

VRRP Interface Tracking

Table 1: Feature History

Feature Name	Release Information	Description
VRRP Interface Tracking for Cisco vEdge Devices	Cisco SD-WAN Release 20.4.1 Cisco vManage Release 20.4.1	This feature enables VRRP to set the edge as active or standby based on the WAN Interface or SIG tracker events and increase the TLOC preference value on a new VRRP active to ensure traffic symmetry, for Cisco vEdge Devices. In this release, you can configure VRRP interface tracking using only the CLI template.
VRRP Interface Tracking for Cisco vEdge Devices.	Cisco SD-WAN Release 20.7.1 Cisco vManage Release 20.7.1	Starting this release, you can configure VRRP interface tracking through Cisco SD-WAN Manager feature template on Cisco vEdge Devices.

- Information About VRRP Interface Tracking, on page 2
- Restrictions and Limitations, on page 2
- VRRP Tracking Use Cases, on page 3
- Configure Object Tracker Using a Configuration Group, on page 3
- Workflow to Configure VRRP Tracking, on page 4
- Configure an Object Tracker, on page 5
- Configure VRRP for a VPN Interface Template and Associate Interface Object Tracker, on page 5
- Configure VRRP Tracking Using CLI Templates, on page 6
- Configuration Example for VRRP Object Tracking Using CLI, on page 7
- Configuration Examples for SIG Object Tracking, on page 8
- Verify VRRP Tracking, on page 8

Information About VRRP Interface Tracking

The Virtual Router Redundancy Protocol (VRRP) is a LAN-side protocol that provides redundant gateway service for switches and other IP end stations. In Cisco Catalyst SD-WAN, you can configure VRRP on interfaces and subinterfaces, within a VPN.

For more information, see Configuring VRRP.

The VRRP Tracking feature enables switching to a backup or a secondary VRRP router in the following scenarios:

- If a single tunnel (or two tunnels - when you configure redundancy using Transport Locators (TLOC)) on a vEdge device goes down. In this case, the VRRP priority decrements and the secondary router becomes the primary router. VRRP notifies this change to the overlay through Overlay Management Protocol (OMP).
- VRRP can track up to one interface object or Secure Internet Gateway (SIG) object for a group. The interface object can have up to four interfaces. Hence, a group can track up to four tunnel interfaces. The VRRP priority decrements only if all the interfaces of an interface object go down.

Restrictions and Limitations

- VRRP is only supported with service-side VPNs. If you are using subinterfaces, configure VRRP physical interfaces in VPN 0.
- VRRP tracking is enabled on either a physical uplink interface or a logical tunnel interface (IPSEC or GRE or both).
- The VRRP Tracking feature does not support IP prefix as an object.
- You can track a maximum of four interfaces simultaneously using a single tracker. VRRP state transition gets triggered only if all four interfaces go down.
- You can use the same tracker under multiple VRRP groups or VPNs.
- You cannot configure **tloc-change** and **increase-preference** on more than one VRRP group.
- In Cisco SD-WAN release 20.6.1 and earlier releases, you can configure VRRP tracking only through Cisco vManage CLI template.

Note Starting from Cisco SD-WAN release 20.7.1, you can configure VRRP tracking using Cisco vManage feature template as well.

Note In Cisco SD-WAN release 20.6.1 and earlier releases, to update any existing VRRP configuration and add VRRP tracking, convert the configuration and the VRRP tracking commands to the CLI template.

VRRP Tracking Use Cases

The VRRP state is determined based on the tunnel link status. If the tunnel or interface is down on the primary VRRP, then the traffic is directed to the secondary VRRP. The secondary VRRP router in the LAN segment becomes primary VRRP to provide gateway for the service-side traffic.

Zscaler Tunnel Use Case 1—Primary VRRP, Single Internet Provider

The primary and secondary Zscaler tunnels are connected through a single internet provider to the primary VRRP. The primary and secondary VRRP routers are connected through using TLOC extension. In this scenario, the VRRP state transition occurs if the primary and secondary tunnels go down on primary VRRP. The predetermined priority value decrements when the tracking object is down, which triggers the VRRP state transition. To avoid asymmetric routing, VRRP notifies this change to the Overlay through OMP.

Zscaler Tunnel Use Case 2—VRRP Routers in TLOC Extension, Dual Internet Providers

The primary and secondary VRRP routers are configured in TLOC extension high availability mode. The primary and secondary Zscaler tunnels are directly connected with primary and secondary VRRP routers, respectively, using dual internet providers. In this scenario too, the VRRP state transition occurs if the primary and secondary tunnels go down on primary VRRP. The predetermined priority value decrements when the tracking object is down, which triggers the VRRP state transition. VRRP notifies this change to the Overlay through OMP.

