

## Constituent Selection for Shared Shaping Overview

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Shared shaping supports both *implicit* and *explicit* constituent selection. Implicit constituent selection is the easier of the two methods and works well for most cases. With implicit selection, you configure a shared-shaping rate on the best-effort node or queue and QoS locates the other constituents automatically.

Use explicit constituent selection when you want to shape a subset of the interface traffic to the shared rate. An example of this is when you want the sum of best-effort and voice traffic to be shaped to the shared rate, but want video traffic to be exempt from the shared-shaping rate.

Active constituents are selected either implicitly by QoS or explicitly by the user. Active constituents of the simple shared shaper can be any node and queues in named traffic-class groups. Active constituents of the compound shared shaper can be nodes or queues. If you choose a node as an active constituent, queues above it are not active constituents.

Inactive constituents are queues that are stacked above an active node or nodes stacked below active queues. For both of these situations, the shared shaper controls the active constituents, and the legacy scheduler indirectly controls the inactive constituents to achieve the shared rate. The other case for inactive constituents is when you use explicit constituent selection and some of the nodes and queues are explicitly not included in the shared shaper.

To use implicit constituent selection, you specify only the shared-shaping rate and the logical interface. The router identifies the constituents associated with the logical interface type and their allocated bandwidth. This method is appropriate for the typical case where the intent is to shape all subscriber queues to the shared rate.

If you want instead to shape a subset of the queues for a subscriber to the shared rate, the explicit selection process is appropriate. Explicit selection is also useful when you want queues as the active constituents instead of the node below them. By choosing queues you can assign appropriate priority or weights.

### Types of Shared Shaper Constituents

The **shared-shaping-constituent** command in a scheduler profile specifies constituents and their attributes. The command has two aspects. For explicit constituent selection, this command specifies the constituents. For the compound shared shaper only, this command specifies scheduling attributes of shared shaping: the shared priority and the shared weight.

A shared shaper can be one of the following four types:

- Simple implicit—Constituents are best-effort node or queues, and all nodes and queues in named traffic-class groups.
- Simple explicit—The software selects constituents based on the **shared-shaping-constituent** command. The weight and priority attributes of the **shared-shaping-constituent** command are ignored, because the simple

shared shaper does not allocate bandwidth among constituents; instead it controls just the best-effort queue or node.

- Compound implicit—Constituents are selected automatically by the software. If a node exists in a given traffic-class group, the node is active and the queues stacked above it are inactive constituents. The **shared-shaping-constituent** command does not affect constituent selection. However, if the command is present for a constituent that was implicitly selected, the software configures that constituent with the shared priority and shared weight as indicated.
- Compound explicit—The software selects constituents based on the shared priority and shared weight configured with the **shared-shaping-constituent** command. If no attributes are specified, the software supplies a shared priority consistent with the legacy scheduler configuration.

Table 1 compares implicit and explicit shared shaping.

**Table 1: Comparison of Implicit and Explicit Shared Shaping**

Implicit Shared Shaping	Explicit Shared Shaping
<ul style="list-style-type: none"> <li>■ To specify the logical interface for shared shaping, associate a scheduler profile that includes the <b>shared-shaping-rate</b> command or the <b>shared-shaping-rate simple</b> command with a best-effort node or queue.</li> </ul>	<ul style="list-style-type: none"> <li>■ To specify the logical interface for shared shaping, associate a scheduler profile that includes the <b>shared-shaping-rate rate explicit-constituents</b> command or the <b>shared-shaping-rate rate simple explicit-constituents</b> command with a best-effort node or queue.</li> </ul>
<ul style="list-style-type: none"> <li>■ Constituents consist of all nodes and queues for the same logical interface type.</li> </ul>	<ul style="list-style-type: none"> <li>■ Constituents consist of all nodes and queues for the same logical interface type.</li> </ul>
<ul style="list-style-type: none"> <li>■ Active constituents are automatically selected from all constituents according to the implicit shared shaping rules.</li> </ul>	<ul style="list-style-type: none"> <li>■ Active constituents are explicitly selected from all constituents by association with a scheduler profile that includes the <b>shared-shaper-constituent</b> command.</li> <li>■ If the scheduler profile associated with a constituent does not include this command, then the constituent is not active and is not shaped by the shared shaper.</li> </ul>

#### Related Topics

- Implicit Constituent Selection Overview
- Configuring Implicit Constituents for Simple or Compound Shared Shaping
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