



# CHAPTER 5

## 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 5-1** Layer 3 Interfaces Which Support Priority Queuing

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

**Table 5-1 Layer 3 Interfaces Which Support Priority Queuing (continued)**

Interface	Configuration Details
Cellular interface (GSM)	Software configuration details can be seen in this and other Cisco 1000 Series Connected Grid Routers Software Configuration documents. For hardware details, see <i>Cisco Connected Grid Module–3G HSPA+/UMTS/GSM/GPRS/EDGE Installation and Configuration Guide</i>
WiMax interface	Software configuration details can be seen in this and other Cisco 1000 Series Connected Grid Routers Software Configuration documents. For hardware details, see <i>Cisco Connected Grid Modules for CGR 1000 Series–WiMAX Installation and Configuration Guide</i>

## 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**

Value	Description
1	<b>Highest priority.</b> Traffic assigned this value, is always sent first.
2	<b>Medium Priority.</b> Traffic assigned this value is sent after priority 1 traffic and before traffic with assigned priority of 3 or 4.
3	<b>Best Effort Priority.</b> Traffic assigned this value is sent after priority 1 and 2 traffic and before traffic with assigned priority of 4. <b>Note</b> Default setting.
4	<b>Lowest priority.</b> Traffic assigned this value is always sent after those packets in the queue with priority of 1, 2, or 3 are sent.

# 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

	Command	Purpose
Step 1	<code>configure terminal</code>	Enters configuration mode.
Step 2	<code>policy-map type qos <i>policy-map-name</i></code>	Configures the policy map and then enters policy-map mode for the policy-map name that you specify. Policy-map names can contain alphabetic, hyphen, or underscore characters, are case sensitive, and can be up to 40 characters.

	Command	Purpose
Step 3	<code>class class-map-name</code>	Configures the class map and then enters the class-map qos mode.
Step 4	<code>priority [level n]</code>	Sets the priority level (index) for the class map. Values are 1 to 4, highest priority to lowest priority. Default value is 3.
Step 5	<code>show policy-map type qos [policy-map-name]</code>	(Optional) Displays information about all configured policy maps or a selected policy map of type qos.
Step 6	<code>copy running-config startup-config</code>	(Optional) Saves the running configuration to the startup configuration.

## EXAMPLE

This example shows how to configure a priority queue index of 2 for the type qos class map, `priority_queueing2`:

```
router# configure terminal
router(config)# policy-map type qos priority_queueing2
router(config-pmap-qos)# class type_queueing
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

	Command	Purpose
Step 1	<code>configure terminal</code>	Enters configuration mode.
Step 2	<code>interface interface-name</code>	Enters the interface command mode.
Step 3	<code>service-policy [output] policy-map-name</code>	Applies this policy map to packets going out of this interface.
Step 4	<code>show policy-map type qos [policy-map-name]</code>	(Optional) Displays information about all configured policy maps or a selected policy map of type qos.
Step 5	<code>copy running-config startup-config</code>	(Optional) Saves the running configuration to the startup configuration.

**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_queueing2
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:

Command	Purpose
<code>show policy-map type qos</code> <i>[policy-map-name]</i>	(Optional) Displays information about all configured policy maps or a selected policy map of type qos.

