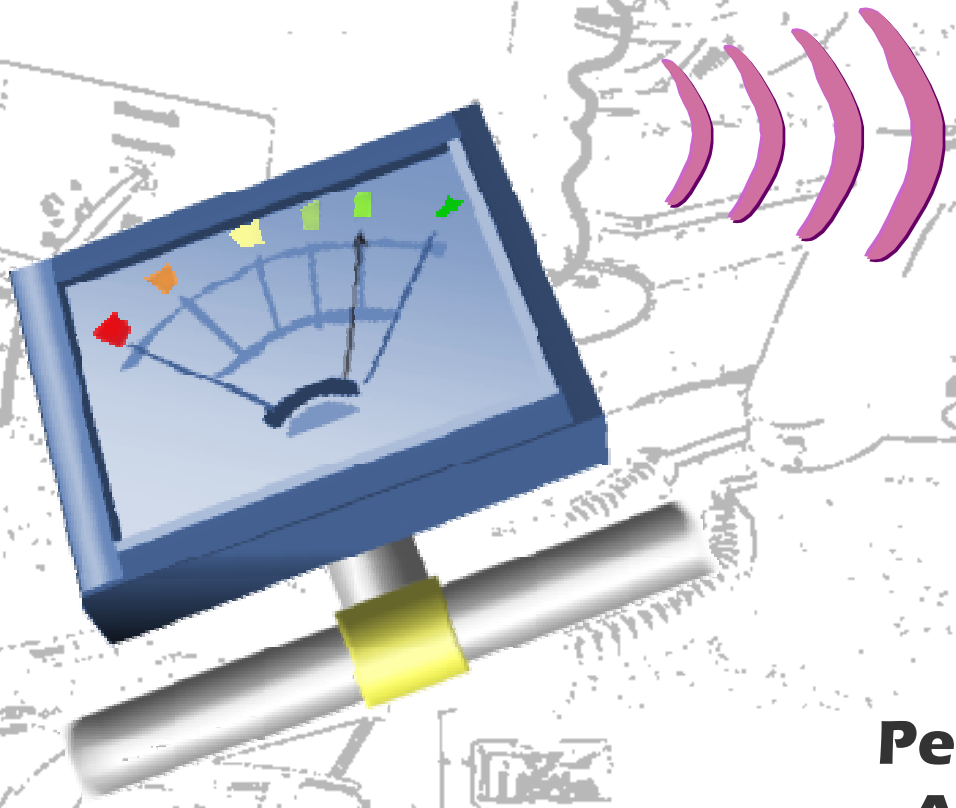
Malden Electronics

VoIP Monitor Professional



Speech Performance Assessment

Product Brochure

Product Overview

VoIP Monitor Professional is a software tool for non-intrusive assessment of speech quality and measurement of RTP/RTCP traffic parameters in VoIP networks. VoIP RTP packets arriving at a media gateway are subject to timing variations as well as loss and miss-sequencing. VoIP Monitor analyses the RTP traffic to produce **real-time** useful statistical data and predictions of speech quality across a single call or a number of calls. A calibration file, tailored to the gateway or VoIP terminal refines the speech quality prediction and gives a better correlated Mean Opinion Score (MOS) value than any other monitoring method. VoIP Monitor Professional is a maintenance and network monitoring tool designed specifically for operators of public and corporate VoIP networks as well for companies developing and testing media gateways and other VoIP network components.

