Q&A

CISCO AutoQoS

Q. What is Cisco AutoQoS?

A. Cisco AutoQoS is innovative technology that minimizes the complexity, time, and operating cost of Quality of Service (QoS) deployment. Cisco AutoQoS incorporates value-added intelligence into Cisco IOS® Software and Cisco Catalyst® Operating Service Software to provision and manage large-scale QoS deployments.

The first phase of Cisco AutoQoS targets Voice over IP (VoIP) deployments for customers who want to deploy IP telephony, but who lack the expertise and/or staffing to plan and deploy IP QoS and IP services.

Q. What is the relationship between Cisco AutoQoS and Cisco QoS?

A. Cisco AutoQoS automates consistent deployment of QoS features across Cisco routers and switches. It enables various Cisco QoS components based on the network environment and Cisco best-practice recommendations. With the increased prominence of delay-sensitive applications (voice, video, and other multimedia applications) deployed in networks today, proper QoS configuration will ensure high-quality application performance.

Currently, this presupposes a deep understanding of various QoS features (ie: queuing, dropping, traffic conditioning, queue-depth, drop thresholds, burst parameters, LFI, and cRTP) and the complexities of configuring many parameters associated with these features. Cisco AutoQoS helps overcome these difficulties by automatically configuring the device for Cisco QoS features and variables with the correct parameters.

Users can subsequently tune parameters that are generated by Cisco AutoQoS to suit their particular application needs, as desired.

Q. What customer problems does Cisco AutoQoS solve?

A. Typically, QoS network design and implementation over multiple LAN and WAN sites is fairly complex and labor intensive. Customers wish to reduce deployment time, provisioning errors, and operating expenses to optimize their network for the applications, while retaining the flexibility to subsequently fine-tune QoS.

To expedite QoS deployment, the user interface must be simplified. Cisco AutoQoS addresses this by automating the five main aspects of QoS deployment (Application Classification, Policy Generation, Configuration, and Monitoring & Reporting and Consistency) while adding control plane intelligence to create a simple, accelerated and tunable solution.

CISCOWORKS QOS POLICY MANAGER

Q. What is CiscoWorks QoS Policy Manager?

A. CiscoWorks QoS Policy Manager (QPM) is a key enabler of end-to-end QoS for IP networks. QPM 3.0 is a QoS management tool that combines centralized traffic monitoring with network-wide configuration of differentiated services for voice, video, and data applications by leveraging the intelligent Cisco infrastructure. For more information, please see:

http://www.cisco.com/en/US/products/sw/cscowork/ps2064/tsd_products_support_series_home.html

What are the benefits of CiscoWorks QPM?

A. CiscoWorks QPM can improve converged network operations by providing a centralized, intelligent, and cost-effective way to manage traffic according to Enterprise requirements. Network administrators will fully leverage embedded Cisco IOS Software and Cisco Catalyst OS QoS mechanisms, gain visibility into traffic throughput at different points in the network, and enable network-wide performance protection for voice, video, and critical data. The productivity of operators is increased with QoS management, which spans from baseline profiling traffic by top applications and distribution of traffic by service classes to network-wide QoS provisioning and monitoring for QoS policy validation. CiscoWorks QPM includes user roles and permissions to control privileges for policy view, modification and deployment. It supports hundreds of different Cisco devices.

For more information, please see: http://cisco.com/en/US/products/sw/cscowork/ps2064/products_device_support_tables_list.html

Q. Does CiscoWorks QPM support the component Cisco IOS QoS functions that Cisco AutoQoS uses to configure QoS for voice?

A. Yes. The user can use CiscoWorks QPM to conveniently modify the Cisco AutoQoS generated policies to fit specific network requirements. After deployment, associated monitoring tasks can be initiated to generate real-time and historical QoS feedback.