TLOC Preference

Transport Locators (TLOCs) connect an OMP route to a physical location. A TLOC is directly reachable using an entry in the routing table of the physical network, or represented by a prefix beyond a NAT device.

The TLOC change preference is an optional configuration under VRRP group. If you configure TLOC change preference value using the tloc-change-pref command, the value increases by 1 when a node becomes the primary node. The configured or default TLOC preference is applied back on standby state.



Note We recommend that you use the same TLOC preference value for all TLOCs in a site. For a Cisco vEdge device, the default TLOC preference for the tunnel interface can be modified irrespective of whether VRRP is configured or not. However, if you want to use the VRRP tracking feature and utilize the advantage of TLOC preference values for VRRP tracking, ensure that the default tunnel preference is same on both the VRRP routers.

Configure Object Tracker Using a Configuration Group

Before you begin

On the **Configuration** > **Configuration Groups** page, choose **SD-WAN** as the solution type.

Procedure

Step 1 From the Cisco SD-WAN Manager menu, choose **Configuration** > **Configuration Groups**.

Step 2 Create and configure a object tracker in a Service Profile.

Configure basic settings.

Table 2: Basic Settings

Parameter Name	Description
Tracker Type*	
Interface	Configure the following interface values: • **Object tracker ID***: Enter the object tracker ID number. Range: 1-1000 • **Interface name***: Enter the global or device-specific tracker interface name. For example, Gigabitethernet1 or Gigabitethernet2.
SIG	**Object tracker ID***: Enter the object tracker ID number.
Route	Configure the route details: • **Object tracker ID***: Enter the object tracker ID number. Range: 1-1000 • **Route IP***: Enter the IPv4 address of the route. • **Route IP Mask***: Select a value for the subnet mask. • **VPN**: Enter a value for the VPN.

What to do next

Also see Deploy a configuration group.

Workflow to Configure VRRP Tracking

1. Configure an object tracker. For more information, see Configure an Object Tracker, on page 5.
2. Configure VRRP for a VPN Interface template and associate the object tracker with the template. For more information, see Configure VRRP for a VPN Interface Template and Associate Interface Object Tracker, on page 5.

Configure an Object Tracker

Use the **System** template to configure an object tracker.

1. From the Cisco SD-WAN Manager menu, choose **Configuration** > **Templates**.
2. Click **Feature**.
3. Navigate to the **System** template for the device.

Note To create a **System** template, see Create System Template

4. Click **Tracker**, and click **New Object Tracker** to configure the tracker parameters.

Table 3: Tracker Parameters

Field	Description
Tracker Type	Choose Interface or SIG to configure the Object tracker.
Tracker List	Enter the name of the tracker list.
Interface	Choose global or device-specific tracker interface name.

5. Click **Add**.
6. Click **Save**.

Configure VRRP for a VPN Interface Template and Associate Interface Object Tracker

To configure VRRP for a **VPN** template, do the following:

1. From the Cisco SD-WAN Manager menu, choose **Configuration** > **Templates**.
2. Click **Feature Templates**.

Note In Cisco vManage Release 20.7.x and earlier releases, **Feature Templates** is titled **Feature**.

3. Navigate to the **VPN Interface Ethernet** template for the device.

Note For information about creating a new **VPN Interface Ethernet** template, see Configure VPN Ethernet Interface.

4. Click **VRRP** and choose **IPv4**.
5. Click **New VRRP** to create a new VRRP or edit the existing VRRP and configure the following parameters:

Parameter Name	Description
TLOC Preference Change	(Optional) Choose **On** or **Off** to set whether the TLOC preference can be changed or not.

6. Click the **Add Tracking Object** link, and in the **Tracking Object** dialog box that is displayed, click **Add Tracking Object**.
7. In the **Tracker Name** field, enter the name of the tracker.
8. From the **Action** drop-down list, choose **Decrement** and enter the **Decrement Value**.
9. Click **Add**.
10. Click **Add** to save the VRRP details.
11. Click **Save**.

Configure VRRP Tracking Using CLI Templates

You can configure VRRP tracking using the CLI add-on feature templates and CLI device templates. For more information, see CLI Templates.

VRRP Object Tracking Using CLI

Configure Track List Interface

Use the following configuration to add an interface to a track list using Cisco SD-WAN Manager device CLI tempale:

```
Device# config terminal
Device(config)# system
Device(config-system)# track-list zs1 interface ge0/1 gre1 ipsec1
Device(config-track-list-zs1)# commit
Device(config-system-tracker-list-zs1)# exit
Device(config-system)# exit
```

Configure Interface Tracking and Priority Decrement

```
Device(config)# vpn 1
Device(config-vpn-1)# name vpn-name
Device(config- vpn-1)# interface ge0/2
Device(config-interface-ge0/2)# ip address 172.16.10.1/24
Device(config-interface-ge0/2)# no shutdown
Device(config-interface-ge0/2)# vrrp 100
Device(config-vrrp-100)# track zs1 decrement 10
Device(config-vrrp-track-zs1)# exit
Device(config-vrrp-100)# ipv4 172.16.10.100
Device(config-vrrp-100)# tloc-change-pref
```

SIG Container Tracking

The following example shows how to configure a track list and tracking for SIG containers using the Cisco SD-WAN Manager device CLI template.

