



## Default DOCSIS 1.0 ToS Overwrite

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This document describes the Default DOCSIS 1.0 ToS Overwrite feature for the Cisco Cable Modem Termination System (CMTS). This feature eliminates the need to create multiple QoS profiles in order to perform type of service (ToS) overwrite by enabling a default ToS overwrite to be bound to all DOCSIS 1.0 Cable Modem (CM) created profiles.

Your software release may not support all the features that are documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. The Feature Information Table at the end of this document provides information about the documented features and lists the releases in which each feature is supported.

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

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## Hardware Compatibility Matrix for the Cisco cBR Series Routers



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**Note** The hardware components that are introduced in a given Cisco IOS-XE Release are supported in all subsequent releases unless otherwise specified.

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Table 1: Hardware Compatibility Matrix for the Cisco cBR Series Routers

Cisco CMTS Platform	Processor Engine	Interface Cards
Cisco cBR-8 Converged Broadband Router	<p><b>Cisco IOS-XE Release 16.5.1 and Later Releases</b></p> <p>Cisco cBR-8 Supervisor:</p> <ul style="list-style-type: none"> <li>• PID—CBR-SUP-250G</li> <li>• PID—CBR-CCAP-SUP-160G</li> </ul>	<p><b>Cisco IOS-XE Release 16.5.1 and Later Releases</b></p> <p>Cisco cBR-8 CCAP Line Cards:</p> <ul style="list-style-type: none"> <li>• PID—CBR-LC-8D30-16U30</li> <li>• PID—CBR-LC-8D31-16U30</li> <li>• PID—CBR-RF-PIC</li> <li>• PID—CBR-RF-PROT-PIC</li> <li>• PID—CBR-CCAP-LC-40G</li> <li>• PID—CBR-CCAP-LC-40G-R</li> <li>• PID—CBR-CCAP-LC-G2-R</li> <li>• PID—CBR-SUP-8X10G-PIC</li> <li>• PID—CBR-2X100G-PIC</li> </ul> <p>Digital PICs:</p> <ul style="list-style-type: none"> <li>• PID—CBR-DPIC-8X10G</li> <li>• PID—CBR-DPIC-2X100G</li> </ul> <p>Cisco cBR-8 Downstream PHY Module:</p> <ul style="list-style-type: none"> <li>• PID—CBR-D31-DS-MOD</li> </ul> <p>Cisco cBR-8 Upstream PHY Modules:</p> <ul style="list-style-type: none"> <li>• PID—CBR-D31-US-MOD</li> </ul>



**Note** Do not use DPICs (8X10G and 2x100G) to forward IP traffic, as it may cause buffer exhaustion, leading to line card reload.

The only allowed traffic on a DPIC interface is DEPI, UEPI, and GCP traffic from the Cisco cBR-8 router to Remote PHY devices. Other traffic such as DHCP, SSH, and UTSC should flow via another router, since DPICs cannot be used for normal routing.

## Restrictions for Default DOCSIS 1.0 ToS Overwrite

- The Default DOCSIS 1.0 ToS Overwrite feature is only applicable to CMs running DOCSIS version 1.0.

- Once the Default DOCSIS 1.0 ToS Overwrite feature is configured, all CMs will need to be reset in order for the effect to take place.
- Once the Default DOCSIS 1.0 ToS Overwrite feature is configured, all CMs will display the default values that were configured. After which, overwrite values can only be changed by editing the QoS profiles.

## Information About Default DOCSIS 1.0 ToS Overwrite

To configure the Default DOCSIS 1.0 ToS Overwrite feature, you should understand the following topic:

### Default DOCSIS 1.0 ToS Overwrite Overview

Currently, ToS overwrite requires the creation of static cable QoS profiles, which are assigned ToS fields and are then associated with 1.0 CMs. This implementation works well if only a few different service types are offered.

However, scalability issues arises when large numbers of service types are presented; each requiring a static QoS profile in order to perform ToS overwrite.

The Default DOCSIS 1.0 ToS Overwrite feature eliminates the need to create multiple QoS profiles in order to perform type-of-service (ToS) overwrite by automatically bounding all DOCSIS 1.0 Cable Modem (CM) created profiles to a default ToS overwrite.

