

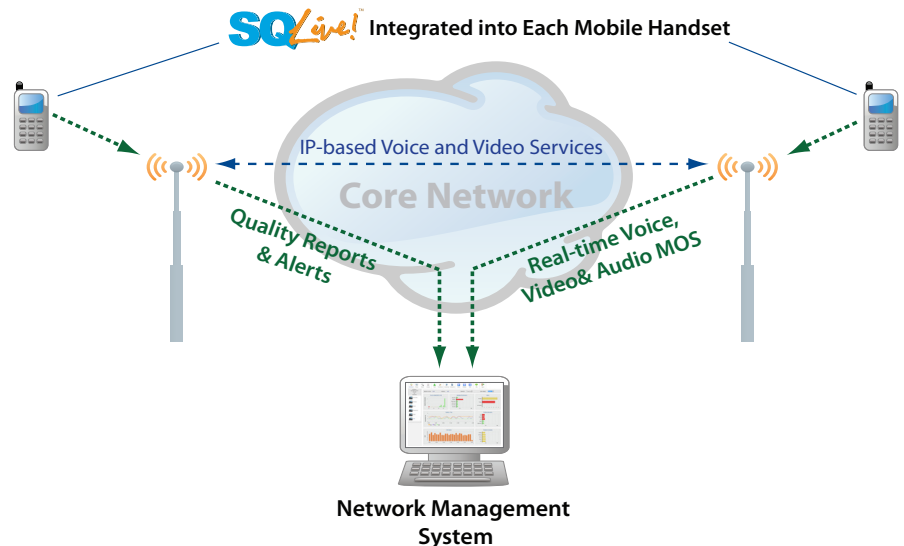
**SQLive!**™ is a breakthrough performance monitoring software application for IPTV, IP videoconferencing, and Voice over IP based on Telchemy's industry-leading VQmon® performance analysis technology.

SQLive is a compact, robust application that can be integrated into mobile handsets\*, customer premises equipment (CPE), test equipment (probes and analyzers), telepresence and IP videoconferencing equipment, routers, switches, DSLAMs, PCs/servers, and a wide range of other devices. SQLive is small enough to run in a mobile handset or IPTV set-top box, but also powerful enough to monitor multiple high definition (HD) video streams.

SQLive has the ability to analyze the quality of standards-based encrypted video streams without decoding, avoiding problems related to privacy and digital rights management (DRM). Providing real-time video Mean Opinion Scores (MOS) and a rich set of diagnostic metrics, SQLive gives service providers and enterprise network managers a clear view of the quality and performance of every IP video session in the network.

## Key Features

- Analyzes both encrypted (scrambled) and unencrypted video streams
- Provides accurate, real-time video MOS (MOS-V) and an extensive set of QoE/diagnostic metrics
- Reports both Absolute and Relative MOS-V
- Compact code size (< 500 KB)
- Low per-stream processing overhead
- Suitable for use in mobile handsets, IPTV set-top boxes, home gateways, and other end system network devices
- Runs as standalone application on Linux, Windows, BSD, and other platforms
- Extracts high-level content information (levels of motion/detail) and generates alerts if abnormal content (e.g., frozen or blank video) is detected
- Supports a wide range of transport protocols and video/audio codecs
- Analyzes RTP and MPEG2-TS streams and detects lost packets, delay variation (jitter)
- Detects Group of Pictures (GoP) structure, identifying individual I, B, and P frames and performing per-frame quality computation
- Reports TR 101 290 MPEG Transport Metrics



## SQLive used for Mobile VoIP & IP Video Performance Monitoring

IPTV and IP videoconferencing services are prone to various types of quality problems that can occur during the encoding/decoding process and during transmission across the IP network. These problems are often transient, making them difficult to detect and reproduce. To ensure the high quality of IP video services, it is essential that service providers and network managers have the ability to monitor the performance of every video session.

SQLive is a drop-in software solution providing real-time monitoring and analysis of IP video sessions at the mobile handset, customer premises and other key locations throughout the service network.

