Configuring Priority Queuing

This chapter describes how to configure the QoS priority queuing feature on the Cisco 1000 Series Connected Grid Router (hereafter referred to as the Cisco CG-OS router). This chapter includes the following sections:

- Information About Priority Queuing, page 5-1
- Prerequisites for Priority Queuing, page 5-3
- Guidelines and Limitations, page 5-3
- Configuring Priority Queuing, page 5-3
- Verifying the Priority Queuing Configuration, page 5-5

Information About Priority Queuing

The Cisco CG-OS router employs priority queuing to manage the flow of traffic within the network and to achieve throughput and latency targets. Priority queuing employs index values, which you assign to class-maps to determine the order in which the Cisco CG-OS router forwards the associated packets.

You can only assign priority queue indexes to Layer 3 interfaces that are QoS classified or marked. Table 5-1 lists the Layer 3 interfaces supported on the Cisco CG-OS router.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Configuration Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Software configuration details can be seen in this and other Cisco 1000 Series Connected Grid Routers Software Configuration documents. For hardware details, see Cisco 1240 Connected Grid Router Hardware Installation Guide</td>
</tr>
<tr>
<td>Cellular interface (CDMA)</td>
<td>Software configuration details can be seen in this and other Cisco 1000 Series Connected Grid Routers Software Configuration documents. For hardware details, see Cisco Connected Grid Module–3G EVDO Rev A/0/1xRTT Installation and Configuration Guide</td>
</tr>
</tbody>
</table>

Table 5-1 Layer 3 Interfaces Which Support Priority Queuing
Information About Priority Queuing

Priority Queuing

The Cisco CG-OS router supports four priority queue settings for QoS, indexes 1 to 4, where 1 is the highest priority and 4 is the lowest. The Cisco CG-OS router sends outgoing traffic for each Layer 3 interface (see Table 5-1) based on its assigned priority queue index (see Table 5-2). You can assign these priority queue levels to traffic classes (class maps) to manage the sequencing of packets to yield a more consistent flow of traffic within the network.

For example, the Cisco CG-OS router forwards all outgoing traffic with a priority queue index of one, the highest priority setting, before forwarding any outgoing traffic with a priority queue index of 2. Likewise, the Cisco CG-OS router forwards all traffic with a priority queue index of 2 before traffic with a priority queue index of 3. This pattern continues until the Cisco CG-OS router forwards traffic from the lowest priority queue (4), which has an index of 4.

When the queue buffer overloads, the Cisco CG-OS router drops packets.

Table 5-2  Priority Queue Indexes

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Highest priority.</strong> Traffic assigned this value, is always sent first.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Medium Priority.</strong> Traffic assigned this value is sent after priority 1 traffic and before traffic with assigned priority of 3 or 4.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Best Effort Priority.</strong> Traffic assigned this value is sent after priority 1 and 2 traffic and before traffic with assigned priority of 4. <strong>Note</strong> Default setting.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Lowest priority.</strong> Traffic assigned this value is always sent after those packets in the queue with priority of 1, 2, or 3 are sent.</td>
</tr>
</tbody>
</table>
Prerequisites for Priority Queuing

You must be familiar with Chapter 2, “Using Modular QoS CLI.”
You are logged on to the Cisco CG-OS router.

Guidelines and Limitations

Configure system-defined class maps with care because the changes occur immediately and traffic might be disrupted.

Configuring Priority Queuing

You configure priority queuing by creating policy maps of type qos that you can apply to outgoing (egress) traffic on an interface. You can modify system-defined class maps, which are used in policy maps to define classes of traffic to which you want to apply policies. For information about configuring policy maps and class maps, see Chapter 2, “Using Modular QoS CLI.”

This section includes the following topics:
- Configuring Priority Queuing, page 5-3
- Assigning Priority Queues to Layer 3 Interfaces, page 5-4

Configuring Priority Queuing

BEFORE YOU BEGIN

Configure the policy map. See Configuring or Modifying a Policy Map, page 2-3.
Configure the class map. See Configuring or Modifying a Class Map, page 2-2.

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>configure terminal</td>
</tr>
<tr>
<td>Step 2</td>
<td>policy-map type qos policy-map-name</td>
</tr>
</tbody>
</table>
### Configuring Priority Queuing

**Example**

This example shows how to configure a priority queue index of 2 for the type qos class map, `priority_queuing2`:

```plaintext
router# configure terminal
router(config)# policy-map type qos priority_queuing2
router(config-pmap-qos)# class type_queuing
router(config-pmap-c-qos)# priority level 2
router(config-pmap-c-qos)# copy running-config startup-config
```

### Assigning Priority Queues to Layer 3 Interfaces

You can assign a priority queue index to Layer 3 interfaces. Table 5-1 lists supported interfaces.

**Before You Begin**

Configure the priority queue. See Configuring Priority Queuing, page 5-3.

**Detailed Steps**

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 3</strong></td>
<td><code>class class-map-name</code></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td><code>priority [level n]</code></td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td><code>show policy-map type qos [policy-map-name]</code></td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td><code>copy running-config startup-config</code></td>
</tr>
</tbody>
</table>
EXAMPLE

This example shows how to configure a priority queue of level 2 for a specific queue:

```
router# configure terminal
router(config)# interface cellular 3/1
router(config-if)# service-policy output priority_queuing2
router(config-if)# copy running-config startup-config
```

Note

For details on how to view QoS statistics on the interfaces, see Chapter 6, “Monitoring QoS Statistics.”

Verifying the Priority Queuing Configuration

To verify the QoS priority queuing configuration, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>show policy-map type qos [policy-map-name]</td>
<td>(Optional) Displays information about all configured policy maps or a selected policy map of type qos.</td>
</tr>
</tbody>
</table>
Verifying the Priority Queuing Configuration