

Using AutoQoS

This chapter describes how to use the automatic quality of service (QoS) configuration feature in Cisco IOS Software Release 12.2SX. Release 12.2(33)SXH and later releases support the automatic quality of service (QoS) configuration feature.



Note

For complete syntax and usage information for the commands used in this chapter, see the Cisco IOS Software Releases 12.2SX Command References at this URL:

http://www.cisco.com/en/US/docs/ios/mcl/122sx_mcl.html

This chapter consists of these sections:

- [Understanding AutoQoS, page 37-1](#)
- [Using AutoQoS, page 37-3](#)

Understanding AutoQoS

AutoQoS is a macro that applies the recommended Architecture for Voice, Video, and Integrated Data (AVVID) QoS settings to a port. These sections describe how autoQoS works:

- [AutoQoS Support for a Cisco IP Phone, page 37-1](#)
- [AutoQoS Support for Cisco IP Communicator, page 37-2](#)
- [AutoQoS Support for Marked Traffic, page 37-2](#)

AutoQoS Support for a Cisco IP Phone

Cisco IP phones are usually connected directly to ports. Optionally, you can attach a PC to the phone and use the phone as a hop to the switch.

The traffic that comes from the phone can be marked with an 802.1Q or 802.1p tag. The tag contains a VLAN ID and CoS value. When you configure the port to trust the CoS value that comes from the phone, the switch uses the CoS value to prioritize the phone traffic.

There is a three-port switch built into Cisco IP phones that forwards the traffic that comes from the PC, the phone, and the switch port. Cisco IP phones have trust and classification capabilities that you need to configure (see the [“Configuring Cisco IP Phone Support” section on page 12-7](#)).

AutoQoS supports Cisco IP phones with the **auto qos voip cisco-phone** interface configuration command. When you enter the **auto qos voip cisco-phone** interface configuration command on a port that is configured to support an IP phone and to which an IP phone is connected, the autoQoS feature does the following:

- If QoS was not already enabled, enables QoS globally.
- If VLAN-based QoS was configured for the port, reverts to the default port-based QoS (done for all ports on switching modules with **1p1q0t/1p3q1t** ports).
- Sets the port trust state to trust CoS.
- Creates and applies a trust-CoS QoS policy to ports on switching modules with non-Gigabit Ethernet **1q4t/2q2t** ports, which do not support port trust.

AutoQoS Support for Cisco IP Communicator

The Cisco IP Communicator program runs on a PC and emulates a Cisco IP phone. The Cisco IP Communicator marks its voice traffic with a DSCP value instead of a CoS value. When you configure the port to trust the DSCP value that comes from the Cisco IP Communicator, the switch uses the DSCP value to prioritize the Cisco IP Communicator traffic.

AutoQoS supports the Cisco IP Communicator program with the **auto qos voip cisco-softphone** interface configuration command. When you enter the **auto qos voip cisco-softphone** interface configuration command on a port that is connected to a device running the Cisco IP Communicator program, the autoQoS feature does the following:

- If QoS was not already enabled, enables QoS globally.
- If VLAN-based QoS was configured for the port, reverts to the default port-based QoS (done for all ports on switching modules with **1p1q0t/1p3q1t** ports).
- If a trust state was configured for the port, reverts to the default untrusted state.
- Creates and applies ingress policers to trust DSCP 46 and remark DSCP 26 packets to DSCP 24. Packets with other DSCP values or out-of-profile packets are remarked with DSCP 0.

AutoQoS Support for Marked Traffic

Ports that connect to the interior of your network might receive traffic that has already been marked with QoS labels that are consistent with your network QoS policies, and which do not need to be changed. You can use the QoS trust feature to process the marked traffic using the received QoS values.

AutoQoS supports marked traffic with the **auto qos voip trust** interface configuration command. When you enter the **auto qos voip trust** interface configuration command, the autoQoS feature does the following:

- If QoS was not already enabled, enables QoS globally.
- If VLAN-based QoS was configured for the port, reverts to the default port-based QoS (done for all ports on switching modules with **1p1q0t/1p3q1t** ports).
- If the port is configured with the **switchport** command, sets the port trust state to trust CoS.

- If the port is not configured with the **switchport** command, sets the port trust state to trust DSCP.
- Creates and applies a trust-CoS or trust-DSCP QoS policy to ports on switching modules with non-Gigabit Ethernet **1q4t/2q2t** ports, which do not support port trust.

