



## Priority Shaper

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Earlier, when the priority of a queue at Per-Hop Behavior (PHB) was propagated all the way up the hierarchy towards the channel level, the PHB classes that had priority at PHB level would only be prioritized over other classes of subchannels. To avoid this, Priority Shaper feature is implemented.

Priority Shaper feature helps to balance the packet drops between the streams when multiple streams egress out of a priority queue. Egress QoS policy is supported on Priority Shaper.

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## Restrictions for Priority Shaper

- Priority Shaper is supported only for PHB level classes.
- Egress QoS Policy map with Priority Shaper can be applied only on the member interface of port channel and not at the logical level.
- Policer configuration is not supported with the Priority Shaper configuration under same class map.
- Priority Traffic Latency is increased during congestion with Priority Shaper configuration at Q level. Configure the queue limit with a lesser value for the priority queue to reduce the latency of priority traffic.
- If the packet is from a 10G interface to a 1G interface, the bustiness is introduced. Due to this, dequeuing rate of this strict priority queue may be sometimes more than enqueueing. As a result, very few packet counters are seen in other queues.

## Configuring Priority Shaper

Perform the following steps to configure Priority Shaper.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **class-map** *class-map-name*
4. **match cos** *number*
5. **policy-map** *policy-map-name*
6. **class** *class-map-name*
7. **priority level** *<level 1/2>* **percent** *<percentage 1-100>* or **priority level** *<level 1/2>* *<kbps>* *<burst size>*
8. **interface** *interface-type interface-number*
9. **service-policy output** *policy-map-name*
10. **end**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>class-map</b> <i>class-map-name</i>  <b>Example:</b> Device(config)#class-map class_priority	Configures class map and specifies the name of the class map to be created.
<b>Step 4</b>	<b>match cos</b> <i>number</i>  <b>Example:</b> Device(config-cmap)# match cos 1	Matched different PHBs for different class maps.
<b>Step 5</b>	<b>policy-map</b> <i>policy-map-name</i>  <b>Example:</b> Device(config)#policy-map shape_priority	Configures the policy map.
<b>Step 6</b>	<b>class</b> <i>class-map-name</i>  <b>Example:</b> Device(config-pmap)#class class_priority	Specifies the name of the class whose policy you want to create and enters policy-map class configuration mode. This class is associated with the class map that is created earlier.
<b>Step 7</b>	<b>priority level</b> <i>&lt;level 1/2 &gt;</i> <b>percent</b> <i>&lt;percentage 1-100 &gt;</i> or <b>priority level</b> <i>&lt;level 1/2&gt;</i> <i>&lt;kbps&gt;</i> <i>&lt;burst size&gt;</i>	Assigns priority to a traffic class at the priority level specified.

	Command or Action	Purpose
	<b>Example:</b> Device(config-pmap-c)# priority <1-10000000> Kilo Bits per second Device(config-pmap-c)# priority Percent <1-100> Device(config-pmap-c)# priority level <1-2> <1-10000000> Kilo Bits per second Device(config-pmap-c)# priority level <1-2> percent <1-100>	<b>Note</b> <b>level</b> is the level of priority assigned to the priority class. Valid values are 1 (high priority) and 2 (low priority). The default value is 1. Do not specify the same priority level for two different classes in the same policy map.
<b>Step 8</b>	<b>interface</b> <i>interface-type interface-number</i>  <b>Example:</b> Device(config)# interface gigabitethernet 0/0/1	Specifies the port to attach to the policy map and allows to enter the interface configuration mode. Valid interfaces are physical ports.
<b>Step 9</b>	<b>service-policy output</b> <i>policy-map-name</i>  <b>Example:</b> Device(config-if)# service instance 1 ethernet Device(config-if-srv)# service-policy output shape_priority	Applies output policy to the interface. <b>Note</b> You can also attach the service policy over the service instance.
<b>Step 10</b>	<b>end</b>  <b>Example:</b> Device(config)#end	Returns to privileged EXEC mode.

## Configuration Examples for Priority Shaper

This section shows sample configurations for Priority Shaper.

### Example: Configuring Priority Shaper

The following is a sample configuration for ECMP load balancing.

```

Device(config)#class-map match-any class_level1
Device(config-cmap)#match cos 1
Device(config-cmap)#match cos 2
Device(config-cmap)#class-map match-any class_level2
Device(config-cmap)#match cos 3
Device(config-cmap)#match cos 4
Device(config-cmap)#class-map match-any class_bw
Device(config-cmap)#match cos 5
Device(config-cmap)#end

.
Device(config)#policy-map shape_priority
Device(config-pmap)#class class_level1
Device(config-pmap-c)#priority level 1 per 10
Device(config-pmap-c)#class class_level2
Device(config-pmap-c)#priority level 2 per 20
Device(config-pmap-c)#class class_bw
Device(config-pmap-c)#bandwidth remaining percent 70
Device(config-pmap-c)#end

```

```
Device(config)#interface GigabitEthernet0/0/3
Device(config-if)#load-interval 30
Device(config-if)#service-policy output shape_priority
Device(config-if)#end
```

**Note**

The match cos is *not* supported at egress on the Cisco RSP3 Module.

## Verifying Priority Shaper

Use the following command to verify that the Priority Shaper feature is configured on your interface.

```
Device# show policy-map interface TenGigabitEthernet0/0/2
show policy-map interface TenGigabitEthernet0/0/2
TenGigabitEthernet0/0/2

Service-policy output: shape_priority

queue stats for all priority classes:
Queueing
priority level 1
queue limit 3932 us/ 49152 bytes
(queue depth/total drops/no-buffer drops) 49476/44577300/0
(pkts output/bytes output) 2348138/1202246656

queue stats for all priority classes:
Queueing
priority level 2
queue limit 1966 us/ 49152 bytes
(queue depth/total drops/no-buffer drops) 51072/42228358/0
(pkts output/bytes output) 4697080/2404904960

Class-map: class_priority (match-any)
46925438 packets, 24025824256 bytes
30 second offered rate 1871849000 bps, drop rate 1778171000 bps
Match: cos 1
Match: cos 2
Priority: 10% (100000 kbps), burst bytes 2500000, b/w exceed drops: 44577300

Priority Level: 1

Class-map: class_priority level2 (match-any)
46925438 packets, 24025824256 bytes
30 second offered rate 1871849000 bps, drop rate 1684485000 bps
Match: cos 3
Match: cos 4
Priority: 20% (200000 kbps), burst bytes 5000000, b/w exceed drops: 42228358

Priority Level: 2

Class-map: class_bw (match-any)
23462719 packets, 12012912128 bytes
30 second offered rate 935925000 bps, drop rate 281045000 bps
Match: cos 5
Queueing
queue limit 393 us/ 49152 bytes
(queue depth/total drops/no-buffer drops) 49476/7045085/0
(pkts output/bytes output) 16417634/8405828608
bandwidth remaining 70%

Class-map: class-default (match-any)
0 packets, 0 bytes
30 second offered rate 0000 bps, drop rate 0000 bps
Match: any

queue limit 393 us/ 49152 bytes
```

```
(queue depth/total drops/no-buffer drops) 0/0/0  
(pkts output/bytes output) 0/0
```

