

Configuring Custom Queueing

This chapter describes the tasks for configuring QoS custom queueing on a router. For a complete description of the commands mentioned in this chapter, refer to the *Quality of Service Solutions Command Reference*; the commands are listed alphabetically within that guide. To locate documentation of specific commands, use the command reference, master index, or search online.

Note Custom queueing is not supported on any tunnels.

Custom Queueing Configuration Task List

You must follow certain required, basic steps to enable custom queueing for your network. In addition, you can choose to assign packets to custom queues based on protocol type, interface where the packets enter the router, or other criteria you specify. The following sections outline these tasks:

- Define the Custom Queue List
- Specify the Maximum Size of the Custom Queues
- Assign Packets to Custom Queues
- Monitor Custom Queue Lists

See the section “Custom Queueing Configuration Examples” later in this chapter for ideas of how to configure custom queueing on your network.

Define the Custom Queue List

To assign a custom queue list to an interface, use the following commands:

Step	Command	Purpose
1	interface <i>interface-type</i> <i>interface-number</i>	Specify the interface, and then enter interface configuration mode.
2	custom-queue-list <i>list</i>	Assign a custom queue list to the interface. The list argument is any number from 1 to 16. There is no default assignment.

Note Use the **custom-queue-list** command in place of the **priority-list** command. Only one queue list can be assigned per interface.

Custom queueing allows a fairness not provided with priority queueing. With custom queueing, you can control the interface's available bandwidth when it is unable to accommodate the aggregate traffic enqueued. Associated with each output queue is a configurable byte count, which specifies how many bytes of data should be delivered from the current queue by the system before the system moves on to the next queue. When a particular queue is being processed, packets are sent until the number of bytes sent exceeds the queue byte count defined by the **queue-list queue byte-count** command (see the section "Specify the Maximum Size of the Custom Queues"), or until the queue is empty.

Specify the Maximum Size of the Custom Queues

You can specify the maximum number of packets allowed in each of the custom queues. The default is 20 entries.

You can also specify the approximate number of bytes to be forwarded from each queue during its turn in the cycle. The number is used by the system as an average number because whole packets must be forwarded.

To specify the approximate number of bytes to be forwarded from each queue during its turn in the cycle, use one of the following commands in global configuration mode:

Command	Purpose
queue-list <i>list-number</i> queue <i>queue-number</i> limit <i>limit-number</i>	Specifies the maximum number of packets allowed in each of the custom queues. The <i>limit-number</i> argument specifies the number of packets that can be enqueued at any one time. The range is 0 to 32767.
queue-list <i>list-number</i> queue <i>queue-number</i> byte-count <i>byte-count-number</i>	Designates the average number of bytes forwarded per queue. The <i>byte-count-number</i> argument specifies the average number of bytes the system allows to be delivered from a given queue during a particular cycle.

Assign Packets to Custom Queues

You can assign packets to custom queues based on the protocol type or interface where the packets enter the router. Additionally, you can set the default queue for packets that do not match other assignment rules. You can also specify multiple rules.

To define the custom queueing lists, use one of the following commands in global configuration mode:

Command	Purpose
queue-list <i>list-number</i> protocol <i>protocol-name</i> <i>queue-number</i> <i>queue-keyword</i> <i>keyword-value</i>	Establish queueing priorities based upon the protocol type.
queue-list <i>list-number</i> interface <i>interface-type</i> <i>interface-number</i> <i>queue-number</i>	Establish custom queueing based on packets entering from a given interface.
queue-list <i>list-number</i> default <i>queue-number</i>	Assign a queue number for those packets that do not match any other rule in the custom queue list.

All protocols supported by Cisco are allowed. The *queue-keyword* variable provides additional options, including byte count, Transmission Control Protocol (TCP) service and port number assignments, and AppleTalk, IP, IPX, VINES, or XNS access list assignments. See the **queue-list protocol** command syntax description in the *Quality of Service Solutions Command Reference*.

When you use multiple rules, remember that the system reads the **queue-list** commands in order of appearance. When classifying a packet, the system searches the list of rules specified by **queue-list** commands for a matching protocol or interface type. When a match is found, the packet is assigned to the appropriate queue. The list is searched in the order it is specified, and the first matching rule terminates the search.

Monitor Custom Queue Lists

To show information about the input and output queues when custom queueing is enabled on an interface, use one of the following commands in EXEC mode:

Command	Purpose
show queueing custom	Show the status of the custom queueing lists.
show interface <i>interface-type interface-number</i>	Show the current status of the custom output queues when custom queueing is enabled.

Custom Queueing Configuration Examples

The following sections provide examples of ways you might configure QoS custom queueing to control traffic in your network

- Define the Custom Queue List Example
- Specify Maximum Size of Custom Queues Examples
- Assign by Protocol Type Examples
- Assign by Interface Type Example
- Assign by Default Queue Example

Define the Custom Queue List Example

This example illustrates how to assign custom queue list number 3 to serial interface 0:

```
interface serial 0
 custom-queue-list 3
```

Specify Maximum Size of Custom Queues Examples

The following example specifies the maximum number of packets allowed in each custom queue. The queue length of queue 10 is increased from the default 20 packets to 40 packets:

```
queue-list 3 queue 10 limit 40
```

The queue length limit is the maximum number of packets that can be enqueued at any time, with the range being 0 to 32767 queue entries.

The following example decreases queue list 9 from the default byte count of 1500 to 1400 for queue number 10:

```
queue-list 9 queue 10 byte-count 1400
```

The byte count establishes the lowest number of bytes the system allows to be delivered from a given queue during a particular cycle.

Assign by Protocol Type Examples

This example assigns traffic that matches IP access list 10 to queue number 1:

```
queue-list 1 protocol ip 1 list 10
```

This example assigns Telnet packets to queue number 2:

```
queue-list 4 protocol ip 2 tcp 23
```

This example assigns UDP Domain Name Service packets to queue number 3:

```
queue-list 4 protocol ip 3 udp 53
```

Assign by Interface Type Example

In this example, queue list 4 establishes queuing priorities for packets entering on serial interface 0. The queue number assigned is 10.

```
queue-list 4 interface serial 0 10
```

You can define multiple rules; the system reads the priority settings in order of appearance. The system searches the list in the order it is specified, and the first matching rule terminates the search. When a match is found, the packet is assigned to the appropriate queue.

Assign by Default Queue Example

You can specify a default queue for packets that do not match other assignment rules. In this example, the default queue for list 10 is set to queue number 2.

```
queue-list 10 default 2
```