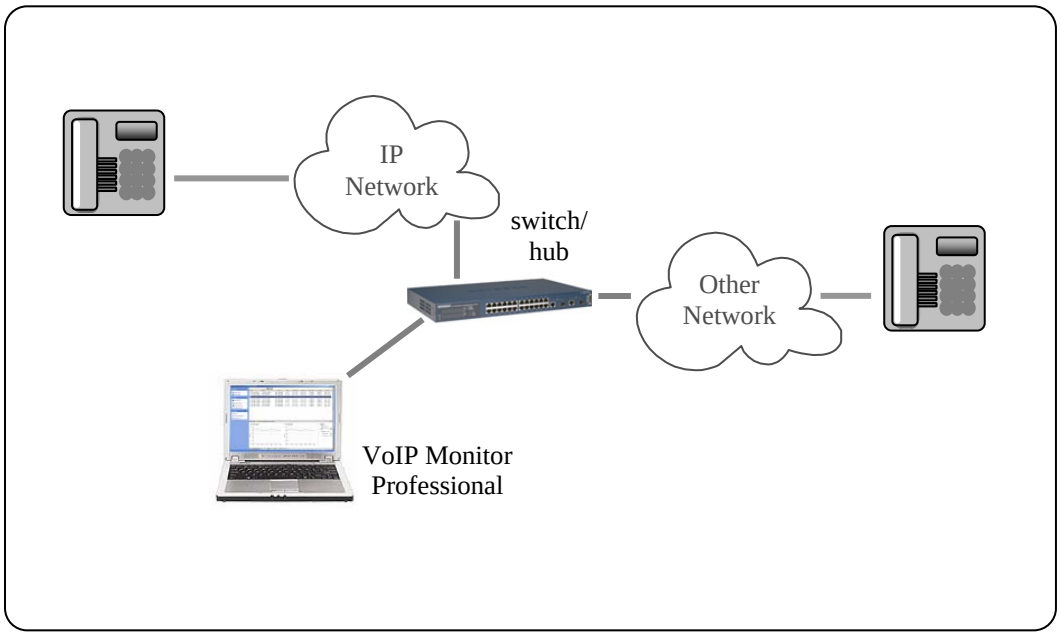
VoIP Monitor Professional

VoIP Monitor Professional analyses the Voice over IP traffic by monitoring live RTP/RTCP traffic streams. The performance of a VoIP transmission network can be characterised mainly in terms of **Packet Loss** and **Jitter**. Packet loss can degrade speech quality but effective packet loss concealment can cover up these degradations. Jitter can also affect speech quality if it exceeds the capacity of the jitter buffer or the dynamic jitter buffer algorithm is inadequate. The jitter buffers, codecs and packet loss concealment techniques influence the speech quality in IP phones and gateways differently and there are wide variations between brands, models and software versions. For these reasons it can be misleading to use these RTP/RTCP statistics alone to predict the speech quality performance of a VoIP connection. **VoIP Monitor Professional** can take account of the influence of codec distortion and inadequacy of a dynamic jitter buffer or packet loss concealment. This increases the accuracy of speech quality prediction with better correlation to MOS. This high accuracy MOS prediction can be performed in real-time on more than 500 RTP streams or 250 calls at the same time. MOS, jitter and packet loss trends are presented graphically on the VoIP Monitor screen. The Diagnostics feature gives additional information about the percentage impact each parameter has on the degradation of speech quality as well as indicating where the network problems lie.

Plug-n-Monitor!

A Windows PC with **VoIP Monitor Professional** software provides a straightforward approach to monitoring key IP performance parameters and MOS prediction in a VoIP network. Most important of all is the absolute simplicity of connection, setting up and using **VoIP Monitor Professional.** The product is highly suited to installation, maintenance and service engineers verifying network performance and Service Level Agreement parameters of a VoIP service.

Typical Network Application



Powerful Features

VoIP Monitor Professional is a new approach to speech quality monitoring. With **VoIP Monitor Professional,** it is easy to observe the performance of the VoIP Network and to predict MOS for a particular VoIP call or as an average for a group of VoIP calls. Based on Malden Electronics' long experience in speech performance assessment, **VoIP Monitor Professional** offers these outstanding features:

- Requires an absolute minimum of configuration: **Plug-n-Monitor!**
- Provides all the data needed to ensure efficient VoIP network operation, without needing high-level competence in speech quality assessment.
- Expertly predicts the experience of users by calculating Mean Opinion Score. MOS is derived from an analysis of jitter and packet loss and "calibrated" using a calibration file representing the impairments of the particular VoIP telephones and gateways in use.
- Passive monitoring technique presents no security threat to the network being monitored.
- Call identification and grouping, by IP address and IP address groups.
- Traffic statistics per each call and per call groups.
- Indication of MOS, jitter, packet loss, speech level, measurement duration, codec used, codec settings, number of packets
- Graphical presentation of quality trends (MOS, jitter, packet loss) for each direction of a call.
- Calibration files to optimise MOS predictions

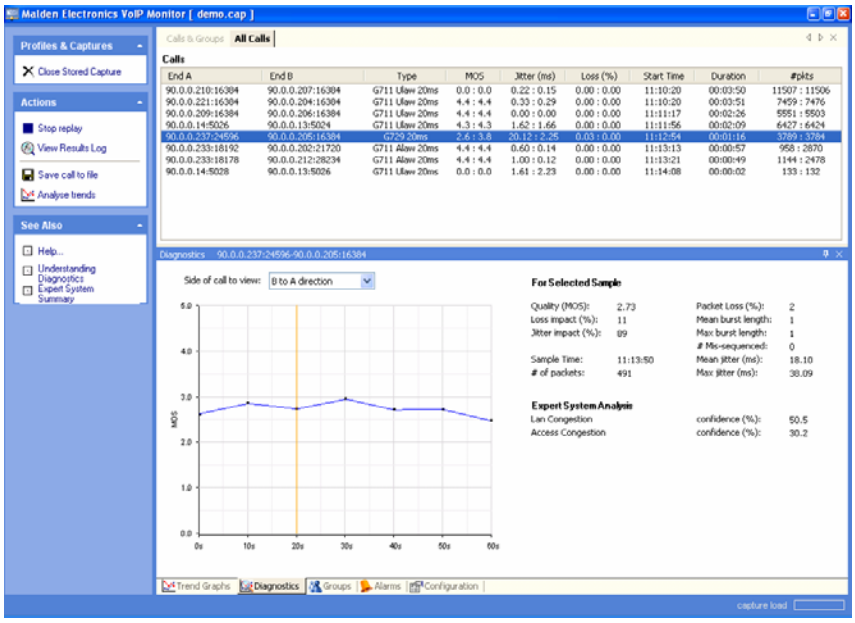
Powerful Features, cont.

