

First Hop Redundancy Protocols (FHRP) - Overview

Protocol	HSRP CISCO-PROPRIETARY Hot Standby Router protocol	VRRP Multi-Vendor Virtual Router Redundancy Protocol	GLBP CISCO-PROPRIETARY Gateway Load Balancing Protocol
Terminology	One Active Router, one Standby Router, other Routers in Standby group (able to assume roles)	One Master, one or more Backup Virtual Routers	Active Virtual Gateway (AVG), Standby Virtual GW (SVG), Active Virtual Forwarders (AVFs)
Virtual object	GW IP, bound to the group-specific HSRP MAC address: 0000.0C07.ACXX (v1, XX is Group ID) 0000.0C9F.FXXX (v2, XXX is Group ID) 0005.73A0.0000 - 0005.73A0.0FFF (IPv6)	GW IP, bound to the group-specific VRRP-managed MAC address: 0000.5E00.01XX (XX is VRID)	GW IP bound to an AVG-managed set of virtual MAC addresses, one for each of the physical routers in the group.
Communication Method and Destination	IP Multicast 224.0.0.2 (v1) 224.0.0.102 (v2)	IP Multicast 224.0.0.18 (IPv4) FF02:0:0:0:0:0:12 (IPv6)	IP Multicast 224.0.0.102
Communication Protocol	IPv4, UDP port 1985 IPv6, UDP port 2029	IPv4 and IPV6, protocol 112 (IANA)	IPv4, UDP port 3222
Authentication	Default: No authentication Plain text authentication MD5 authentication (newly added)	Default: No authentication Plain text authentication MD5 authentication	Default: No authentication Plain text authentication
Active Selector	Priority – Hard-coded. One router is elected as Active, another as Standby router. The remaining routers are in a listen state. Highest value wins. Default: 100	Priority – Highest value wins. Default: 100 Backup, 254 Active	Priority - One gateway is elected as AVG; another is elected as standby virtual GW (SVG). The remaining routers are in a listen state. Highest value wins. Default: 100
Hello and Hold Timer	HELLO - Interval between successive HSRP Hello messages from a given router. Default: 3 sec HOLD - Interval between the receipt of a Hello, and the presumption that the sending router failed. Default: 10 sec	Unlike HSRP and GLBP, VRRP does not learn timers from the master router. VRRP requires that the hello timer of all routers in the group match. HELLO – Default: 1 sec, HOLD - Default: 3 sec	HELLO - Interval between successive GLBP Hello messages from a given router. Default: 3 sec HOLD - Interval between the receipt of a Hello, and the presumption that the sending router failed. Default: 10 sec
Active Timer	10 sec		
Standby Timer	10 sec		
Preemption	Use of preemption allows a HSRP device whose priority has become higher to take over the role as the active router in HSRP. Default: preempt off	With preemption enabled, VRRP switches to a backup if that backup comes online with a priority higher than the new master. Default: preempt on. Exception: The router that owns the IP address(es) associated with the virtual router always preempts.	AVG Preemption allows a backup virtual gateway to become AVG, if it has a higher priority than the current AVG. Default: preempt off AVF (Forwarder) Preemption is similar, except that the forwarder preemption uses weighting instead of priority, and it is enabled by default.

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Role States	<p>HSRP 6 Roles:</p> <table border="0"> <tr> <td style="background-color: #f2f2f2;">Initial</td> <td>Start state, HSRP does not run. This state is entered through a configuration change or when an interface first becomes available.</td> </tr> <tr> <td style="background-color: #f2f2f2;">Learn</td> <td>The router has not determined the virtual IP address and has not yet seen an authenticated hello message from the active router. The router still waits to hear from the active router.</td> </tr> <tr> <td style="background-color: #f2f2f2;">Listen</td> <td>The router knows the virtual IP address, but the router is neither the active router nor the standby router. It listens for 'hello' messages from those routers.</td> </tr> <tr> <td style="background-color: #f2f2f2;">Speak</td> <td>The router sends periodic hello messages and actively participates in the election of the active and/or standby router. 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