



QoS: Child Service Policy for Priority Class

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The QoS: Child Service Policy for Priority Class feature allows you to configure a child service policy with nonqueuing-based features and attach the child policy to a priority class.

History of QoS Child Service Policy for Priority Class

Release	Modification
12.2(31)SB2	This feature was introduced and implemented on the Cisco 10000 series router for the PRE3.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Prerequisites for QoS Child Service Policy for Priority Class

Traffic classes must be configured using the **class-map** command.

Restrictions for QoS Child Service Policy for Priority Class

The child policy that you attach to a priority class must be based on nonqueuing features. For example, if you attempt to do any of the following, an error message displays:

- Attach queuing-based child policy—You cannot attach a child service policy that is based on queuing features to a priority class. For example, you cannot attach a bandwidth-based child policy to a class with priority configured.
- Add queuing features to child policy—You cannot add queuing features (such as bandwidth) to a child policy that is already attached to a parent class with priority configured.
- Add priority to parent class—If a queuing-based child policy is already attached to a non-priority class of a parent policy, you cannot then configure the **priority** command for the parent class.

Information About QoS Child Service Policy for Priority Class

The QoS Child Service Policy for Priority Class feature allows you to configure a child service policy with nonqueuing-based features and attach the child policy to a priority class. In a three-level hierarchical policy, the priority class to which you attach the child policy must be in the middle-level policy. In a two-level hierarchical policy (nested policy), the priority class to which you attach the child policy is in the parent policy.

Prior to Cisco IOS Release 12.2(31)SB2, you could not attach a child service policy to a priority class even if the child policy contained nonqueuing-based commands. If you attempted to do so, an error message similar to the following displayed:

```
Please remove priority before attaching a child policy.
```

Priority Class of a Parent Policy

A parent policy contains traffic classes with various queuing and nonqueuing features enabled on the classes. You can give priority to a traffic class by configuring the **priority** command under the class. The router processes the packets belonging to the priority class before processing nonpriority classes.

Hierarchical Policies

A hierarchical policy is a quality of service (QoS) model that enables you to specify QoS behavior at multiple levels of hierarchy. Depending on the type of hierarchical policy you configure, you can use hierarchical policies to:

- Specify multiple policy maps to shape multiple queues together
- Apply specific policy map actions on the aggregate traffic
- Apply class-specific policy map actions

- Restrict the maximum bandwidth of a virtual circuit (VC) while allowing policing and marking of traffic classes within the VC

All hierarchical policy types consist of a top-level parent policy and one or more child policies. The **service-policy** command is used to apply a policy to another policy, and a policy to an interface, subinterface, virtual circuit (VC), or virtual LAN (VLAN).

How to Configure a Child Policy Under a Parent Priority Class

To configure a child policy under a parent priority class, perform the following configuration tasks:

- [Configuring a Child Policy Under a Priority Class, page 3](#)
- [Attaching a Hierarchical Service Policy to a Subinterface, page 5](#)

Configuring a Child Policy Under a Priority Class

Use the following procedure to configure a child policy under a priority class.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map** *policy-map-name*
4. **class** *class-map-name*
5. **police** [**cir**] *bps* [**bc**] *burst-normal* [**be**] *burst-excess* [**conform-action** *action*] [**exceed-action** *action*] [**violate-action** *action*]
6. **exit**
7. **policy-map** *policy-map-name*
8. **class** *class-map-name*
9. **priority**
10. **service-policy** *policy-map-name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.

