

# Configuring Priority Queueing

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This chapter describes the tasks for configuring priority 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.

## Priority Queueing Configuration Task List

You must follow certain required, basic steps to enable priority queueing in your network. The following sections outline these tasks:

- Define the Priority List
- Assign the Priority List to an Interface
- Monitor Priority Queueing Lists

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

## Define the Priority List

A priority list contains the definitions for a set of priority queues. The priority list specifies which queue a packet will be placed in and, optionally, the maximum length of the different queues.

In order to perform queueing using a priority list, you must assign the list to an interface. The same priority list can be applied to multiple interfaces. Alternatively, you can create many different priority policies to apply to different interfaces.

To define a priority list, perform the tasks in the following sections. The second task is optional.

- Assign Packets to Priority Queues
- Specify the Maximum Size of the Priority Queues

## Assign Packets to Priority Queues

Assign packets to priority queues based on the following:

- Protocol type
- Interface where the packets enter the router

You can specify multiple assignment rules. The **priority-list** commands are read in order of appearance until a matching protocol or interface type is found. When a match is found, the packet is assigned to the appropriate queue and the search ends. Packets that do not match other assignment rules are assigned to the default queue.

To specify which queue to place a packet in, use the following commands in global configuration mode:

Step	Command	Purpose
1	<b>priority-list</b> <i>list-number</i> <b>protocol</b> <i>protocol-name</i> { <b>high</b>   <b>medium</b>   <b>normal</b>   <b>low</b> } <i>queue-keyword</i> <i>keyword-value</i>	Establish queueing priorities based upon the protocol type.
2	<b>priority-list</b> <i>list-number</i> <b>interface</b> <i>interface-type</i> <i>interface-number</i> { <b>high</b>   <b>medium</b>   <b>normal</b>   <b>low</b> }	Establish queueing priorities for packets entering from a given interface.
3	<b>priority-list</b> <i>list-number</i> <b>default</b> { <b>high</b>   <b>medium</b>   <b>normal</b>   <b>low</b> }	Assign a priority queue for those packets that do not match any other rule in the priority 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.

## Specify the Maximum Size of the Priority Queues

You can specify the maximum number of packets allowed in each of the priority queues. Perform this task for each priority list.

To do so, use the following command in global configuration mode:

Command	Purpose
<b>priority-list</b> <i>list-number</i> <b>queue-limit</b> [ <i>high-limit</i> [ <i>medium-limit</i> [ <i>normal-limit</i> [ <i>low-limit</i> ]]]]	Specify the maximum number of packets allowed in each of the priority queues.

The default queue limit arguments are listed in Table 7.

**Table 7** Default Priority Queue Packet Limits

Priority Queue Argument	Packet Limits
high-limit	20
medium-limit	40
normal-limit	60
low-limit	80

## Assign the Priority List to an Interface

You can assign a priority list number to an interface. Only one list can be assigned per interface. To assign a priority group to an interface, use the following commands:

Step	Command	Purpose
1	<b>interface</b> <i>interface-type interface-number</i>	Specify the interface, and then enter interface configuration mode.
2	<b>priority-group</b> <i>list-number</i>	Assign a priority list number to the interface.

## Monitor Priority Queueing Lists

To display information about the input and output queues, use the following command in EXEC mode:

Command	Purpose
<b>show queueing priority</b>	Show the status of the priority queueing lists.

## Priority Queueing Configuration Examples

This section provides examples of priority queueing configurations. It includes the following examples:

- Priority Queueing Based on Protocol Type Example
- Priority Queueing Based on Interface Example
- Specify the Maximum Size of the Priority Queue Example
- Assign Priority List to an Interface Example
- Priority Queueing Using Multiple Rules Example

### Priority Queueing Based on Protocol Type Example

This example establishes queueing based on protocol type. The example assigns 1 as the arbitrary priority list number, specifies IP as the protocol type, and assigns a high priority level to traffic that matches IP access list 10.

```
access-list 10 permit 239.1.1.0 0.0.0.255
priority-list 1 protocol ip high list 10
```

### Priority Queueing Based on Interface Example

This example establishes queueing based on interface. The example sets any packet type entering on Ethernet interface 0 to a medium priority.

```
priority-list 3 interface ethernet 0 medium
```

### Specify the Maximum Size of the Priority Queue Example

This example changes the maximum number of packets in the high priority queue to 10. The medium-, normal, and low-limit queue sizes remain at their default 40-, 60-, and 80-packet limits.

```
priority-list 4 queue-limit 10 40 60 80
```

### Assign Priority List to an Interface Example

This example assigns priority group list 4 to serial interface 0:

```
interface serial 0
  priority-group 4
```

### Priority Queueing Using Multiple Rules Example

When classifying a packet, the system searches the list of rules specified by **priority-list** commands for a matching protocol type. The following example specifies four rules:

- DECnet packets with a byte count less than 200 are assigned a medium priority queue level.
- IP packets originating or destined to TCP port 23 are assigned a medium priority queue level.
- IP packets originating or destined to User Datagram Protocol (UDP) port 53 are assigned a medium priority queue level.
- All IP packets are assigned a high priority queue level.

Remember that when using multiple rules for a single protocol, the system reads the priority settings in the order of appearance.

```
priority-list 4 protocol decnet medium lt 200
priority-list 4 protocol ip medium tcp 23
priority-list 4 protocol ip medium udp 53
priority-list 4 protocol ip high
```