Multicast VPN BGP Dampening

A single receiver in a specific multicast group or a group of receivers that are going up and down frequently and interested in a specific multicast group activates the Multicast VPN BGP Dampening feature to dampen type 7 routes (C-multicast route Join/Prune) within the core using BGP signaling. The feature reduces the churn caused by customer-side join/prune requests to avoid unnecessary BGP MVPN type 6/7 C-route control information.

Prerequisites for Multicast VPN BGP Dampening

- You understand the concepts in the “BGP Route Dampening” module of the *IP Routing: BGP Configuration Guide*.

Information About Multicast VPN BGP Dampening

Overview of Multicast VPN BGP Dampening

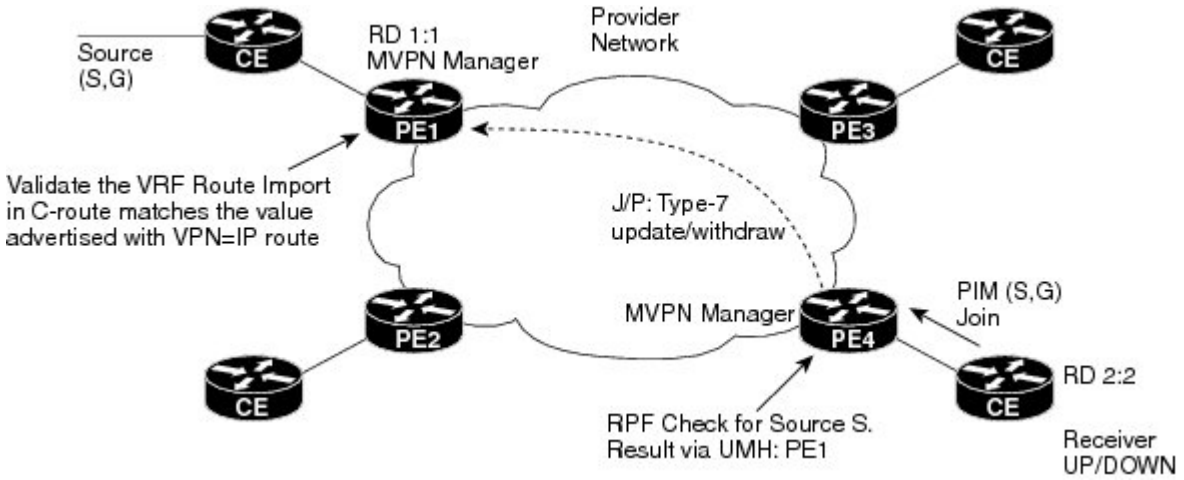
BGP Route Dampening

Route dampening is a BGP feature designed to minimize the propagation of flapping routes across an internetwork. A route is considered to be flapping when its availability alternates repeatedly. Cisco devices that are running BGP contain a mechanism designed to “dampen” the destabilizing effect of flapping routes. When a Cisco device running BGP detects a flapping route, it automatically dampens that route.

The figure below shows illustrates the Multicast VPN BGP dampening mechanism.

Multicast VPN BGP Dampening

Figure 1: Multicast VPN BGP Dampening



A single receiver in a multicast group or a group of receivers that are flapping frequently and interested in a specific multicast group actrivates multicast VPN (MVPN) BGP dampening. MVPN BGP dampening dampens the type 7 multicast routes (customer-multicast, or "C-multicast," route join/prune) within the core using BGP signaling.

When MVPN BGP dampening is not enabled, the source sends data even though the receiver may be down. When the receiver is down, there is no periodic 60-second C-PIM join towards the provider edge (PE) device causing the PIM to timeout on the PE side after the default period (three minutes). The MVPN manager sends a prune message to BGP, which is a type 7 route (C-multicast route withdraw).

When the receiver is up, it sends a new (S,G) join request to the customer edge (CE) device. The C-PIM join is received by the PE device and a new type 7 C-multicast update is sent by BGP to the auto-discovered MVPN peers. The upstream multicast peer converts the BGP type 7 update to a PIM join to the source, and the source sends the data traffic that the receiver should receive via the downstream PE using the MDT tunnel. If the receiver goes up and down frequently, the source side PIM receives join/prune messages frequently and can cause the source to respond accordingly.

When MVPN BGP dampening is enabled, the general dampening mechanism in BGP will be applied to MVPN VRF instances. Join/Prune messages from the CE side are sent from an MVPN manager as updates/withdraw to the MVPN PE device. The MVPN manager on PE devices send join/prune messages to the customer side for Reverse Path Forwarding (RPF) and upstream multihop (UMH) nexthop changes.

How to Configure Multicast VPN BGP Dampening

Configuring Multicast VPN BGP Dampening

Perform this task to enable and configure multicast VPN BGP dampening.