How to Configure a Child Policy Under a Parent Priority Class

	Command or Action	Purpose
Step 3	<p>policy-map <i>policy-map-name</i></p> <p>Example: Router(config)# policy-map Business</p>	<p>Creates or modifies the child policy. Enters policy-map configuration mode.</p> <ul style="list-style-type: none"> <i>policy-map-name</i> is the name of the child policy map. The name can be a maximum of 40 alphanumeric characters.
Step 4	<p>class <i>class-map-name</i></p> <p>Example: Router(config-pmap)# class video</p>	<p>Assigns the traffic class you specify to the policy map. Enters policy-map class configuration mode.</p> <ul style="list-style-type: none"> <i>class-map-name</i> is the name of a previously configured class map.
Step 5	<p>police [cir] <i>bps</i> [Bc] <i>burst-normal</i> [Be] <i>burst-excess</i> [conform-action <i>action</i>] [exceed-action <i>action</i>] [violate-action <i>action</i>]</p> <p>Example: Router(config-pmap-c)# police 4000000 2000 5000 conform-action transmit exceed-action set-dscp-transmit 5</p>	<p>Configures traffic policing.</p> <ul style="list-style-type: none"> cir is the committed information rate. <i>bps</i> specifies the average rate in bits per second (bps). Bc is the normal or committed burst (bc) size used by the first token bucket for policing. <i>burst-normal</i> specifies the committed burst size in bytes. Be is the excess burst (be) size used by the second token bucket for policing. <i>burst-excess</i> specifies the excess burst in bytes. conform-action <i>action</i> specifies the action to take on packets that conform to the rate limit. exceed-action <i>action</i> specifies the action to take on packets that exceed the rate limit, but not the peak information rate (PIR). violate-action <i>action</i> specifies the action to take on packets that continuously exceed the PIR limit.
Step 6	<p>exit</p> <p>Example: Router(config-pmap-c)# exit</p>	<p>Exits policy-map class configuration mode.</p>
Step 7	<p>policy-map <i>policy-map-name</i></p> <p>Example: Router(config-pmap)# policy-map Premium</p>	<p>Creates or modifies the top-level parent policy (nested policy), or the middle-level policy (three-level hierarchical policy).</p> <ul style="list-style-type: none"> <i>policy-map-name</i> is the name of the parent or middle-level policy map. The name can be a maximum of 40 alphanumeric characters.
Step 8	<p>class <i>class-map-name</i></p> <p>Example: Router(config-pmap)# class Gold</p>	<p>Assigns the traffic class you specify to the policy map. Enters policy-map class configuration mode.</p> <ul style="list-style-type: none"> <i>class-map-name</i> is the name of a previously configured class map.

	Command or Action	Purpose
Step 9	priority	Assigns priority to the traffic class.
	Example: Router(config-pmap-c)# priority	
Step 10	service-policy <i>policy-map-name</i>	Applies a child policy to the parent or middle-level priority class.
	Example: Router(config-pmap-c)# service-policy Business	<ul style="list-style-type: none"> <i>policy-map-name</i> is the name of a previously configured child policy map. <p>Note For three-level hierarchical policies, after applying the child policy to the middle-level priority class, you must then apply the middle-level policy to the parent policy. For more information, see “Defining QoS for Multiple Policy Levels” in the <i>Cisco 10000 Series Router Quality of Service Configuration Guide</i>.</p>

Attaching a Hierarchical Service Policy to a Subinterface

Use the following procedure to attach a hierarchical service policy to a subinterface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type slot/module/port.subinterface* [point-to-point]
4. **service-policy** {input | output} *policy-map-name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.
	Example: Router> enable	<ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal	Enters global configuration mode.
	Example: Router# configure terminal	

	Command or Action	Purpose
Step 3	<p>interface <i>type slot/module/port.subinterface</i> [<i>point-to-point</i>]</p> <p>Example: Router(config)# interface atm 1/0/2.1</p>	<p>Configures or modifies a subinterface. Enters subinterface configuration mode.</p> <ul style="list-style-type: none"> • <i>type</i> is the interface type (for example, ATM). • <i>slot/module/port</i> is the slot, module, and port number of the interface card (for example, 1/0/0). • <i>.subinterface</i> is the number of the subinterface (for example, .1)
Step 4	<p>service-policy {<i>input</i> <i>output</i>} <i>policy-map-name</i></p> <p>Example: Router(config-subif)# service-policy input Premium</p>	<p>Applies an hierarchical policy to the subinterface.</p> <ul style="list-style-type: none"> • <i>policy-map-name</i> is the name of parent policy map. • input indicates to apply the service policy to inbound packets. • output indicates to apply the service policy to outbound packets.