Using AutoQoS

These sections describe how to use autoQoS:

- [AutoQoS Configuration Guidelines and Restrictions, page 37-3](#)
- [Configuring AutoQoS, page 37-4](#)

AutoQoS Configuration Guidelines and Restrictions

These sections provide the configuration guidelines and restrictions for autoQoS:

- AutoQoS generates commands for the port and adds the generated commands to the running configuration.
- The generated QoS commands are applied as if you were entering them from the CLI. An existing configuration might cause the application of the generated commands to fail or an existing configuration might be overridden by the generated commands. These actions occur without warning. If the generated commands are successfully applied, any configuration that was not overridden remains in the running configuration. Any commands that were overridden might still exist in the startup-config file.
- Some of the generated commands are the type of PFC QoS commands that are applied to [all ports controlled by a port ASIC](#). When one of these commands is applied, PFC QoS displays the messages caused by application of the command to all the ports controlled by the port ASIC. Depending on the module, these commands are applied to as many as 48 ports. See the “Number of port groups” and “Port ranges per port group” listed for each module in the *Release Notes for Cisco IOS Release 12.2(33)SXH and Later Releases*.
- You might not be able to configure support for Cisco IP phones and the other autoQoS options on ports that are controlled by the same port ASIC because of conflicting port trust state requirements.
- If application of the generated commands fails, the previous running configuration is restored.
- Enable autoQoS before you configure other QoS commands. If necessary, you can modify the QoS configuration after the autoQoS configuration completes.
- AutoQoS cannot attach a policy map to an interface if there is already a policy map attached.
- Do not modify a policy map or class map that includes AUTOQOS in its name.
- You cannot configure autoQoS on the following:
 - Port-channel interfaces
 - VLAN interfaces (also known as switch virtual interfaces or SVIs)
 - Tunnel interfaces
 - Loopback interfaces
 - Subinterfaces on any type of interface

Configuring AutoQoS

These sections describe how to configure autoQoS:

- [Configuring AutoQoS Support for a Cisco IP Phone, page 37-4](#)
- [Configuring AutoQoS Support for Cisco IP Communicator, page 37-5](#)
- [Configuring AutoQoS Support for Marked Traffic, page 37-6](#)



Note

AutoQoS generates commands that are appropriate for the QoS port architecture of the port on which you enter an **auto qos voip** command. For each of the different **auto qos voip** commands, autoQoS generates different QoS commands for each of these QoS port architectures:

- 1p1q0t/1p3q1t
- 1p1q4t/1p2q2t
- 1p1q4t/1p3q8t
- 1p1q8t/1p2q1t
- 1q2t/1p2q2t
- 1q2t/1p3q8t
- 1q4t/2q2t
- 1q8t/1p3q8t
- 1q8t/1p7q8t
- 2q8t/1p3q8t
- 8q4t/1p7q4t
- 8q8t/1p7q8t

The procedures in the following sections include the commands that you need to enter to display the generated commands, but the specific commands that autoQoS generates are not listed in this document.

Configuring AutoQoS Support for a Cisco IP Phone



Note

Complete the configuration procedures in the “[Configuring Cisco IP Phone Support](#)” section on [page 12-7](#) before you configure autoQoS for a Cisco IP phone.

To configure autoQoS for a Cisco IP phone, perform this task:

| | Command | Purpose |
|--------|---|---|
| Step 1 | Router# configure terminal | Enters global configuration mode. |
| Step 2 | Router(config)# interface <i>type</i> ¹ <i>slot/port</i> | Selects the interface to configure. |
| Step 3 | Router(config-if)# auto qos voip cisco-phone | Configures autoQoS for a Cisco IP phone. |
| Step 4 | Router(config-if)# end | Returns to privileged EXEC mode. |
| Step 5 | Router# show auto qos interface <i>type</i> ¹ <i>slot/port</i> | Displays the configured autoQoS commands. |

| | Command | Purpose |
|--------|---|--|
| Step 6 | Router# show running-config include mls qos map cos-dscp | Displays the generated received CoS to internal DSCP map . |
| Step 7 | Router# show running-config interface type¹ slot/port | Displays all of the commands configured on the interface. |

1. *type* = fastethernet or gigabitethernet

When configuring autoQoS for a Cisco IP phone, note the following information:

- To disable autoQoS on an interface, use the **no auto qos voip** interface configuration command.



