP group falls below its low weighting threshold. • 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.

	Command or Action	Purpose
Step 9	**exit** **Example:** `Device(config-if)# exit`	Returns to privileged EXEC mode.
Step 10	**show track** [*object-number* | **brief**] [**interface** [**brief**] | **ip route** [**brief**] | **resolution** | **timers**] **Example:** `Device# show track 2`	Displays tracking information.

Enabling and Verifying GLBP

Perform this task to enable GLBP on an interface and verify its configuration and operation. 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 required parameters can be learned.

Before You Begin

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

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip address** *ip-address mask* [**secondary**]
5. **glbp** *group* **ip** [*ip-address* [**secondary**]]
6. **exit**
7. **show glbp** [*interface-type interface-number*] [*group*] [*state*] [**brief**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Device(config)# interface GigabitEthernet 0/0/0`	Specifies an interface type and number, and enters interface configuration mode.
Step 4	**ip address** *ip-address mask* [**secondary**] **Example:** `Device(config-if)# ip address 10.21.8.32 255.255.255.0`	Specifies a primary or secondary IP address for an interface.
Step 5	**glbp** *group* **ip** [*ip-address* [**secondary**]] **Example:** `Device(config-if)# glbp 10 ip 10.21.8.10`	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.
Step 6	**exit** **Example:** `Device(config-if)# exit`	Exits interface configuration mode, and returns the device to global configuration mode.
Step 7	**show glbp** [*interface-type interface-number*] [*group*] [*state*] [**brief**] **Example:** `Device(config)# show glbp 10`	(Optional) Displays information about GLBP groups on a device. • Use the optional **brief** keyword to display a single line of information about each virtual gateway or virtual forwarder.

Example

In the following example, sample output is displayed about the status of the GLBP group, named 10, on the device:

```
Device# show glbp 10

GigabitEthernet0/0/0 - 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 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 GLBP

GLBP introduces five privileged EXEC mode commands to enable display of diagnostic output concerning various events relating to the operation of GLBP. 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 device. Perform this task to minimize the impact of using the **debug glbp** commands.

This procedure will minimize the load on the device created by the **debug condition glbp**or **debug glbp** 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 device may be unable to respond due to the processor load of generating the debugging output.

Before You Begin

This task requires a device running GLBP to be attached directly to a console.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **no logging console**
4. Use Telnet to access a device port and repeat Steps 1 and 2.
5. **end**
6. **terminal monitor**
7. **debug condition glbp** *interface-type interface-number group* [*forwarder*]
8. **terminal no monitor**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Device> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**no logging console** **Example:** `Device(config)# no logging console`	Disables all logging to the console terminal. • To reenable logging to the console, use the**logging console** command in global configuration mode.
Step 4	Use Telnet to access a device port and repeat Steps 1 and 2.	Enters global configuration mode in a recursive Telnet session, which allows the output to be redirected away from the console port.

Step 5	**end**
	Example:
	`Device(config)# end`
		Exits to privileged EXEC mode.

Step 6	**terminal monitor** **Example:** `Device# terminal monitor`	Enables logging output on the virtual terminal.
Step 7	**debug condition glbp** *interface-type interface-number group* [*forwarder*] **Example:** `Device# debug condition glbp GigabitEthernet0/0/0 1`	Displays debugging messages about GLBP conditions. • Try to enter only specific **debug condition glbp** or **debug glbp** commands to isolate the output to a certain subcomponent and minimize the load on the processor. Use appropriate arguments and keywords to generate more detailed debug information on specified subcomponents. • Enter the specific **no debug condition glbp** or **no debug glbp** command when you are finished.
Step 8	**terminal no monitor** **Example:** `Device# terminal no monitor`	Disables logging on the virtual terminal.

Configuration Examples for FHRP - GLBP Support for IPv6

Example: Customizing GLBP Configuration

```
Device(config)# interface fastethernet 0/0
Device(config-if)# ip address 10.21.8.32 255.255.255.0
Device(config-if)# glbp 10 timers 5 18
Device(config-if)# glbp 10 timers redirect 1800 28800
Device(config-if)# glbp 10 load-balancing host-dependent
Device(config-if)# glbp 10 priority 254
Device(config-if)# glbp 10 preempt delay minimum 60
Device(config-if)# glbp 10 client-cache maximum 1200 timeout 245
```

Example: Enabling GLBP Configuration

In the following example, the device is configured to enable GLBP, and the virtual IP address of 10.21.8.10 is specified for GLBP group 10:

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

Additional References

Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	*IPv6 Configuration Guide*
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
IPv6 commands	*Cisco IOS IPv6 Command Reference*
Cisco IOS IPv6 features	Cisco IOS IPv6 Feature Mapping
GLBP	*Configuring GLBP*

Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	*IPv6 RFCs*

MIBs

MIB	MIBs Link
	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for FHRP - GLBP Support for IPv6

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for FHRP--GLBP Support for IPv6

Feature Name	Releases	Feature Information
FHRP--GLBP Support for IPv6	12.2(58)SE 12.2(33)SXI 12.4(6)T	GLBP protects data traffic from a failed router or circuit while allowing packet load sharing between a group of redundant routers. The following commands were introduced or modified: **glbp forwarder preempt**, **glbp ipv6**, **glbp load-balancing**, **glbp preempt**, **glbp priority**, **glbp name**, **glbp timers**, **glbp timers redirect**, **glbp weighting**, **glbp weighting track**, **track interface**.

Glossary

- **CPE** --Customer premises equipment
- **FHRP** --First hop redundancy protocol
- **GLBP** --Gateway load balancing protocol
- **HSRP** --Hot standby routing protocol
- **NA** --Neighbor advertisement
- **ND** --Neighbor Discovery
- **NS** --Neighbor solicitation
- **PE** --Provider equipment
- **RA** --Router advertisement
- **RS** --Router solicitation