CBQoS MIB Index Enhancements

The Class-Based Quality of Service (CBQoS) MIB Index Enhancements feature introduces persistence across all CBQoS MIB indexes including cbQosConfigIndex, cbQosObjectsIndex, and cbQosPolicyIndex.

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.

Prerequisites for the QoS CBQoS MIB Index Enhancements

You must enable ifMIB persistence by issuing the **snmp-server ifindex persist**command. Then issue the **snmp mib persist cbqos**command to enable CBQoS MIB index persistence.

Note If you issue the **snmp mib persist cbqos**commandbeforethe **snmp-server ifindex persist**command, you receive a prompt requesting you to enable ifIndex persistence first.

Restrictions for the CBQoS MIB Index Enhancements

If the internal hashing of configuration strings causes too many collisions, NVRAM storage may become tight. You can issue the **more nvram** command to display a new collision file called cbqos-mib to help you keep track of the size.

Information About the CBQoS MIB Index Enhancements

Feature Overview of the QoS CBQoS MIB Index Enhancements

The cbQosConfigIndex, cbQosObjectsIndex, and cbQosPolicyIndex are volatile because when a networking device reboots, the index numbers may change. This happens because system rebooting can cause the order of the Modular QoS CLI (MQC) configuration to differ from the actual configuration order, which is user-driven and unpredictable. As a result, you must read the MIB frequently to extract statistical and configuration information. Therefore, once a reload has occurred, the MIB has to be repolled to reestablish the indexes to the data stored in the CBQoS MIB.

Traditionally, MIB persistence is handled by Cisco IOS APIs, which save the index and key information to NVRAM. The data is then retrieved and repopulated after reloading. However, this approach does not work well for the current implementation of the cbQosObjectsIndex because of the large amount of information that needs to be saved.

An index encoding scheme based on configuration entries instead of operational sequence is being implemented to provide persistent indexes on router reload so that MIB information retains the same set of object values each time that a networking device reboots.

The index encoding scheme has been changed to handle the performance/scalability issue. Each service policy is uniquely identified by an index called cbQosPolicyIndex, and its cbQosObjectsIndex is uniquely identified under the service policy.

Note As a result of this change in the index encoding scheme, an application must not assume that the cbQosPolicyIndex is usually identical to its cbQosObjectsIndex as a policy-map.

Benefits of the QoS CBQoS MIB Index Enhancements

These enhancements provide a repeatable method for generating MIB indexes so that they do not change between reboots.

The complexity of configuring and correlating statistics objects is reduced, making it easier for network management applications to gather accurate information.

How to Configure the CBQoS MIB Index Enhancements

Enabling Cisco IOS MIB and CBQoS MIB Index Persistence

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server ifindex persist**
4. **snmp mib persist** [**cbqos** | **v3mibs**]
5. **end**
6. **write mib-data**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server ifindex persist** **Example:** `Router(config)# snmp-server ifindex persist`	Enables Cisco IOS MIB index (ifIndex) persistence.
Step 4	**snmp mib persist** [**cbqos**	**v3mibs**] **Example:** `Router(config)# snmp mib persist cbqos`	Enables MIB persistence. • The optional **cbqos** keyword enables CBQoS MIB persistence. • The optional **v3mibs** keyword enables v3 MIB persistence. **Note** If you have not enabled Cisco IOS MIB index (ifIndex) persistence (Step Enabling Cisco IOS MIB and CBQoS MIB Index Persistence), the following message appears when you issue the **snmp mib persist cbqos** command: Enable 'snmp-server ifindex persist' for persist cbqos index

	Command or Action	Purpose
Step 5	**end** **Example:** Router(config)# end	Returns to privileged EXEC mode.
Step 6	**write mib-data** **Example:** **write** **Example:** Router# write mib-data **Example:** Router# write	Saves CBQoS MIB data to NVRAM.

Verifying CBQoS MIB Index Persistence

SUMMARY STEPS

1. **enable**
2. **show running-config   include cbqos**
3. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	**Purpose**
Step 2	**show running-config include cbqos** **Example:** Router# show running-config | include cbqos	Displays the configuration information currently running on the router. **Note** The information should include snmp mib persist cbqos.
Step 3	**exit** **Example:** Router# exit	Returns to user EXEC mode.

Configuration Examples for the CBQoS MIB Index Enhancements

Example Enabling Cisco IOS MIB and CBQoS MIB Index Persistence

The following example enables Cisco IOS MIB (ifIndex) and CBQoS MIB index persistence:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# snmp-server ifindex persist
Router(config)# snmp mib persist cbqos
```

Examples Verifying Cisco IOS MIB and CBQoS MIB Index Persistence

The following examples verify that Cisco IOS MIB (ifIndex) and CBQoS MIB index persistence have been configured:

```
Router# show running-config
| include cbqos
snmp mib persist cbqos
Router# show running-config
| include persist
snmp-server ifindex persist
snmp mib persist cbqos
```

Additional References

Related Documents

Related Topic	Document Title
QoS commands	*Cisco IOS Quality of Service Solutions Command Reference*
SNMP commands	*Cisco IOS Network Management Command Reference*
SNMP configuration tasks, MIB persistence	"Configuring SNMP Support" module
Other documentation	For information on using SNMP MIB features, see the appropriate documentation for your network management system.

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
CISCO-CLASS-BASED-QOS-MIB, Revision 13 **Note** The CISCO-CLASS-BASED-QOS-MIB is actually two MIBs: the CISCO-CLASS-BASED-QOS-MIB and the CISCO-CLASS-BASED-QOS-CAPABILITY-MIB.	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 2233	*The Interfaces Group MIB Using SMIv2*

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 the QoS CBQoS MIB Index Enhancements

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 the QoS CBQoS MIB Index Enhancements

Feature Name	Releases	Feature Information
QoS CBQoS MIB Index Enhancements	Cisco IOS XE Release 2.4	The CBQoS MIB Index Enhancements feature introduces persistence across all CBQoS MIB indexes including cbQosConfigIndex, cbQosObjectsIndex, and cbQosPolicyIndex.