Configuration Examples for Configuring a Child Policy Under a Priority Class

This section provides the following configuration examples:

- [Configuring a Police-Based Child Policy Under a Priority Class: Example, page 6](#)
- [Attaching a Bandwidth-Based Child Policy to a Priority Class—Invalid Configuration: Example, page 7](#)
- [Attaching Bandwidth to a Child Policy Attached to a Priority Class—Invalid Configuration: Example, page 7](#)
- [Attaching Priority to a Parent Policy with a Queuing-Based Child Policy—Invalid Configuration: Example, page 8](#)

Configuring a Police-Based Child Policy Under a Priority Class: Example

The following example configuration shows how to configure a child policy with policing enabled and attach it to a priority class of a parent policy.

```
policy-map Child
  class class1
    police 10000
!
policy-map Parent
  class P2
    priority
    service-policy Child
```

Attaching a Bandwidth-Based Child Policy to a Priority Class—Invalid Configuration: Example

As shown in the following example configuration, the router does not allow you to attach a bandwidth-based child policy to a priority class of a parent policy. This is an invalid configuration.

```

policy-map Child
  class class1
    bandwidth 100
!
policy-map Parent
  class P2
    priority
    service-policy Child
Please remove priority before attaching a child policy.
!
!
show policy-map
policy-map Child
  class class1
    bandwidth 100
!
policy-map Parent
  class P2
    priority

```

Attaching Bandwidth to a Child Policy Attached to a Priority Class—Invalid Configuration: Example

As shown in the following example configuration, the router does not allow you to add the **bandwidth** command to a child policy that is already attached to a priority class of a parent policy. This is an invalid configuration.

```

policy-map Child
  class class1
    police cir 10000 bc 1500 conform-action transmit exceed-action drop
!
policy-map Parent
  class P2
    priority
    service-policy Child
!
!
policy-map Child
  class class1
    bandwidth 10
Cannot configure 'bandwidth' in child policy with 'priority' in parent
!
!
show policy-map

policy-map Child
  class class1
    police cir 10000 bc 1500 conform-action transmit exceed-action drop
!
policy-map Parent
  class P2
    priority
    service-policy Child

```

Attaching Priority to a Parent Policy with a Queuing-Based Child Policy—Invalid Configuration: Example

As shown in the following example configuration, the router does not allow you to assign priority to a class of a parent policy when a queuing-based child policy is already attached to the parent class. This is an invalid configuration.

```

policy-map Child
  class class1
    bandwidth 10
  !
policy-map Parent
  class P2
    police cir 10000 bc 1500 conform-action transmit exceed-action drop
    service-policy Child
  !
!
policy-map Parent
  class P2
    priority
Cannot configure 'priority' in parent policy with queuing-related child policy.
!
!
show policy-map
policy-map Child
  class class1
    bandwidth 10
  !
policy-map Parent
  class P2
    police cir 10000 bc 1500 conform-action transmit exceed-action drop
    service-policy Child

```

Additional References

The following sections provide references related to the QoS Child Service Policy for Priority Class feature.

Related Documents

Related Topic	Document Title
Hierarchical policies	Cisco 10000 Series Router Quality of Service Configuration Guide, “Defining QoS for Multiple Policy Levels”
Policing and shaping	Cisco IOS Quality of Service Solutions Configuration Guide, Policing and Shaping Overview Cisco 10000 Series Router Quality of Service Configuration Guide Policing Traffic Cisco 10000 Series Router Quality of Service Configuration Guide Shaping Traffic
Policy maps	Cisco 10000 Series Router Quality of Service Configuration Guide, Configuring QoS Policy Actions and Rules

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Technical Support & Documentation website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

This feature uses no new or modified commands.

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