VRRPv3: Object Tracking Integration

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Information About VRRPv3: Object Tracking Integration

This section provides information about the VRRPv3 support for IPv6 Object Tracking.

Overview of VRRPv3: Object Tracking Integration

Virtual Router Redundancy Protocol (VRRP) enables a group of devices to form a single virtual device to provide redundancy. The LAN clients can then be configured with the virtual device as the default gateway. The virtual device is also known as a VRRP group. The VRRPv3: Object Tracking Integration feature allows you to track the behavior of an object and receive notifications of changes. This module explains how object tracking, in particular, the tracking of IPv6 objects, is integrated into VRRP Version 3 (VRRPv3), and describes how to track an IPv6 object using a VRRPv3 group. See the VRRP Object Tracking, on page 1 section for more information on object tracking.

VRRP Object Tracking

Object tracking is an independent process that manages creation, monitoring, and removal of tracked objects such as the state of the line protocol of an interface. Client processes such as the Hot Standby Router Protocol (HSRP), Gateway Load Balancing Protocol (GLBP), and VRRP register their interest with specific tracked objects and act when the state of an object changes.

Each tracked object is identified by a unique number that is specified on the tracking CLI. Client processes such as VRRP use this number to track a specific object.

The tracking process periodically polls the tracked objects and notes change of value, if any. The changes in the tracked object are communicated to interested client processes, either immediately or after a specified delay. The object values are reported as either up or down.

VRRP object tracking gives VRRP access to all the objects available through the tracking process. The tracking process allows you to track individual objects such as the state of an interface line protocol, state of an IP route, or the reachability of a route.

VRRP provides an interface to the tracking process. Each VRRP group can track multiple objects that might affect the priority of the VRRP device. You specify the object number to be tracked and VRRP is notified of changes to the object, if any. VRRP increments (or decrements) the priority of a virtual device based on the state of the object being tracked.

How VRRP Object Tracking Affects the Priority of a Device

The priority of a device can change dynamically if it has been configured for object tracking and the object that is being tracked goes down. The tracking process periodically polls the tracked objects and notes change of value, if any. The changes in the tracked object are communicated to VRRP, either immediately or after a specified delay. The object values are reported as either up or down. Examples of objects that can be tracked are the line protocol state of an interface or the reachability of an IP route. If the specified object goes down, the VRRP priority is reduced. The VRRP device with the higher priority can now become the primary virtual device if it has the **vrrp preempt** command configured. See the VRRP Object Tracking, on page 1 section for more information on object tracking.

How to Configure VRRPv3: Object Tracking Integration

This section provides the configuration steps for IPv6 object tracking using VRRPv3:

Tracking an IPv6 Object Using VRRPv3

Procedure

	Command or Action	Purpose
Step 1	**fhrp version vrrp v3** **Example:** `Device(config)# fhrp version vrrp v3`	Enables you to configure VRRPv3 and Virtual Router Redundancy Service (VRRS) on a device. **Note** When VRRPv3 is in use, VRRPv2 is unavailable.
Step 2	**interface** *type number* **Example:** `Device(config)# interface GigabitEthernet 0/0/0`	Specifies an interface and enters interface configuration mode.
Step 3	**vrrp** *group-id* **address-family ipv6** **Example:**	Creates a VRRP group for IPv6 and enters VRRP configuration mode.

	Command or Action	Purpose
	`Device(config-if)# vrrp 1 address-family ipv6`	
Step 4	**track** *object-number* **decrement** *number* **Example:** `Device(config-if-vrrp)# track 1 decrement 20`	Configures the tracking process to track the state of the IPv6 object used by the VRRPv3 group. VRRP on the interface then registers with the tracking process to be informed of any changes to the IPv6 object on the VRRPv3 group. If the tracked IPv6 object state configured on the interface goes down, the priority of the VRRP group is reduced by 20.
Step 5	**end** **Example:** `Device(config-if-vrrp)# end`	Returns to privileged EXEC mode.

Configuration Examples for VRRPv3: Object Tracking Integration

This section provides the configuration examples for IPv6 Object Tracking using VRRPv3.

Example: Tracking an IPv6 Object Using VRRPv3

The following example shows how a tracking process is configured to track the state of the IPv6 object used by the VRRPv3 group. VRRP on the interface then registers with the tracking process to be informed of any changes to the IPv6 object on the VRRPv3 group. If the IPv6 object state on the interface VRRPv3 goes down, the priority of the VRRP group is reduced by 20:

```
Device(config)# fhrp version vrrp v3
Device(config)# interface GigabitEthernet 0/0/0
Device(config-if)# vrrp 1 address-family ipv6
Device(config-if-vrrp)# track 1 decrement 20
```

Example: Verifying VRRP IPv6 Object Tracking

The following examples show how to verify the VRRP IPv6 object tracking process configuration:

```
Device# show vrrp

GigabitEthernet0/0/0 - Group 1 - Address-Family IPv4
  State is BACKUP
  State duration 1 mins 41.856 secs
  Virtual IP address is 172.24.1.253
  Virtual MAC address is 0000.5E00.0101
  Advertisement interval is 1000 msec
  Preemption enabled
  Priority is 80 (configured 100)
```

```
    Track object 1 state Down decrement 20
  Master Router is 172.24.1.2, priority is 100
  Master Advertisement interval is 1000 msec (learned)
  Master Down interval is 3609 msec (expires in 3297 msec)

Device# show track ipv6 route brief

Track Type        Instance                  Parameter        State Last Change
601   ipv6 route  3172::1/32                metric threshold Down  00:08:55
602   ipv6 route  3192:ABCD::1/64           metric threshold Down  00:08:55
603   ipv6 route  3108:ABCD::CDEF:1/96      metric threshold Down  00:08:55
604   ipv6 route  3162::EF01/16             metric threshold Down  00:08:55
605   ipv6 route  3289::2/64                metric threshold Down  00:08:55
606   ipv6 route  3888::1200/64             metric threshold Down  00:08:55
607   ipv6 route  7001::AAAA/64             metric threshold Down  00:08:55
608   ipv6 route  9999::BBBB/64             metric threshold Down  00:08:55
611   ipv6 route  1111::1111/64             reachability     Down  00:08:55
612   ipv6 route  2222:3333::4444/64        reachability     Down  00:08:55
613   ipv6 route  5555::5555/64             reachability     Down  00:08:55
614   ipv6 route  3192::1/128               reachability     Down  00:08:55
```

Additional References for VRRPv3: Object Tracking Integration

RFCs

RFCs	Title
RFC 792	*Internet Control Message Protocol*
RFC 1828	*IP Authentication Using Keyed MD5*
RFC 5798	*Virtual Router Redundancy Protocol*

Feature History for VRRPv3: Object Tracking Integration

This table provides release and related information for the features explained in this module.

These features are available in all the releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Gibraltar 16.11.1	VRRPv3: Object Tracking Integration	VRRP enables a group of devices to form a single virtual device to provide redundancy. Object tracking is an independent process that manages the creation, monitoring, and removal of tracked objects such as: the state of the line protocol of an interface, the state of an IP route, or the reachability of a route. Clients (like VRRP) register their interest with specific tracked objects and act when the state of an object changes. Starting with this release, the VRRPv3 Object Tracking Integration features supports IPv6. Support for this feature was introduced only on the C9500-32C, C9500-32QC, C9500-48Y4C, and C9500-24Y4C models of the Cisco Catalyst 9500 Series Switches.
Cisco IOS XE Cupertino 17.7.1	VRRPv3: Object Tracking Integration	This feature was implemented on the C9500X-28C8D model.

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