SUMMARY STEPS

1. **enable**

2. **configure terminal**
3. **router bgp** *as-number*
4. **address-family** [**ipv4** | **ipv6**] **mvpn vrf** *vrf-name*
5. **bgp dampening** [*half-life reuse suppress max-suppress-time*]
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**router bgp** *as-number* **Example:** `Device(config)# router bgp 45000`	Enters router configuration mode and creates a BGP routing process.
Step 4	**address-family** [**ipv4**	**ipv6**] **mvpn vrf** *vrf-name* **Example:** `Device(config-router)# address-family ipv4 mvpn vrf blue`	Specifies the address family and enters address family configuration mode. • Use the **ipv4** keyword to enable IPv4 multicast C-route exchange. • Use the **ipv6** keyword to enable IPv6 multicast C-route exchange. **Note** The **vrf** keyword and *vrf-name* argument must be specified at this point to enable multicast VPN BGP dampening in the next step.
Step 5	**bgp dampening** [*half-life reuse suppress max-suppress-time*] **Example:** `Device(config-router-af)# bgp dampening 30 1500 10000 120`	Enables BGP route dampening and changes the default values of route dampening factors. The *half-life*, *reuse*, *suppress*, and *max-suppress-time* arguments are all position dependent; if one argument is entered, then all the arguments must be entered. **Note** Repeat steps 4 and 5 to enable multicast VPN BGP dampening on alternative VRFs.
Step 6	**end** **Example:** `Device(config-router-af)# end`	Exits address family configuration mode and enters privileged EXEC mode.

Monitoring and Maintaining Multicast VPN BGP Dampening

Perform the steps in this task as required to monitor and maintain multicast VPN BGP dampening.

SUMMARY STEPS

1. **enable**
2. **show bgp** {**ipv4** | **ipv6**} **mvpn** {**all** | **rd** *route-distinguisher* | **vpn** *vrf-name*} [**dampening** {**dampened-paths** | **flap-statistics** [**filter-list** *access-list-number* | **quote-regexp** *regexp* | **regexp** *regexp*]}]
3. **clear ip bgp** {**ipv4** | **ipv6**} **mvpn vrf** *vrf-name* {**dampening** | **flap-statistics**}

DETAILED STEPS

Step 1 **enable**

Enables privileged EXEC mode. Enter your password if prompted.

Example:

```
Device> enable
```

Step 2 **show bgp** {**ipv4** | **ipv6**} **mvpn** {**all** | **rd** *route-distinguisher* | **vpn** *vrf-name*} [**dampening** {**dampened-paths** | **flap-statistics** [**filter-list** *access-list-number* | **quote-regexp** *regexp* | **regexp** *regexp*]}]

Use this command to monitor multicast VPN BGP dampening.

- The **dampened-path** keyword displays information about BGP dampened routes.
- The **parameters** keyword displays detailed BGP dampening information.
- The **flap-statistics** keyword displays information on BGP flap statistics.

Example:

```
Device# show bgp ipv4 mvpn vrf blue route-type 7 111.111.111.111:11111 55 202.100.0.6 232.1.1.1

BGP routing table entry for [7][111.111.111.111:11111][55][202.100.0.6/32][232.1.1.1/32]/22, version
 17
Paths: (1 available, no best path)
Flag: 0x820
  Not advertised to any peer
  Refresh Epoch 1
  Local, (suppressed due to dampening)
    0.0.0.0 from 0.0.0.0 (205.3.0.3)
      Origin incomplete, localpref 100, weight 32768, valid, sourced, local
      Extended Community: RT:205.1.0.1:1
      Dampinfo: penalty 3472, flapped 4 times in 00:04:42, reuse in 00:00:23
      rx pathid: 0, tx pathid: 0
```

Step 3 **clear ip bgp** {**ipv4** | **ipv6**} **mvpn vrf** *vrf-name* {**dampening** | **flap-statistics**}

Use this command to clear the accumulated penalty for routes that are received on a router that has multicast VPN BGP dampening enabled.

- The **dampening** keyword clears multicast VPN BGP dampening information.
- The **flap-statistic** keyword clears multicast VPN BGP dampening flap statistics.

Example:

```
Device# clear ip bgp ipv4 mvpn vrf blue dampening
```

Configuration Examples for Multicast VPN BGP Dampening

Example: Configuring Multicast VPN BGP Dampening

The following example shows multicast VPN BGP dampening is applied to the VRFs named blue and red, but not to the VRF named green:

```
address-family ipv4 mvpn vrf blue
 bgp dampening

address-family ipv4 mvpn vrf red
 bgp dampening

address-family ipv4 mvpn vrf green
 no bgp dampening
```

Additional References for Multicast VPN BGP Dampening

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
BGP commands	Cisco IOS IP Routing: BGP Command Reference
BGP route dampening	"BGP Route Dampening" section of the "Configuring Internal BGP Features" module in the *IP Routing: BGP Configuration Guide*

Standards and RFCs

Standard/RFC	Title
RFC 2439	*BGP Route Flap Damping*

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Multicast VPN BGP Dampening

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Multicast VPN BGP Dampening

Feature Name	Releases	Feature Information
Multicast VPN BGP Dampening	Cisco IOS XE Release 3.8S	A single receiver in a specific multicast group or a group of receivers that are going up and down frequently and interested in a specific multicast group will cause the Multicast VPN BGP Dampening feature to dampen type 7 routes (C-multicast route join/prune) within the core using BGP signaling. The following commands were introduced or modified: **address-family mvpn**, **clear ip bgp mvpn**, **show bgp mvpn**, and **show ip bgp ipv4**.