- P.862 calibrated MOS and E-Model outputs
- Delay estimate
- Diagnostics - Expert System Analysis to suggest likely problem areas and impacts.
- Alarm management with thresholds for SLA monitoring
- Continuous, passive monitoring of more then 250 simultaneous live VoIP calls.
- Unlimited support for multi-vendor networks
- Data aggregation and summary with logging.
- Call monitoring and call recording (subject to codec availability).
- Advanced measurements with max/min packet loss and jitter, codec changes, frame size changes, packet loss due to jitter, speech level, jitter & packet loss degradation.
- Recommended as an easy-to-use and powerful tool for any engineer doing installation, maintenance, monitoring and SLA management of VoIP Networks.

Clear, Multi-Function Display

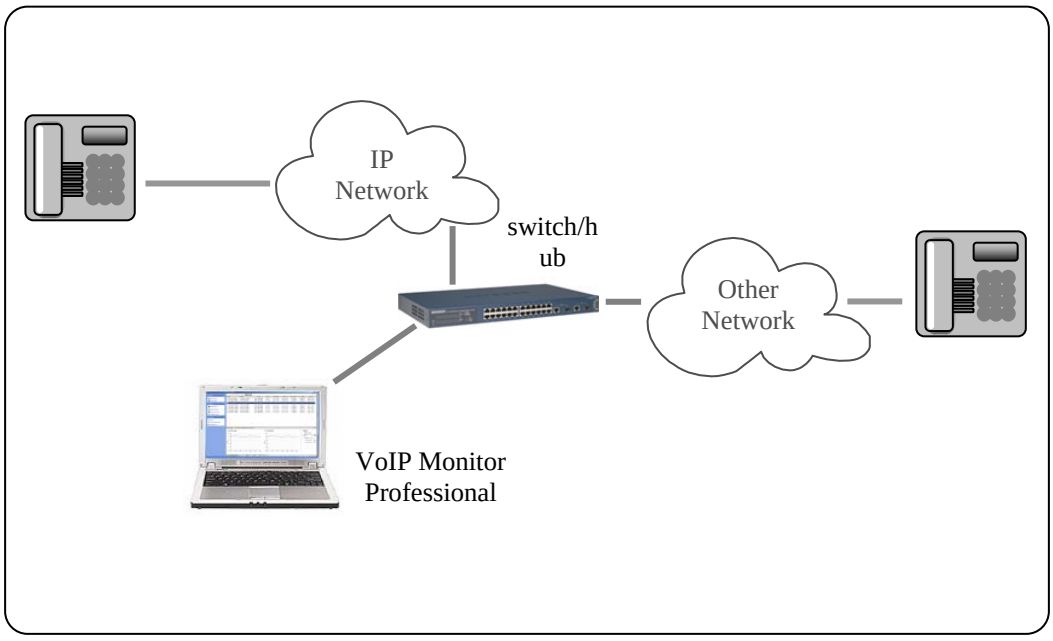
VoIP Monitor Professional has been designed for absolute ease of use. A clearly ordered user interface with Action Panel, Function Tabs and Results Panels supports rapid learning. Starting or stoping capture, selecting a call to analyse, navigating through results and settings are all intuitive and require virtually no learning time.

Long-term and Snapshot Performance Data with Diagnostics



Use **VoIP Monitor Professional** to examine "snapshot" results, or to observe trends over long periods. Log results to disk, save captured speech files or save packet stream capture for later replay and analysis. The Diagnostics window offers Expert System Analysis giving a detailed picture of the impact on speech quality impacts due to jitter, packet loss, network congestion, wrong codec setting or other impairments.

Connection to Ethernet Network



VoIP Monitor Professional installed on a PC or Notebook can be connected very easily to any Ethernet network via a hub or via a monitoring port on a switch. A hub contains multiple ports. Packets arriving at one port are copied to the other ports so that all segments of the LAN can see all packets. When VoIP Monitor is connected to a hub it will see all packets travelling between any other ports. If some of these packets belong to VoIP calls then it is able to analyse these calls. A switch needs to be configured to create a monitoring port to see any traffic on other ports.

Calibration

VoIP Monitor Professional uses a "Generic Calibration File" for MOS evaluation. This represents an average performance of ten devices from leading equipment manufacturers. The accuracy of the MOS correlation can be improved by about 10% if an individual end-device calibration file is being used. Malden Electronics offers a large library of calibration files for many media gateways and VoIP terminals. Calibration files for other equipment may be supplied on request or can be developed by the customer using Malden's Digital Speech Level Analyser (DSLA).

Recommended Configuration

System specification directly affects the number of simultaneous calls monitored. To monitor 500 streams the following minimum specification is recommended:

- Windows 2000 / XP
- Pentium 4 2.6GHz
- 512 MB RAM
- 100 Mbps Ethernet NIC

Higher processor power and larger memory increases the number of streams that can be monitored.

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