Hot Standby Router Protocol

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In computer networking, the **Hot Standby Router Protocol** (**HSRP**) is a [Cisco](https://en.wikipedia.org/wiki/Cisco) [proprietary](https://en.wikipedia.org/wiki/Proprietary_protocol) redundancy protocol for establishing a [fault-tolerant](https://en.wikipedia.org/wiki/Fault-tolerant) [default gateway](https://en.wikipedia.org/wiki/Default_gateway). Version 1 of the protocol was described in [RFC](https://en.wikipedia.org/wiki/RFC_(identifier)) [2281](https://tools.ietf.org/html/rfc2281) in 1998. There is no RFC for version 2 of the protocol.

The protocol establishes an association between gateways in order to achieve default gateway failover if the primary gateway becomes inaccessible. HSRP gateways send [multicast](https://en.wikipedia.org/wiki/Multicast_address) *hello* messages to other gateways to notify them of their priorities (which gateway is preferred) and current status (*active* or *standby*).



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Operation[[edit](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit&section=1)]

The primary router with the highest configured priority will act as a *virtual* router with a pre-defined gateway IP address and will respond to the [ARP](https://en.wikipedia.org/wiki/Address_Resolution_Protocol) or [ND](https://en.wikipedia.org/wiki/Neighbor_Discovery_Protocol) request from machines connected to the LAN with a virtual [MAC address](https://en.wikipedia.org/wiki/MAC_address). If the primary router should fail, the router with the next-highest priority would take over the gateway IP address and answer ARP requests with the same MAC address, thus achieving transparent default gateway failover.

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| **HSRP version** | **IP Protocol** | **Group address** | [**UDP**](https://en.wikipedia.org/wiki/User_Datagram_Protocol)**Port** | **Virtual MAC address range** |
| 1 | IPv4 | 224.0.0.2 (all routers)[[1]](https://en.wikipedia.org/wiki/Hot_Standby_Router_Protocol#cite_note-ciscov2-1) | 1985 | 00:00:0c:07:ac:XX |
| 2 | IPv4 | 224.0.0.102 (HSRP)[[1]](https://en.wikipedia.org/wiki/Hot_Standby_Router_Protocol#cite_note-ciscov2-1) | 1985 | 00:00:0c:9f:fX:XX |
| IPv6 | ff02::66 | 2029 | 00:05:73:a0:0X:XX |

In the virtual MAC address, Xs represent the group ID in [hex](https://en.wikipedia.org/wiki/Hexidecimal).

HSRP is not a [routing protocol](https://en.wikipedia.org/wiki/Routing_protocols) as it does not advertise [IP](https://en.wikipedia.org/wiki/Internet_Protocol) routes or affect the [routing](https://en.wikipedia.org/wiki/Routing) table in any way.

HSRP has the ability to trigger a failover if one or more interfaces on the router go down. This can be useful for dual branch routers each with a single link back to the [gateway](https://en.wikipedia.org/wiki/Gateway_(telecommunications)). If the link of the primary router goes down, the backup router will take over the primary functionality and thus retain connectivity to the gateway.

Version 2[[edit](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit&section=2)]

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|  | This section **does not**[**cite**](https://en.wikipedia.org/wiki/Wikipedia:Citing_sources)**any**[**sources**](https://en.wikipedia.org/wiki/Wikipedia:Verifiability). Please help [improve this section](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit) by [adding citations to reliable sources](https://en.wikipedia.org/wiki/Help:Referencing_for_beginners). Unsourced material may be challenged and [removed](https://en.wikipedia.org/wiki/Wikipedia:Verifiability#Burden_of_evidence). *(June 2019) (*[*Learn how and when to remove this template message*](https://en.wikipedia.org/wiki/Help:Maintenance_template_removal)*)* |

Version 2 of the protocol introduces stability, scalability and diagnostic improvements. It is not compatible with version 1 HSRP.[[1]](https://en.wikipedia.org/wiki/Hot_Standby_Router_Protocol#cite_note-ciscov2-1) There is no RFC for version 2 of the protocol.

* Provides IPv6 support
* Increases the number of HSRP groups from 256 to 4096

See also[[edit](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit&section=3)]

* [Virtual Router Redundancy Protocol](https://en.wikipedia.org/wiki/Virtual_Router_Redundancy_Protocol) - standards-based alternative to HSRP
* [Gateway Load Balancing Protocol](https://en.wikipedia.org/wiki/Gateway_Load_Balancing_Protocol) - Cisco proprietary router redundancy solution providing load balancing
* [Common Address Redundancy Protocol](https://en.wikipedia.org/wiki/Common_Address_Redundancy_Protocol) - open source, patent-free and unrestricted alternative to HSRP and VRRP
* [First-hop redundancy protocols](https://en.wikipedia.org/wiki/First-hop_redundancy_protocols) - List of default gateway redundancy protocols

References[[edit](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit&section=4)]

* 1. ^ [Jump up to:***a***](https://en.wikipedia.org/wiki/Hot_Standby_Router_Protocol#cite_ref-ciscov2_1-0) [***b***](https://en.wikipedia.org/wiki/Hot_Standby_Router_Protocol#cite_ref-ciscov2_1-1) [***c***](https://en.wikipedia.org/wiki/Hot_Standby_Router_Protocol#cite_ref-ciscov2_1-2) [*First Hop Redundancy Protocols Configuration Guide, Cisco IOS Release 15M&T*](http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/ipapp_fhrp/configuration/15-mt/fhp-15-mt-book/fhp-hsrp-v2.html)*,*[*Cisco Systems*](https://en.wikipedia.org/wiki/Cisco_Systems)*, retrieved 2016-05-28*

Further reading[[edit](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit&section=5)]

* *Gruszczyk, Katarzyna; Szukała, Krzysztof.*[*"Configuration of HSRP® Protocol on the sample network topology"*](https://web.archive.org/web/20090606064844/http:/www.szukalak.ovh.org/)*. Supervised and led by Dawid Mentel. Archived from*[*the original*](http://www.szukalak.ovh.org/)*on 2009-06-06.*

External links[[edit](https://en.wikipedia.org/w/index.php?title=Hot_Standby_Router_Protocol&action=edit&section=6)]

* [Cisco: HSRP Features](http://www.cisco.com/en/US/tech/tk648/tk362/technologies_tech_note09186a0080094a91.shtml)