CISCO AUTOQOS BENEFITS

Q. What are the key benefits of Cisco AutoQoS?

- Cisco AutoQoS simplifies QoS deployment and speeds up the provisioning of Quality of Service technology over a Cisco network infrastructure. It reduces human error and lowers training costs. With AutoQoS-VoIP, one command can enable QoS for VoIP across every Cisco router and switch. The user can also modify the AutoQoS-generated policy/commands via CLI to meet specific requirements.
- Enterprises can benefit from deployment costs and time that are up to three times cheaper and faster than a manual approach; Service Providers can use the template driven approach of AutoQoS to reduce the operational expense incurred in provisioning managed services and QoS for voice traffic to large numbers of customer premise devices.
- CiscoWorks QPM can be used to provide a centralized, web-based tool to cost-effectively manage and monitor network-wide QoS policies, including AutoQoS. Cisco AutoQoS together with CiscoWorks QPM, eases QoS deployment, provisioning, and management.

CISCO AUTOQOS TECHNICAL INFORMATION

Q. What is Cisco AutoQoS-VoIP?

A. With AutoQoS-VoIP, users obtain a simple and intelligent CLI for enabling campus LAN and WAN QoS for VoIP on Cisco switches and routers. It does not require knowledge of underlying network technology (PPP, Frame Relay, ATM, ATM to FR internetworking), service policies required, and link efficiency mechanisms needed to ensure voice quality and reduce latency, jitter, and packet drops.

Cisco AutoQoS performs the following functions:

WAN

- Automatically classify RTP payload and VoIP control packets (H.323, H.225 Unicast, Skinny, SIP, MGCP)
- Build service policies for VoIP traffic that are based on Cisco Modular QoS CLI (MQC)
- Provision Low Latency Queuing (LLQ)–Priority Queuing for VoIP bearer and bandwidth guarantees for control traffic
- Enable WAN traffic shaping that adheres to Cisco best practices, where required
- Enable link efficiency mechanisms, including such as Link Fragmentation and Interleaving (LFI) and RTP header compression (cRTP) where required
- Provide SNMP and SYSLOG alerts for VoIP packet drops

LAN

- Enforce the trust boundary on Cisco Catalyst switch access ports and uplinks/downlinks
- Enable Cisco Catalyst strict priority queuing (also known as expedite queuing) with weighted round robin (WRR) scheduling for voice and data traffic, where appropriate
- Configure queue admission criteria (Map CoS values in incoming packets to the appropriate queues)
- Modify queue sizes and weights where required

Q. Does CEF need to be enabled for Cisco AutoQoS on routers?

A. Yes. Cisco AutoQoS uses Network Based Application Recognition (nBAR) to identify various applications and traffic types; CEF is a prerequisite for NBAR.

Q. What are the minimum requirements for enabling Cisco AutoQoS on routers and switches?

A. Minimum requirements to enable Cisco AutoQoS for VoIP traffic on supported platforms for WAN interfaces:

- Configure an IP address on the interface or a sub-interface.
- Configure "bandwidth" under any participating interfaces or sub-interfaces. For ATM PVC, configure "vbr-nrt" under the PVC.

Minimum requirements to enable Cisco AutoQoS for VoIP traffic on supported LAN interfaces for switch platforms:

- CDP must be enabled
- PFC or PFC2 is required for "trust dscp" and "ciscosoftphone" keywords on the Cisco Catalyst 6500 switch
- The Enhanced Image (EI) is required on the Cisco Catalyst 2950 Series Switches

Q. What interfaces currently support Cisco AutoQoS?

A. Router platforms: Cisco serial (PPP/HDLC), Frame Relay DLCIs and ATM VCs on the router platforms

Switch Platforms: Ethernet, Static, Dynamic-access, Voice VLAN access, and Trunk ports

Q. What commands enable AutoQoS VoIP on routers and switches?

A. Router Platforms

```
Auto qos voip [trust | fr-atm]
```

Switch Platforms

- Catalyst 6500

```
Global command : set qos autoqos
Port based command : set port qos <mod/port> autoqos voip [ciscosoftphone | ciscoipphone]
Set port qos <mod/port > autoqos trust [cos | dscp]
```

- Catalyst 3550 & 2950EI

```
auto qos voip trust – QoS Labels in ingress packets are trusted
auto qos voip cisco-phone – Extends trust boundary if IP Phone detected
```

