Configuring Priority Queueing

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

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 device

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.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and 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 module.

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

How to Configure Priority Queueing

Defining the Priority List

Assigning Packets to Priority Queues

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **priority-list** *list-number* **protocol** *protocol-name* {**high** | **medium** | **normal** | **low**} *queue-keyword keyword-value*
4. **priority-list** *list-number* **interface** *interface-type interface-number* {**high** | **medium** | **normal**| **low**}
5. **priority-list** *list-number* **default** {**high** | **medium** | **normal** | **low**}
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**priority-list** *list-number* **protocol** *protocol-name* {**high** | **medium** | **normal** | **low**} *queue-keyword keyword-value* **Example:** `Device(config)# priority-list 1 protocol ip high list 10`	Establishes queueing priorities based on the protocol type. **Note** All protocols supported by Cisco are allowed. The *queue-keyword* 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 **priority-list protocol** command syntax description in the *Cisco IOS Quality of Service Solutions Command Reference*.

	Command or Action	Purpose
Step 4	**priority-list** *list-number* **interface** *interface-type interface-number* {**high** | **medium** | **normal**| **low**} **Example:** `Device(config)# priority-list 3 interface ethernet 0 medium`	Establishes queueing priorities for packets entering from a given interface.
Step 5	**priority-list** *list-number* **default** {**high** | **medium** | **normal** | **low**} **Example:** `Device(config)# priority-list 3 default high`	Assigns a priority queue for those packets that do not match any other rule in the priority list.
Step 6	**end** **Example:** `Device(config)# end`	Exits global configuration mode and returns to privileged EXEC mode.

Specifying the Maximum Size of the Priority Queues

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **priority-list**
4. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**priority-list** **Example:** `Device(config)# policy-list`	Specifies the maximum number of packets allowed in each of the priority queues: • high-limit--20 • medium-limit--40 • normal-limit--60 • low-limit--80
Step 4	**end** **Example:** `Device(config)# end`	(Optional) Exits global configuration mode.

Assigning the Priority List to an Interface

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *interface-type interface-number*
4. **priority-group** *list-numbe*r
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**interface** *interface-type interface-number* **Example:** `Device(config)# interface ethernet 0`	Specifies the interface, and then enters interface configuration mode.
Step 4	**priority-group** *list-numbe*r **Example:** `Device(config-if)# priority-group 3`	Assigns a priority list number to the interface.
Step 5	**end** **Example:** `Device(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode.

Monitoring Priority Queueing Lists

SUMMARY STEPS

1. **enable**
2. **show queue interface-type interface-number**
3. **show queueing priority**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show queue interface-type interface-number** **Example:** `Device# show queue interface-type interface-number`	Displays the contents of packets inside a queue for a particular interface or VC.

	Command or Action	Purpose
Step 3	**show queueing priority** **Example:** `Device# show queueing priority`	Displays the status of the priority queueing lists.

Configuration Examples for Priority Queueing

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
```

Additional References for Configuring Priority Queueing

Related Documents

Related Topic	Document Title
Cisco commands	Cisco IOS Master Commands List, All Releases
QoS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	*Cisco IOS Quality of Service Solutions Command Reference*

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Configuring Priority Queueing

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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Table 1: Feature Information for Configuring Priority Queueing

Feature Name	Releases	Feature Information
Priority Queueing (PQ)	11.2(1) 12.2(27)SBB 12.2(33)XNA Cisco IOS XE Release 3.2SE	The Priority Queueing (PQ) feature allows you to configure priority queueing on a device with the use of priority lists. The following commands were introduced or modified by this feature: **priority-group**, **priority list default**, **priority list interface**, **priority list protocol**, **priority list queue-limit**, **show queue**, **show queueing priority**.