telchemy
Actively managing multimedia®

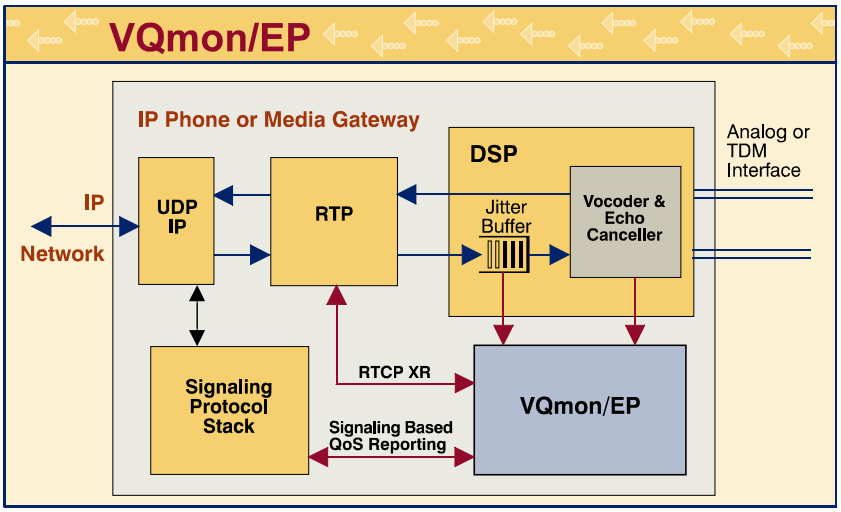
VQmon®
EP

VQmon® is the leading Voice over IP performance management technology used in IP phones, gateways, probes, analyzers, switches, and routers to monitor service quality in real time. VQmon is the first technology to detect and measure transient IP problems and to assess their effect on perceptual quality.

VQmon/EP (End Point), when integrated into IP phones and media/trunking gateways, generates the performance metrics necessary to support management and QoS reporting protocols and to diagnose problems. VQmon/EP is available as fast, compact, and efficient ANSI C source code.

Key Features:

- Call quality metrics generated in real time
- Listening and conversational quality MOS and R-factor scores
- Supports key international standards including ITU-T P.564, ITU-T G.107, ITU-T G.1020, ETSI TS 101 329-5 Annex E, IETF RFC 3611, IETF RFC 6035
- MOS-LQ and MOS-CQ with ACR, ITU, and Japanese TTC scaling
- Average metrics for whole call, along with separate metrics for good and bad periods
- RTCP XR payload generation and parsing
- Generates SIP RTCP Summary Reports (RFC 6035)
- Metrics for H.460.9 Annex B, H.248.30, G.799.1, and key QoS reporting protocols
- Alerts generated in real time if quality degrades
- Compact, efficient, portable ANSI C source code (or object code library)



VQmon/EP comprises two modules: the VQmon Core Module and VQmon Markov Model (VMM) .

The VQmon Core Metrics Module is typically integrated with the protocol stack and controller software. This module uses packet metrics obtained from the VMM module along with signal, noise, and echo level information obtained through typical DSP APIs to calculate a rich set of metrics and diagnostic data. The module only needs to be executed when a QoS report is required—typically every 20-30 seconds, or at the end of a call. VQmon calculates listening quality and conversational quality metrics using a highly optimized algorithm that considers time-varying IP impairments (typically caused by network congestion), providing greater accuracy and more insight into the effects of transient IP network problems.

The VQmon Markov Model (VMM) interacts with the jitter buffer, monitoring packet loss and discard events and measuring their distribution using a 4-state Markov Model. The VMM may be directly integrated with the jitter buffer in either DSP or controller software or may interact with the jitter buffer on a polled basis. VQmon Enabled™ DSP software, available from several leading codec vendors, has the VMM preinstalled for easier integration of VQmon.

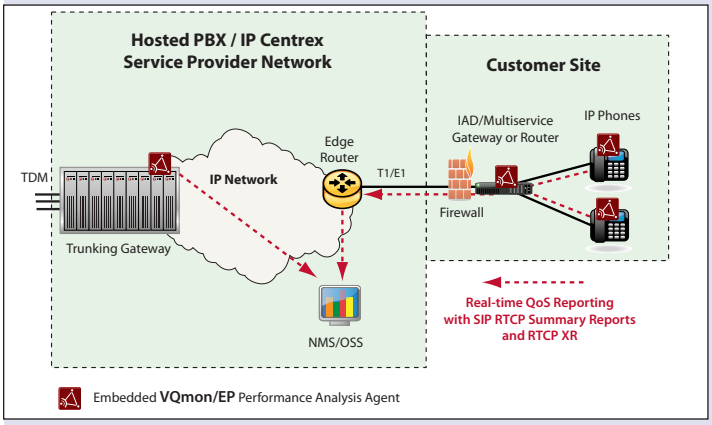
VQmon/EP generates and interprets RTCP XR (RFC3611) payloads, generates SIP RTCP Summary Reports (RFC 6035), and provides the metrics needed for signaling-based QoS reports such as H.460.9 Annex B. These metrics support key management requirements for service provider and enterprise IP telephony applications. VQmon/EP and RTCP XR help expose problems related to echo, network congestion, endpoint configuration, and other system problems, making problem diagnosis faster and easier.