Q. Does the user need to consider any prerequisites or restriction prior to enabling Cisco AutoQoS?

A. Any pre-existing output QoS service policy that is already attached to an interface or PVC must be disabled before enabling Cisco AutoQoS. IP address and interface bandwidth must be configured, and CEF switching must be enabled. Once AutoQoS is turned on, SNMP traps generated by Cisco AutoQoS are delivered only if an SNMP server is explicitly enabled and the community string "AutoQoS" given write permissions. In case of low speed FR/ATM and Serial links, Cisco AutoQoS must be enabled on both ends of the connection to function correctly. Also, because the fragmentation parameters are derived from the bandwidth, the bandwidth parameter on both ends of the link must be identical.

For the switch platforms, it is recommended that any standard QoS commands configured on the router be deleted before issuing AutoQoS. CDP must be enabled on the interface on which AutoQoS is turned on.

Q. What traps does Cisco AutoQoS VoIP generate?
A. AutoQoS activates thresholds in the RMON alarm table to monitor drops in LLQ. By default, the drop threshold is set to 1bps.

Q. Which VoIP signaling protocols does Cisco AutoQoS VoIP identify?
A. Cisco AutoQoS VoIP currently identifies H.323, H.225 (Unicast only), SIP, Skinny and MGCP signaling protocols. The user can configure access-lists to identify additional signaling protocols.

Q. How does Cisco AutoQoS determine which QoS features to enable?
A. AutoQoS enables the required QoS based on Cisco best practice methodologies. nBAR dynamically discovers applications on the network, and automatically classifies them for appropriate QoS treatment. The network variables (ie: link type, interface bandwidth) are all considered when deciding upon the appropriate QoS features that need to be enabled. The parameters generated are tailored for optimal application performance, and are based on years of Cisco networking experience, extensive lab testing, and input from a broad base of customer AVVID installations.

Q. What happens if the user changes configuration parameters after AutoQoS is enabled on the interface?
A. Currently, the configurations generated by AutoQoS are static. If parameters are modified in these cases, Cisco AutoQoS needs to be disabled and re-enabled to take the new bandwidth into consideration for enabling the appropriate QoS parameters (ie: enabling header compression or deciding on the fragmentation size). Disable Cisco AutoQoS before changing these configuration parameters and then re-apply it again.

Q. Can the user change the parameters generated by Cisco AutoQoS?
A. Yes. The user can modify or fine-tune any of the parameters/configurations generated by Cisco AutoQoS.

Q. How do I disable Cisco AutoQoS? What configurations are deleted from router CLI when Cisco AutoQoS is disabled?
A. Issue a “no auto qos voip” command under the interface or VC to disable Cisco AutoQoS. All configurations generated by Cisco AutoQoS that have not been modified by the user will be deleted when it is disabled on a particular interface.

If the user has made any changes to the configurations generated by Cisco AutoQoS, it is recommended that the user manually delete those features after disabling Cisco AutoQoS. An exception is the policy-map and class-map configuration. Unless Cisco AutoQoS enabled on another interface, or a port is using the same modified class-map and policy-map definitions, these commands including the user made modifications will be deleted.

AVAILABILITY

Q. How and when will Cisco AutoQoS be available?

	Platforms	Software
Switches	Cisco Catalyst 2950EI Cisco Catalyst 3550	Cisco IOS Software Release 12.1(12c)EA1
	Cisco Catalyst 4500	Cisco IOS Software Release 12.1(19)E
	Cisco Catalyst 6500	Cisco Catalyst Operating System 7.5.1
Routers	Cisco 2600/2600-XM Series Cisco 3600 Series Cisco 3700 Series Cisco 7200 Series	Cisco IOS Software Release 12.2(15)T

Q. Are there any pricing considerations?

A. No. Cisco AutoQoS is not priced separately from Cisco IOS Software and Cisco Catalyst OS Software.

RESOURCES

Q. Where can I find more information?

A. For more information, please visit: http://www.cisco.com/go/qos/

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

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