Note The **no auto qos voip** interface configuration command does not disable QoS globally or delete the received CoS to internal DSCP map created by autoQoS.

- You might see messages that instruct you to configure other ports to trust CoS. You must do so to enable the autoQoS generated commands.

This example shows how to enable autoQoS on Fast Ethernet interface 1/1:

```
Router(config)# interface fastethernet 1/1
Router(config-if)# auto qos voip cisco-phone
```

Configuring AutoQoS Support for Cisco IP Communicator

To configure autoQoS for Cisco IP Communicator, perform this task:

| | Command | Purpose |
|--------|--|---|
| Step 1 | Router# configure terminal | Enters global configuration mode. |
| Step 2 | Router(config)# interface type¹ slot/port | Selects the interface to configure. |
| Step 3 | Router(config-if)# auto qos voip cisco-softphone | Configures autoQoS for Cisco IP Communicator. |
| Step 4 | Router(config-if)# end | Returns to privileged EXEC mode. |
| Step 5 | Router# show auto qos interface type¹ slot/port | Displays the configured autoQoS commands. |
| Step 6 | Router# show policy-map AUTOQOS-CISCO-SOFT-PHONE | Displays the policy map and policers created by autoQoS. |
| Step 7 | Router# show class-map AUTOQOS-CISCO-SOFTPHONE-SIGNAL Router# show class-map AUTOQOS-CISCO-SOFTPHONE-DATA | Displays the class maps created by autoQoS. |
| Step 8 | Router# show running-config include mls qos map policed-dscp | Displays the DSCP markdown maps created by autoQoS. |
| Step 9 | Router# show running-config interface type¹ slot/port | Displays all of the commands configured on the interface. |

1. *type* = fastethernet, gigabitethernet, or tengigabitethernet

When configuring autoQoS for Cisco IP Communicator, note the following information:

- To disable autoQoS on an interface, use the **no auto qos voip** interface configuration command.



Note The **no auto qos voip** interface configuration command does not disable QoS globally or delete the policy, class, and DSCP markdown maps created by autoQoS.

- You cannot configure support for Cisco IP Communicator on ports that are configured with the **switchport** keyword.
- PFC QoS supports 1023 aggregate policers and each use of the **auto qos voip cisco-softphone** command on a port uses two aggregate policers.

This example shows how to enable autoQoS on Fast Ethernet interface 1/1:

```
Router(config)# interface fastethernet 1/1
Router(config-if)# auto qos voip cisco-softphone
```

Configuring AutoQoS Support for Marked Traffic

To configure autoQoS for marked traffic, perform this task:

| | Command | Purpose |
|--------|--|---|
| Step 1 | Router# configure terminal | Enters global configuration mode. |
| Step 2 | Router(config)# interface <i>type</i> ¹ <i>slot/port</i> | Selects the interface to configure. |
| Step 3 | Router(config-if)# auto qos voip trust | Configures autoQoS for marked traffic. |
| Step 4 | Router(config-if)# end | Returns to privileged EXEC mode. |
| Step 5 | Router# show auto qos interface <i>type</i> ¹ <i>slot/port</i> | Displays the configured autoQoS commands. |
| Step 6 | Router# show running-config include mls qos map cos-dscp | For ports configured with the switchport command, displays the generated received CoS to internal DSCP map . |
| Step 7 | Router# show running-config interface <i>type</i> ¹ <i>slot/port</i> | Displays all of the commands configured on the interface. |

1. *type* = fastethernet, gigabitethernet, or tengigabitethernet

When configuring autoQoS to trust marked traffic, note the following information:

- To disable autoQoS on an interface, use the **no auto qos voip** interface configuration command.



Note The **no auto qos voip** interface configuration command does not disable QoS globally or delete the [received CoS to internal DSCP map](#) created by autoQoS.

- For ports configured with the **switchport** command, you might see messages that instruct you to configure other ports to trust CoS. You must do so to enable the autoQoS generated commands.

This example shows how to enable autoQoS on Fast Ethernet interface 1/1:

```
Router(config)# interface fastethernet 1/1
Router(config-if)# auto qos voip trust
```