SQLive uses integrated VQmon technology to analyze RTP and MPEG-2 Transport video streams—both scrambled and unscrambled—and reports highly accurate perceptual quality and diagnostic metrics, including video MOS, for every monitored stream.

\*Applications that require access to the raw packet stream on mobile handsets, such as SQLive, must be run as root or as a user with elevated privileges, or can be preinstalled into the mobile phone software image by the handset manufacturer.

## Fast, Precise Perceptual Quality Scores

Measuring video quality accurately can be difficult, for a number of reasons:

- Video has a complex frame structure, and the same rate of packet loss may cause severe quality degradation or may not even be visible, depending on which frame types are affected. Packet loss alone is therefore not a reliable indicator of video perceptual quality.
- The visibility of quality problems also depends partially on the video content; for example, frame freezes tend to be more noticeable during high motion scenes (such as a sporting event) than during static scenes.
- Scrambling/encryption is commonly applied to video streams, for privacy or digital rights management (DRM) enforcement. This makes accurate performance analysis difficult, as the frame structure and content are hidden by encryption.

SQLive is designed to consider each of these factors, ensuring a high degree of accuracy in the MOS scores reported. SQLive identifies individual I, B, and P frames in the GoP and calculates the effects of impairments, such as packet loss, on each frame. It performs high-level content analysis, measuring levels of motion and detail and detecting scene changes, and generates alerts if abnormal content (such as a frozen frame, blank or "noisy" video) is detected. And unlike other performance monitoring solutions, SQLive is able to detect frame structure and content information in encrypted IP video streams without decoding.

## SQLive Applications

### IPTV

SQLive can be easily installed into the set-top box or home gateway at each subscriber premises, providing real-time quality feedback to service providers for every IPTV video session. SQLive can be used together with Telchemy's **SQprobe**® for mid-stream monitoring on the service provider side of the network, ensuring the consistency of reported metrics and making it easier to determine precisely where in the network problems are occurring. With its advanced thresholding and alerting capabilities, SQLive can provide early warning of performance issues—in many cases, even before QoE for subscribers is affected.

### IP Videoconferencing

SQLive provides real-time quality monitoring of IP videoconferencing services, and can be integrated into videoconferencing/TelePresence equipment, mobile handsets, and desktop video player software. Perceptual quality and diagnostic metrics are provided continuously to a management application such as Telchemy's SQmediator® or DVQattest® Controller, which can be integrated with third-party network management / operational support systems (NMS/OSS) via a Web Service API.

## Technical Specifications

### Supported Video Codecs

- MPEG-1, MPEG-2, MPEG-4
- M-JPEG
- H.261, H.263, H.263+, H.264
- Microsoft VC-1
- On2 TrueMotion VP6

### Supported Audio Codecs

- MPEG-1 Layer 2, Layer 2, and Layer 3A
- MPEG-2 Advanced Audio Coding
- MPEG-4 Advanced, Low Delay, and High Efficiency Audio Coding
- AC-3 (Dolby Digital)
- Windows Media Audio Professional

### Supported Voice Codecs

- Over 60 voice codecs are supported, including:
- G.711, G.723.1, G.726, G.728, G.729/A/E
  - GSM, SX7300/8300/9600, Wideband Linear PCM
  - QCELP, EVRC, SMV, AMR, iLBC, Speex
  - Broadcom, AMBE2Plus, Microsoft RTAudio

### Supported Transport Protocols (Media Stream Types Monitored)

- RTP (RFC3550)
- MPEG-2 Transport Stream (MPEG2-TS)

### Supported Signaling Protocols

- SIP Call Control Messages
- SIP Performance Metrics

### Supported Platforms

- Windows (2000/XP/Vista/7)
- Red Hat Linux v5.x or higher
- Embedded Linux devices (set-top box)
- Android (SQLive on a mobile platform requires elevated or root privileges, or can be preinstalled into the mobile phone software image by the handset manufacturer)



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