



# Configuring Priority Queueing

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This module describes the tasks for configuring priority queueing (PQ) on a router.

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

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## Priority Queueing Configuration

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.

Assign packets to priority queues based on the following qualities:

- 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



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appropriate queue and the search ends. Packets that do not match other assignment rules are assigned to the default queue.

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## Defining the Priority List

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## Assigning Packets to Priority Queues

### SUMMARY STEPS

1. Router(config)# **priority-list***list-number* **protocol** *protocol-name*{**high** | **medium** | **normal** | **low**}*queue-keyword keyword-value*
2. Router(config)# **priority-list** *list-number* **interface** *interface-type interface-number*{**high** | **medium** | **normal**| **low**}
3. Router(config)# **priority-list** *list-number* **default**{**high** | **medium** | **normal**| **low**}

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	Router(config)# <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 keyword-value</i>	Establishes queueing priorities based on the protocol type.  <b>Note</b> All protocols supported by Cisco are allowed. The <i>queue-keyword</i> argument provides additional options including byte count, TCP service and port number assignments, and AppleTalk, IP, IPX, VINES, or XNS access list assignments. Refer to the <b>priority-list protocol</b> command syntax description in the Cisco IOS Quality of Service Solutions Command Reference.
<b>Step 2</b>	Router(config)# <b>priority-list</b> <i>list-number</i> <b>interface</b> <i>interface-type interface-number</i> { <b>high</b>   <b>medium</b>   <b>normal</b>   <b>low</b> }	Establishes queueing priorities for packets entering from a given interface.
<b>Step 3</b>	Router(config)# <b>priority-list</b> <i>list-number</i> <b>default</b> { <b>high</b>   <b>medium</b>   <b>normal</b>   <b>low</b> }	Assigns a priority queue for those packets that do not match any other rule in the priority list.

## Specifying the Maximum Size of the Priority Queues

Command	Purpose
<pre>Router(config)# <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>]]]</pre>	<p>Specifies the maximum number of packets allowed in each of the priority queues:</p> <ul style="list-style-type: none"> <li>• high-limit--20</li> <li>• medium-limit--40</li> <li>• normal-limit--60</li> <li>• low-limit--80</li> </ul>

## Assigning the Priority List to an Interface

### SUMMARY STEPS

1. Router(config)# **interface** *interface-type interface-number*
2. Router(config-if)# **priority-group** *list-number*

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	Router(config)# <b>interface</b> <i>interface-type interface-number</i>	Specifies the interface, and then enters interface configuration mode.
<b>Step 2</b>	Router(config-if)# <b>priority-group</b> <i>list-number</i>	Assigns a priority list number to the interface.

## Monitoring Priority Queueing Lists

Command	Purpose
<pre>Router# <b>show queue</b> <i>interface-type interface-number</i></pre>	Displays the contents of packets inside a queue for a particular interface or VC.
<pre>Router# <b>show queueing priority</b></pre>	Displays the status of the priority queueing lists.

## Priority Queueing Configuration Examples

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## Example Priority Queueing Based on Protocol Type

The following 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
```

## Example Priority Queueing Based on Interface

The following 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
```

## Example Maximum Specified Size of the Priority Queue

The following example changes the maximum number of packets in the high priority queue to 10. The medium-limit, 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
```

## Example Priority List Assigned to an Interface

The following example assigns priority group list 4 to serial interface 0:

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



### Note

The **priority-group** *list-number* command is not available on ATM interfaces that do not support fancy queueing.

## Example Priority Queueing Using Multiple Rules

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
```

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