IP Multicast Bandwidth Adjustment for QoS Overview

You can associate the IP multicast bandwidth adjustment application (**ip-multicast**) with a parameter definition. Before you begin, you must define a multicast bandwidth map and the QoS adjustment for a virtual router.

You use the IP multicast bandwidth adjustment application to set the shared-shaping rate for a subscriber when a downstream DSLAM is replicating a multicast frame for multiple downstream transmissions on a subscriber circuit. In this case, the router does not schedule the multicast traffic on a subscriber VLAN, but limits the scheduled non-multicast traffic on the subscriber VLAN so that the total of non-multicast and multicast traffic at the DSLAM is less than the subscriber shared-shaping rate.

To implement this, the IP multicast bandwidth adjustment application tracks the bandwidth of multicast flows based on IGMP joins and leaves. When the QoS administrator configures a QoS parameter with the IP multicast bandwidth adjustment application, the application automatically configures an instance of that parameter for each subscriber that is receiving multicast traffic. The value of the parameter instance is equal to the multicast bandwidth for a subscriber at a specific time. The shared-shaping rate of the VLAN node can be configured using a parameter expression such as max-subscriber-bandwidth - ip-multicast-bandwidth.

In a typical IP multicast bandwidth adjustment configuration, the shaping rate or shared-shaping rate is determined by calculating the total subscriber bandwidth of the logical interface minus the ip-multicast bandwidth. To enable the IP multicast QoS adjustment, you must:

- Define a qos-parameter using the **qos-parameter-define** command with the application **ip-multicast** and the **hierarchical** keyword.

  ```
  host1(config)# qos-parameter-define ipm application ip-multicast hierarchical
  host1(config-qos-parameter-define)#
  ```

- Reference the ipm parameter within a scheduler profile. For example:

  ```
  host1(config)#scheduler-profile totalSubscriberBw
  host1(config-scheduler-profile)#shared-shaping-rate 10000000 - ipm auto
  ```

  This scheduler profile contains an expression for the shared-shaping rate that limits the shared-shaping rate to 10 Mbps less the rate of any IP multicast traffic.

- Reference the scheduler profile within a QoS profile rule. For example:

  ```
  host1(config)#qos-profile subscriber
  host1(config-qos-profile)#vlan node scheduler-profile totalSubscriberBw
  ```

  This QoS profile rule limits a subscriber with vlan to the rate specified in the totalSubscriberBw scheduler profile.

QoS clients do not need to create a parameter instance to activate the IP multicast bandwidth adjustment application. The system automatically creates explicit instances based on IGMP joins and leaves.

When a subscriber logs in, the QoS scheduler hierarchy is created with the vlan configured for shared shaping, based on the expression 1000000 - ipm. If no multicast traffic is being transmitted, there is no ipm parameter instance with the vlan.

To calculate the subscriber bandwidth from the total subscriber bandwidth, you must create a global parameter instance using the **ip-multicast** keyword and set the value to 0.

To ensure the system can locate an instance of the ipm parameter for subscribers that are not receiving multicast traffic, you must create a global parameter with a value of 0:

```
host1(config)# qos-parameter ipm 0
```

If you do not create the global parameter instance, the expression result is undefined for these subscribers and the shared shaping rate is not set.

By configuring a global parameter instance of 0, the value is applied to all the interfaces that reference the parameter. QoS overrides the global ipm parameter instance with the value specified in the bandwidth map for a specific IP interface on which IGMP joins.

Related Topics

- Guidelines for Configuring IP Multicast Adjustment for QoS
- For more information about multicast bandwidth maps and QoS adjustment, see *JUNOSe Multicast Routing Configuration Guide*
- For more information about configuring scheduler rates for QoS parameters, see Scheduler Profiles and Parameter Expressions for QoS Administrators

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