VQmon/EP supports real-time thresholding and generates internal function callbacks when call quality degrades below threshold for a specified interval. IP phone and gateway designers can use this feature to generate external events, such as SNMP traps, or to trigger configuration changes that automatically resolve quality problems.

Fast, efficient, and highly portable, VQmon/EP minimizes implementation time and cost. VQmon/EP is fully compatible with Telchemy's other performance management products including SQprobe® and SQmediator®, as well as a wide range of VoIP test equipment.

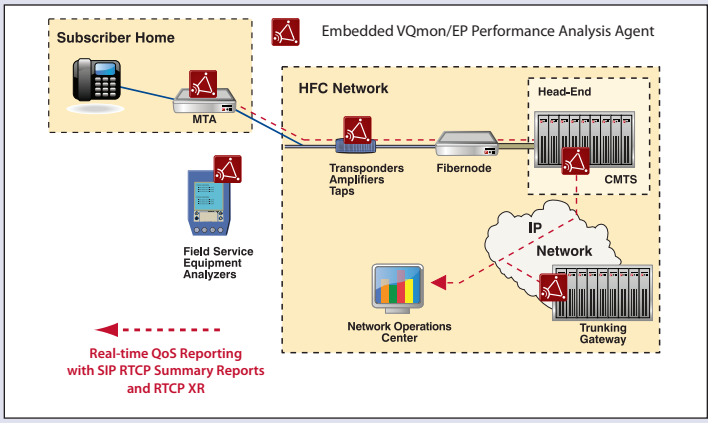
Applications

IP Phone – Enterprise IP Telephony or Hosted PBX



VQmon/EP is ideal for integration into IP phones to support Enterprise or Hosted PBX applications. VQmon/EP monitors the quality of each call and provides real-time feedback on service quality through SIP RTCP Summary Reports and RTCP XR..

MTA for Cable Telephony Service



Cable service providers need to monitor service quality in subscriber homes to minimize "truck rolls." VQmon/EP can be integrated directly into MTAs to monitor live or test calls and provide feedback through SIP RTCP Summary Reports and RTCP XR.

Technical Specifications

- Supports key international standards including ITU-T P.564, ITU-T G.107, ITU-T G.1020, ETSI TS 101 329-5 Annex E, IETF RFC 3611, IETF RFC 6035
- Measures perceptual effects of burst packet loss and recency
- Supports Japanese TTC JJ201.01 VoIP monitoring requirements
- Produces and interprets RTCP XR (RFC 3611) VoIP metrics payloads
- Produces SIP RTCP Summary Reports (RFC 6035)
- Produces VoIP metrics for:
  - ITU-T H.460.9 Annex B, QoS Reporting for H.323
  - ITU-T H.248.30, QoS Reporting for Megaco
  - ITU-T G.799.1 VoIP Trunking Gateway
  - IETF SIP rtcp xr Events draft
  - IETF RTCP XR MIB draft

Call Quality Metrics

- Listening and conversational quality MOS scores with ACR, ITU and TTC scalings – MOS-LQ, MOS-CQ
- Listening and conversational quality R -actors – R-LQ, R-CQ
- Separate R-factors for burst and gap conditions – R-Burst, R-Gap

IP/RTP Metrics

- Packet loss rate, packet discard rate, burst length/density, gap length/density

Degradation Factors

- Percentage degradation due to loss, jitter, codec, delay, signal level, noise level, echo, recency

Codecs Supported

- G.711, G723.1, G.726, G.728, G.729/A, GSM, FR, EFR, etc.

Implementation Requirements

- Software language – ANSI C
- Code size – Approximately 40 kilobytes
- API – VQmon/EP API
- OS/RTOS – Minimal OS dependency
- Processor – Generic 32-bit integer processor
- CPU load – Approximately 200 IPS per active call, at 1% packet loss rate
- RAM – Approximately 500 bytes per active call

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