

## Objective

This tech note outlines the main differences in Hot Standby Routing Protocol (HSRP) (IPv4) support between Cisco® NX-OS Software and Cisco IOS® Software. Sample configurations are included for Cisco NX-OS and Cisco IOS Software for some common features to demonstrate the similarities and differences. Please refer to the [NX-OS documentation on Cisco.com](#) for a complete list of supported features.

## HSRP Overview

HSRP is a Cisco proprietary First Hop Redundancy Protocol (FHRP) designed to allow transparent failover for an IP client's default gateway (first-hop router).

## Important Cisco NX-OS and Cisco IOS Software Differences

In Cisco NX-OS:

- HSRP command-line interface (CLI) configuration and verification commands are not available until you enable the HSRP feature with the **feature hsrp** command.
- HSRP is hierarchical. All related commands for an HSRP group are configured under the group number.
- The HSRP configuration commands use the format **hsrp** *<option>* instead of **standby** *<option>*.
- The HSRP verification commands use the format **show hsrp** *<option>* instead of **show standby** *<option>*.
- HSRP supports stateful process restarts, and switchovers if two supervisor modules are present.
- The hello and hold-time timer ranges for the millisecond options are different. In Cisco NX-OS, hello = 250 to 999 milliseconds, and hold time = 750 to 3000 milliseconds. In Cisco IOS Software, hello = 15 to 999 milliseconds, and hold time = 50 to 3000 milliseconds.
- Proxy-ARP is not supported when configuring multiple HSRP groups on a physical or logical interface. Cisco IOS Software supports proxy-ARP when configuring multiple HSRP groups on an interface.
- HSRP supports Bidirectional Forwarding Detection (BFD). Cisco IOS Software does not support BFD for HSRP.

## Things You Should Know

The following list provides some additional facts about Cisco NX-OS that should be helpful when designing, configuring, and maintaining HSRP-enabled networks.

- If you remove the **feature hsrp** command, all relevant HSRP configuration information is also removed.
- HSRPv1 is enabled by default (HSRPv2 can be enabled per interface).
- HSRPv1 supports 256 group numbers (0 to 255). HSRPv2 supports 4096 group numbers (0 to 4095).
- HSRPv1 and HSRPv2 are not compatible. However, a device can be configured to run a different version on different interfaces.
- The **show running-config hsrp** command displays the current HSRP configuration.
- Configuration of more than one FHRP on an interface is not recommended.
- Both HSRP devices forward traffic when configured in a vPC domain.

## Cisco\_NX-OS/IOS\_HSRP\_Comparison

- HSRP timers should not be adjusted when configured on SVI's in a vPC domain since both vPC peers will forward traffic destined to the HSRP virtual IP address and the timers only determine which peer is responsible for managing the control-plane functionality of HSRP.
- Object tracking is supported. Tracking can be configured for an interface's line protocol state, IP address state, and for IP route reachability (determining whether a route is available in the routing table).
- Object Tracking can be enabled using Boolean or threshold list types for finer fail-over granularity.
- An interface HSRP group can track multiple objects by referencing more than one tracked object.
- Secondary IP addresses are supported in the same or a different group as the interface's primary IP address.
- Load sharing can be accomplished by using multiple HSRP groups per interface (Proxy-ARP is not supported as documented in the previous section)
- HSRP has been enhanced for vPC environments, so both the active and standby router can forward data traffic. The primary router (higher priority) responds to ARP requests.
- Extended hold timers can be configured globally (**hsrp timers extended-hold**) to temporarily extend timeout values during an In Service Software Upgrade (ISSU). This prevents unnecessary HSRP switch-overs in environments that use aggressive hello/hold timers.

### Configuration Comparison

The following sample code shows configuration similarities and differences between the Cisco NX-OS and Cisco IOS Software CLIs. There are two significant differences: Cisco NX-OS uses a hierarchical configuration, and it uses the **hsrp** keyword instead of the **standby** keyword for configuration and verification commands. The enhancements make the configuration easier to read and work with.

#### *Cisco IOS CLI*

##### Enabling the HSRP Feature

##### Configuring HSRP on an Interface

##### Configuring the priority and preempt Options

#### *Cisco NX-OS CLI*

```
feature hsrp
```

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp 0
```

```
ip 192.168.10.1
```

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp 0
```

```
preempt
```

## Cisco\_NX-OS/IOS\_HSRP\_Comparison

```
priority 110
```

```
ip 192.168.10.1
```

### **Modifying the Hello and Holdtime Timers (Seconds)**

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp 0
```

```
timers 1 3
```

```
ip 192.168.10.1
```

### **Modifying the Hello and Holdtime Timers (Milliseconds)**

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp 0
```

```
timers msec 250 msec 750
```

```
ip 192.168.10.1
```

### **Configuring MD5 Authentication**

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp 0
```

```
authentication md5 key-string cisco123
```

```
ip 192.168.10.1
```

### **Configuring HSRP Version 2 on an Interface**

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp version 2
```

### **Configuring Minimum and Reload Initialization Delay**

```
interface Ethernet2/1
```

```
ip address 192.168.10.2/24
```

```
hsrp delay minimum 5 reload 10
```

### **Configuring Object Tracking (Interface Line-Protocol)**

```
track 1 interface ethernet 2/2 line-protocol
```

## Cisco\_NX-OS/IOS\_HSRP\_Comparison

```

interface Ethernet2/1
ip address 192.168.10.2/24

hsrp 0

track 1 decrement 20

ip 192.168.10.1
    
```

### Verification Command Comparison

The following table compares some useful **show** commands for verifying and troubleshooting an HSRP configuration.

Cisco NX-OS HSRP	Cisco IOS Software HSRP	Command Description
<b>show hsrp</b>	show standby	Displays detailed information for all HSRP groups
<b>show hsrp active</b>	-	Displays all of the groups in the ?active? state
<b>show hsrp all</b>	show standby all	Displays all of the groups including groups in the disabled state
<b>show hsrp bfd-sessions</b>	-	Displays all BFD sessions
<b>show hsrp brief</b>	show standby brief	Displays a summary of all the HSRP groups
<b>show hsrp delay</b>	show standby delay	Displays minimum and maximum delay times for preempting
<b>show hsrp detail</b>	-	Displays detailed information
<b>show hsrp group &lt;#&gt;</b>	-	Displays detailed information for a specified group
<b>show hsrp init</b>	-	Displays all the groups in the "init" state
<b>show hsrp interface</b>	show standby <i>int-type</i>	Displays detailed information for a specific interface
<b>show hsrp learn</b>	-	Displays all the groups in the "learn" state
<b>show hsrp listen</b>	-	Displays all the groups in the "listen" state
<b>show hsrp speak</b>	-	Displays all the groups in the "speak" state
<b>show hsrp standby</b>	-	Displays all the groups in the "standby" state
<b>show hsrp summary</b>	-	Displays summary information for HSRP groups
<b>show track</b>	show track	Displays the configured tracked objects
<b>show track brief</b>	show track brief	Displays a brief list of tracked objects
<b>show track interface</b>	show track interface	Displays the status of tracked interfaces
<b>show track ip</b>	show track ip	Displays the IP protocol objects that are tracked