



## Configuring Traffic Management

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Fibre Channel Congestion Control (FCC) is a Cisco proprietary flow control mechanism that alleviates congestion on Fibre Channel networks.

Quality of service (QoS) offers the following advantages:

- Guarantees absolute and relative bandwidth choices
- Provides latency to reduce frame loss
- Prioritizes transactional traffic over bulk traffic
- Supports multiple VSANs on the same fabric by guaranteeing bandwidth and latency available to each VSAN

This chapter provides details on the QoS and FCC features provided in all switches. It includes the following sections:

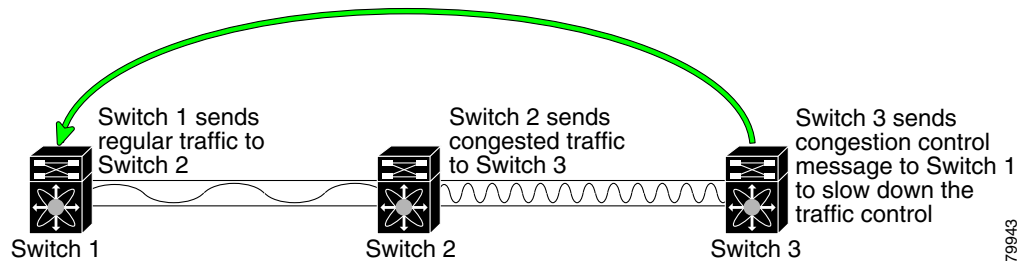
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## FCC

FCC reduces the congestion in the fabric without interfering with the standard Fibre Channel protocols. The FCC protocol increases the granularity and the scale of congestion control applied to any class of traffic (see [Figure 19-1](#)).

**Figure 19-1 FCC Mechanisms**



Edge quench congestion control provides feedback to the source about the rate at which frames should be injected into the network (frame intervals).

## FCC Process

When a node in the network detects a congestion for an output port, it generates an edge quench message. These frames are identified by the Fibre Channel destination ID (DID) and the source ID. A switch from other vendors simply forwards these frames.

Any receiving switch in the Cisco MDS 9000 Family handles frames in one of these ways:

- It forwards the frame.
- It limits the rate of the frame flow in the congested port.

The behavior of the flow control mechanism differs based on the Fibre Channel DID:

- If the Fibre Channel DID is directly connected to one of the switch ports, the input rate limit is applied to that port.
- If the destination of the edge quest frame is a Cisco domain or the next hop is a Cisco MDS 9000 Family switch, the frame is forwarded.
- If neither of these mechanisms is true, then the frame is processed in the port going towards the FC DID.

All switches (including the edge switch) along the congested path process path quest frames. However, only the edge switch processes edge quest frames. The FCC protocol is implemented for each VSAN and can be enabled or disabled on a specified VSAN or for all VSANs at the same time.

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## Enabling FCC

By default, the FCC protocol is disabled. FCC can only be enabled globally for the entire switch.

To enable or disable the FCC feature, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b>	Enters configuration mode.
Step 2	switch(config)# <b>fcc</b>	Enables FCC globally.
	switch(config)# <b>no fcc</b>	Disables FCC globally.

## Assigning FCC Priority

To assign FCC priority, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b>	Enters configuration mode.
Step 2	switch(config)# <b>fcc priority 2</b>	Defines the FCC priority threshold with 0 being the lowest and 7 being the highest.

## Displaying FCC

Use the show fcc commands to view FCC settings (see [Example 19-1](#)).

### **Example 19-1 Displays Configured FCC Information**

```
switch# show fcc
fcc is disabled
fcc is applied to frames with priority up to 4
```

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## QoS



### Note

In Release 1, the QoS functionality provides control traffic over data traffic.

The Cisco MDS 9000 Family supports QoS for internally and externally generated control traffic. Within a switch, control traffic is sourced to the supervisor module and is treated as a high priority frame. A high priority status provides absolute priority over all other traffic and is assigned in the following cases:

- Internally generated time-critical control traffic (mostly Class F frames).
- Externally generated time-critical control traffic entering a switch in the Cisco MDS 9000 Family from a another vendor's switch. High priority frames originating from other vendor switches are marked as high priority as they enter a switch in the Cisco MDS 9000 Family.

## Enabling or Disabling Control Traffic

By default, the QoS feature for the control traffic is enabled (priority 0 is the default).

To disable the high priority assignment for control traffic, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b>	Enters configuration mode.
Step 2	switch(config)# <b>no qos control priority 0</b> switch(config)#	Disables the control traffic QoS feature.
Step 3	switch(config)# <b>qos control priority 0</b> switch(config)#	Enables the control traffic QoS feature.

## Displaying QoS Information

The **show qos** command displays the current QoS settings along with a the number of frames marked high priority. The count is only for debugging purposes and cannot be configured (see [Example 19-2](#)).

### Example 19-2 Displays Current QoS Settings

```
switch# show qos statistics
Total number of FC frames transmitted from the Supervisor= 15767
Number of highest-priority FC frames transmitted           = 8224
Current priority of FC control frames = 0      (0 = lowest; 7 = highest)
```

## Default FCC and QoS Settings

[Table 19-1](#) lists the default settings for FCC and QoS features:

**Table 19-1 Default FCC and QoS Settings**

Parameters	Default
FCC protocol	Disabled.
QoS control traffic	Enabled.