## DOCSIS

Created by CableLabs, Data Over Cable Service Interface Specification (DOCSIS) defines the interface standards and requirements for all cable modems associated with high-speed data distribution over a cable television system network.

The DOCSIS architecture consists of the following two components:

- Cable Modem (CM)
- Cable Modem Termination System (CMTS)

Each of these components are situated at different locations, often with the CM located on a customer site and the CMTS on the service provider site, and communication between the CM and CMTS is conducted over cable through DOCSIS.



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**Note** Though there are several versions of DOCSIS available, the Default DOCSIS 1.0 ToS Overwrite feature is only applicable to CMs running DOCSIS 1.0.

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### Type-of-Service (ToS)

Tools such as type-of-service (ToS) bits identification make it possible to isolate network traffic by the type of application being used. ToS capabilities can be further expanded to isolate network traffic down to the specific brands, by the interface used, by the user type and individual user identification, or by the site address.

# How to Configure Default DOCSIS 1.0 ToS Overwrite

The tasks in this section enables the use of the Default DOCSIS 1.0 ToS Overwrite feature.

## Enabling Default DOCSIS 1.0 ToS Overwrite

All CMs with a DOCSIS 1.0 configuration file currently have their ToS overwrite default values are set to `tos-and: 0xff` and `tos-or: 0x00`. Since there were previously no mechanism in the DOCSIS 1.0 configuration file to specify the ToS overwrite, QoS profiles were created and assigned to the default ToS overwrites.

The following procedures enable the Default DOCSIS 1.0 ToS Overwrite feature, which will allow a default ToS overwrite to be bound to all CM created profiles.

### Before you begin

There are no prerequisites for these procedures.



#### Note

- The Default DOCSIS 1.0 ToS Overwrite feature is only applicable to CMs running DOCSIS version 1.0.
- Once the Default DOCSIS 1.0 ToS Overwrite feature is configured, all CMs will need to be reset in order for the effect to take place.
- Once the Default DOCSIS 1.0 ToS Overwrite feature is configured, all CMs will display the default values that were configured. After which, overwrite values can only be changed by editing the QoS profiles.

### Procedure

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configureterminal</b> <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>cable default-tos-qos10 tos-overwrite <i>tos-and tos-or</i></b> <b>Example:</b> Router(config)# cable default-tos-qos10 tos-overwrite 0x1F 0xE0	Configures the ToS overwrite default value for the CM. This default value will be bound to all future CM created profiles.
Step 4	<b>end</b> <b>Example:</b>	Exits interface configuration mode and returns to privileged EXEC mode.

	Command or Action	Purpose
	Router(config-if)# <b>end</b>	

### What to do next

After configuring the ToS overwrite default value, reset the CM using the **clear cable modem delete** command to allow the new ToS overwrite default value to take effect.

## Editing QoS Profiles

Once the Default DOCSIS 1.0 ToS Overwrite feature is configured, additional ToS overwrite values can be changed by editing the QoS profiles.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configureterminal</b> <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>cable qos profile</b> { <i>groupnum</i>   <i>ip-precedence</i>   <i>guaranteed-upstream</i>   <i>max-burst</i>   <i>max-upstream</i>   <i>max-downstream</i>   <i>priority</i>   <i>tos-overwrite</i>   <i>value</i> } <b>Example:</b> Router(config)# <b>cable qos profile 4</b> <b>guaranteed-upstream 2</b>	Configures the QoS profile.
<b>Step 4</b>	<b>end</b> <b>Example:</b> Router(config-if)# <b>end</b>	Exits interface configuration mode and returns to privileged EXEC mode.

## Additional References

The following sections provide references related to the Default DOCSIS 1.0 ToS Overwrite 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, tools, and technical documentation. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for Default DOCSIS 1.0 ToS Overwrite

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the <https://cfng.cisco.com/> link. An account on the Cisco.com page is not required.



**Note** The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

*Table 2: Feature Information for Default DOCSIS 1.0 ToS Overwrite*

Feature Name	Releases	Feature Information
Default DOCSIS 1.0 ToS overwrite	Cisco IOS XE Everest 16.6.1	This feature was integrated into Cisco IOS XE Everest 16.6.1 on the Cisco cBR Series Converged Broadband Routers.