



Introduction to QoS Features for Voice

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This module provides a high-level introduction to the Cisco IOS quality of service (QoS) features related to handling voice traffic. For complete conceptual and configuration information for each feature, see the modules or books referenced in the “[Additional References](#)” section on page 377.

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Information About QoS Features for Voice

This section contains the following concepts related to QoS features for voice:

- [Characteristics of Voice Applications, page 376](#)
- [QoS and Voice Feature Sets, page 376](#)



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Characteristics of Voice Applications

Real-time applications such as voice applications have different characteristics and requirements from those of traditional data applications. Because they are real-time-based, voice applications tolerate minimal variation in the amount of delay affecting delivery of their voice packets. Voice traffic is also intolerant of packet loss and jitter, both of which degrade unacceptably the quality of the voice transmission delivered to the recipient end user. To effectively transport voice traffic over IP, mechanisms are required that ensure reliable delivery of voice packets. Cisco IOS QoS features collectively embody these techniques, offering the means to provide priority service that meets the stringent requirements of voice packet delivery.

QoS and Voice Feature Sets

Cisco IOS software includes a rich set of features that enable you to deploy mechanisms that deliver QoS throughout your network.

Cisco IOS QoS for voice features are best deployed at different points in the network and are designed to be used in conjunction with other QoS features to achieve specific goals such as control over jitter and delay. Not all QoS for voice features are supported on all platforms.

The following are a few of the Cisco IOS features that address the requirements of end-to-end QoS and service differentiation for voice packet delivery:

- **Header Compression**—Used in conjunction with RTP and TCP, compresses the extensive RTP or TCP header, resulting in decreased consumption of available bandwidth for voice traffic. A corresponding reduction in delay is realized.
- **Frame Relay Traffic Shaping (FRTS)**—Delays excess traffic using a buffer, or queueing mechanism, to hold packets and shape the flow when the data rate of the source is higher than expected.
- **FRF.12 (and Higher)**—Ensures predictability for voice traffic, aiming to provide better throughput on low-speed Frame Relay links by interleaving delay-sensitive voice traffic on one virtual circuit (VC) with fragments of a long frame on another VC utilizing the same interface.
- **PSTN Fallback**—The PSTN Fallback feature provides a mechanism to monitor congestion in the IP network and either redirect calls to the PSTN or reject calls based on the network congestion.
- **IP RTP Priority and Frame Relay IP RTP Priority**—Provides a strict priority queueing scheme that allows delay-sensitive data such as voice to be dequeued and sent before packets in other queues are dequeued. These features are especially useful on slow-speed WAN links, including Frame Relay, Multilink PPP (MLP), and T1 ATM links. It works with weighted fair queueing (WFQ) and Class-Based WFQ (CBWFQ).
- **IP to ATM Class of Service (CoS)**—Includes a feature suite that maps QoS characteristics between IP and ATM. Offers differential service classes across the entire WAN, not just the routed portion. Gives mission-critical applications exceptional service during periods of high network usage and congestion.
- **Low Latency Queueing (LLQ)**—Provides strict priority queueing on ATM VCs and serial interfaces. This feature allows you to configure the priority status for a class within CBWFQ and is not limited to User Datagram Protocol (UDP) port numbers, as is IP RTP Priority.
- **Multilink PPP (MLP)**—Allows large packets to be multilink-encapsulated and fragmented so that they are small enough to satisfy the delay requirements of real-time traffic. MLP also provides a special transmit queue for the smaller, delay-sensitive packets, enabling them to be sent earlier than other flows.

- **QoS Policy Propagation via Border Gateway Protocol (BGP)**—Leverages BGP to distribute QoS policies to remote routers in your network. It allows you to classify packets and then use other QoS features such as Committed Access Rate (CAR) and Weighted Random Early Detection (WRED) to specify and enforce business policies to fit your business model.
- **Resource Reservation Protocol (RSVP)**—Supports the reservation of resources across an IP network, allowing end systems to request QoS guarantees from the network. For networks supporting Voice over IP (VoIP), RSVP—in conjunction with features that provide queueing, traffic shaping, and voice call signaling—can provide call admission control for voice traffic. Cisco also provides RSVP support for LLQ and Frame Relay.

Where to Go Next

Decide which of the QoS feature for voice you want to use in your network and see the corresponding module of the *Cisco IOS Quality of Service Solutions Configuration Guide*, the *Cisco IOS Wide-Area Networking Configuration Guide*, the *Cisco IOS IP Routing Protocols Configuration Guide*, or the Cisco IOS Voice Configuration Library. See the “[Related Documents](#)” section below.

Additional References

The following sections provide references related to QoS features for voice traffic.

Related Documents

Related Topic	Document Title
Header compression	“ Header Compression ” module in the “ Link Efficiency Mechanisms ” part of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.4.
FRTS	<i>Cisco IOS Wide-Area Networking Configuration Guide</i> , Release 12.4.
FRF.12 (and higher)	<i>Cisco IOS Wide-Area Networking Configuration Guide</i> , Release 12.4.
PSTN Fallback	Cisco IOS Voice Configuration Library
IP RTP Priority and Frame Relay IP RTP Priority	“ Congestion Management Overview ” module of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.4.
IP to ATM CoS	“ Part 7: Quality of Service Solutions ” of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.4.
LLQ	“ Congestion Management Overview ” module of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.4.
MLP	“ Reducing Latency and Jitter for Real-Time Traffic Using Multilink PPP ” module of the “ Link Efficiency Mechanisms ” part of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.4.
QoS Policy Propagation via BGP	<i>Cisco IOS IP Routing Protocols Configuration Guide</i> , Release 12.4.
RSVP, Including RSVP Support for LLQ and Frame Relay	“ Part 5: Signalling ” of the <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> , Release 12.4.

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