Note In SIG Object Tracking, you can only set *global* as the variable for Service Name.

Configure Track List for SIG Container

```
Device# config terminal
Device(config)# system
Device(config-system)# track-list SIG sig-container global
Device(config-system-tracker-list-SIG)# exit
Device(config-system)# exit
```

Configure SIG Container Tracking and Priority Decrement

```
Device(config)# vpn 1
Device(config-vpn-1)# name vpn-name
Device(config- vpn-1)# interface ge0/2
Device(config-interface-ge0/2)# ip address 172.16.10.1/24
Device(config-interface-ge0/2)# no shutdown
Device(config-interface-ge0/2)# vrrp 100
Device(config-vrrp-100)# track SIG decrement 10
Device(config-vrrp-track-zs1)# exit
Device(config-vrrp-100)# ipv4 172.16.10.100
Device(config-vrrp-100)# tloc-change-pref
```

Configure SIG Container Tracking for VRRP Group

```
Device(config-vpn-1)# int ge0/4
Device(config-interface-ge0/4)# vrrp 10
Device(config-vrrp-10)# track SIG decrement 10
Device(config-track-SIG)# commit
Commit complete.
Device(config-track-SIG)#
```

Configuration Example for VRRP Object Tracking Using CLI

Interface Object Tracking Using CLI

This example shows how to addan interface to a track list using Cisco vManage device CLI template:

```
Configure terminal
 system
track-list zs1 interface ge0/1 gre1 ipsec1
commit
exit
```

Configure Interface Tracking and Priority Decrement

```
vpn 1
name vpn-name
interface ge0/2
```

```
ip address 172.16.10.1/24
no shutdown
vrrp 100
track zs1 decrement 10
exit
ipv4 172.16.10.100
tloc-change-pref
```

Configuration Examples for SIG Object Tracking

Configure Track List for SIG Container

```
config terminal
system
track-list SIG sig-container global
 exit
exit
```

Configure SIG Container Tracking and Priority Decrement

```
vpn 1
name vpn-name
interface ge0/2
ip address 172.16.10.1/24
no shutdown
vrrp 100
track SIG decrement 10
exit
ipv4 172.16.10.100
tloc-change-pref
```

Verify VRRP Tracking

Device# **show vrrp**

The following is a sample output for the **show vrrp** command:

```
vrrp vpn 1
 interfaces ge0/4
  groups 10
   virtual-ip             10.1.1.2
   virtual-mac            00:00:5e:00:01:0a
   priority               100
   real-priority          100
   vrrp-state             init
   omp-state              up
   advertisement-timer    1
   primary-down-timer     3
   last-state-change-time 0000-00-00T00:00:00+00:00
```

Device# **show vrrp detail**

The following is a sample output for the **show vrrp detail** command:

```
OMP status: up

group-id: 10, track-omp: no, initialized: yes
  address: 10.20.24.1
  track-prefix-list: -, resolved: -
```

```
  state: Primary, down-reason: none, cfg-priority: 100, priority: 100
  adv-timer: 1, primary-down-timer: 3, sock-fd: 23, addr-count: 1
  adv-timer: Enabled (e: 4 v: 10 c: 1)
  primary-down-timer: Disabled (e: -1 v: 30 c: 3)
  virtual-mac: 0x0 0x0 0x5e 0x0 0x1 0xa
  TLOC Change Preference: Configured
  TLOC Change Preference value: 1
  TLOC Real Preference value: 1
  Group current adaptive priority: 0
  Total Tracking object : 1 (head: 0x7f0f6d6771c0)
  Group Address: 0x7f0f6d624100
       Name: zs1
       Decrement: 18
       Adaptive direction: 0
       List Entry :0x7f0f6d687230

Track List:
    Name: zs1
    Total Tracking Objects: 0
    VRRP Daemon: 0x7f0f6d68e140
    Tracking Object: 0x7f0f6d677270
        Type:  1
        VRRP Daemon: 0x7f0f6d68e140
        Total Interface: 1
             Interface: ge0_1(0x7f0f6d66a700)
            Interface Created: Yes
            Operational State: UP
```

Device# **show run system**

The following is a sample output for the **show run system** command:

```
system
host-name               vm6
system-ip               172.16.255.16
site-id                 600
no admin-tech-on-failure
route-consistency-check
organization-name       "vIPtela Inc Regression"
track-list SIG
  container global
!
track-list zs1
  track-interface ge0/1 ge0/7
!
```