IPv6 Multicast: Bandwidth-Based Call Admission Control

Information About IPv6 Multicast: Bandwidth-Based Call Admission Control

Bandwidth-Based CAC for IPv6 Multicast

The bandwidth-based call admission control (CAC) for IPv6 multicast feature implements a way to count per-interface mroute state limiters using cost multipliers. This feature can be used to provide bandwidth-based CAC on a per-interface basis in network environments where the multicast flows use different amounts of bandwidth.

This feature limits and accounts for IPv6 multicast state in detail. When this feature is configured, interfaces can be limited to the number of times they may be used as incoming or outgoing interfaces in the IPv6 multicast PIM topology.

With this feature, device administrators can configure global limit cost commands for state matching access lists and specify which cost multiplier to use when accounting such state against the interface limits. This feature provides the required flexibility to implement bandwidth-based local CAC policy by tuning appropriate cost multipliers for different bandwidth requirements.

Threshold Notification for mCAC Limit

The threshold notification for mCAC limit feature notifies the user when actual simultaneous multicast channel numbers exceeds or fall below a specified threshold percentage. For example, if the mCAC rate limit is set to 50,000,000 and the configured threshold percentage is 80 percent, then the user is notified if the limit exceeds 10,000,000.

How to Implement IPv6 Multicast Bandwidth-Based Call Admission Control

Configuring the Global Limit for Bandwidth-Based CAC in IPv6

Device administrators can configure global limit cost commands for state matching access lists.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 multicast** [**vrf** *vrf-name*] **limit cost** *access-list cost-multiplier*

DETAILED STEPS

Procedure

	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	**ipv6 multicast** [**vrf** *vrf-name*] **limit cost** *access-list cost-multiplier* **Example:** `Device(config)# ipv6 multicast limit cost costlist1 2`	Applies a cost to mroutes that match per-interface mroute state limiters in IPv6.

Configuring an Access List for Bandwidth-Based CAC in IPv6

In bandwidth-based CAC for IPv6, device administrators can configure global limit cost commands for state matching access lists. Perform this task to configure an access list to configure a state matching access list.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 access-list** *access-list-name*
4. Use one of the following:

> - **permit**
> - **deny**

DETAILED STEPS

Procedure

	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	**ipv6 access-list** *access-list-name* **Example:** `Device(config)# ipv6 access-list costlist1`	Defines an IPv6 access list and places the device in IPv6 access list configuration mode.

Step 4	Use one of the following:
	
	 - **permit**
	 - **deny**
	
	 Example:
	 `Device(config)# permit any ff03::1/64`
	 `Device(config_# deny any ff03::1/64`
		Sets conditions for an IPv6 access list.

Configuring the Interface Limit for Bandwidth-Based CAC in IPv6

Bandwidth-based CAC for IPv6 counts per-interface IPv6 mroute states using cost multipliers. With this feature, device administrators can specify which cost multiplier to use when accounting such state against the interface limits.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **configure terminal**
4. **interface** *type number*
5. **ipv6 address** [*ipv6-address* / *prefix-length* | *prefix-name sub-bits* / *prefix-length*]
6. **ipv6 multicast limit** [**connected** / **rpf** | **out**] *limit-acl max*

DETAILED STEPS

Procedure

	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	**configure terminal** **Example:** Device# configure terminal	Enters global configuration mode.
Step 4	**interface** *type number* **Example:** Device(config)# interface FastEthernet 1/3	Specifies an interface type and number, and places the device in interface configuration mode.
Step 5	**ipv6 address** [*ipv6-address* / *prefix-length*	*prefix-name sub-bits* / *prefix-length*] **Example:** Device(config-if)# ipv6 address FE80::40:1:3 link-local	Configures an IPv6 address based on an IPv6 general prefix.
Step 6	**ipv6 multicast limit** [**connected** / **rpf**	**out**] *limit-acl max* **Example:** Device(config-if)# ipv6 multicast limit out acl1 10	Configures per-interface mroute state limiters in IPv6.

Configuring the Threshold Notification for the mCAC Limit in IPv6

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 multicast limit rate** *rate-value*
4. **interface** *type number*
5. **ipv6 multicast limit** [**connected** | **rpf** | **out**] *limit-acl max* [**threshold** *threshold-value*]

DETAILED STEPS

Procedure

	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	**ipv6 multicast limit rate** *rate-value* **Example:** `Device(config)# ipv6 multicast limit rate 2`	Configures the maximum allowed state on the source device.
Step 4	**interface** *type number* **Example:** `Device(config)# interface GigabitEthernet 1/3/1`	Specifies an interface type and number, and places the device in interface configuration mode.
Step 5	**ipv6 multicast limit** [**connected** | **rpf** | **out**] *limit-acl max* [**threshold** *threshold-value*] **Example:** `Device (config-if)# ipv6 multicast limit out acl1 10 threshold 20`	Configures per-interface mroute state limiters in IPv6.

Configuration Examples for IPv6 Multicast Bandwidth-Based Call Admission Control

Example: Configuring the Global Limit for Bandwidth-Based CAC

The following example configures the global limit on the source device.

```
ipv6 multicast limit cost cost-list 2
```

Example: Configuring an Access List for Bandwidth-Based CAC in IPv6

The following example shows how to configure an access list to use for bandwidth-based CAC:

```
ipv6 access-list cost-list
   permit any ff03::1/64
```

Example: Configuring the Interface Limit for Bandwidth-Based CAC in IPv6

The following example configures the interface limit on the source device's outgoing interface Ethernet 1/3.

```
interface Ethernet1/3
ipv6 address FE80::40:1:3 link-local
 ipv6 address 2001:DB8:1:1:3/64
 ipv6 multicast limit out acl1 10
```

Additional References

Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	*IPv6 Configuration Guide*
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
IPv6 commands	*Cisco IOS IPv6 Command Reference*
Cisco IOS IPv6 features	Cisco IOS IPv6 Feature Mapping

Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	*IPv6 RFCs*

MIBs

MIB	MIBs Link
	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

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 IPv6 Multicast: Bandwidth-Based Call Admission Control

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 https://cfnng.cisco.com/. An account on Cisco.com is not required.

Table 1: Feature Information for IPv6 Multicast: Bandwidth-Based Call Admission Control

Feature Name	Releases	Feature Information
IPv6 Multicast: Bandwidth-Based Call Admission Control	12.2(40)SG 3.2.0SG 15.0(2)SG 12.2(33)SRE Cisco IOS XE Release 2.6 15.0(1)S	This feature can be used to provide bandwidth-based CAC on a per-interface basis in network environments where the multicast flows use different amounts of bandwidth. The following commands were introduced or modified: **ipv6 access-list**, **ipv6 address**, **ipv6 multicast limit**, **ipv6 multicast limit cost**.
mCAC enhancement: configurable treshold notification for mCAC limits	Cisco IOS XE Release 2.6	This feature enables system notifications when actual simultaneous multicast channel numbers exceeds or fall below some percentage (called threshold percantage). The following command were introduced or modified by this feature: **ipv6 multicast limit**, **ipv6 multicast limit rate**.