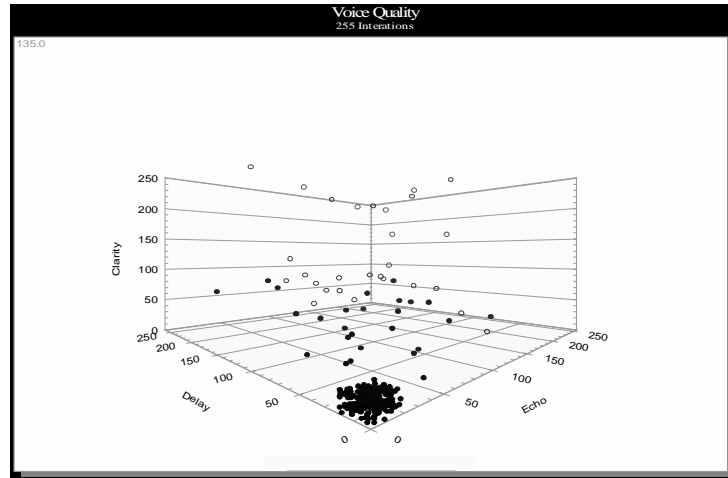


Agilent Technologies

IP Telephony Reporter J5422A Product Overview



IP Telephony Reporter

The IP telephony test offerings from Agilent provide a cohesive solution for laboratory evaluation of VoIP gateways and subsystems and for the installation and commissioning of IP Telephony services. The Agilent Voice Quality Tester (VQT) allows the user to make End-to-End measurements of delay, objective voice quality and echo. Should any of the results be unacceptable, the VQT can troubleshoot the circuit switched network and the Agilent Advisor IP Telephony Analyzer can be used to isolate problems inside the packet network.

Currently these two sources of information are derived from the two separate products. The IP Telephony Reporter Software brings these independent test results together in a single report.

The three important measurements produced by the VQT - delay, objective voice quality and echo - are plotted on an innovative, 3D graphical display. This gives the reader an instant impression of overall voice quality as experienced by the listener. Other reports show voice quality measurements' time correlated to impairments and traffic levels on the packet network. This allows the reader to see empirically which conditions on either the circuit switched or packet switched networks are affecting the users' experience of voice quality.

Key Features

- Time correlated measurements from the Agilent Advisor and the Agilent VQT (Voice Quality Tester)
- Innovative 3D visualization shows overall voice quality at a glance
- Voice Quality is correlated to IP impairments such as jitter, packet loss and delay.
- Gateway performance in real or simulated IP networks is documented automatically
- VoIP readiness of operational networks under the business daily cycle is recorded and reported.
- Windows® NT, Windows® 98/2000 Support
- Automatic production of color Graphical Reports at the Push of a Button



Using the IP Telephony Reporter in the Laboratory

The main test activity of the IP Telephony Laboratory is to characterize the performance of gateways. DSP's (Digital Signal Processors) inside gateways are shared across multiple voice sessions. Gateways also implement packet loss concealment in different ways. These must be evaluated to select the optimum gateway for a given network environment. Configurations must be exercised in order to propose the correct gateway settings for codec type, packet length and de-jitter buffer depth.

All testing is intended to optimize the design and configuration of a gateway to achieve acceptable voice quality during high load and impaired IP network conditions. The ideal method to measure and analyze voice quality and IP network behavior is to use a combination of the Agilent Advisor Voice Personality and the Voice Quality Tester. The Agilent Advisor gives real time measurements of voice packet loss and jitter plus full featured statistics, protocol decodes and expert analysis of voice and data over IP networks. The Voice Quality Tester not only gives repeatable, objective measurements of voice quality, end to end delay and echo but also correlates this with full analysis of the circuit switched network.

All relevant measurements from both instruments are neatly pulled together in the IP Telephony Reporter to give concise documentation of gateway performance. Specifically, the ability of a gateway to deliver toll quality voice when operating in a network suffering high packet loss, jitter latency or reduced bandwidth is recorded.

Using the IP Telephony Reporter in Operational Networks

Enterprise data networks have been built to accommodate data applications. Such applications are supported by computers which use communication protocol stacks designed to control asynchronous data. Accordingly, if packets are held up in the network or arrive in the wrong order, the end devices can reorder them and present them to the application as a coherent block. In contrast, voice packets must arrive in the correct order and in a timely fashion with controllable delay variation. VoIP end points have only limited time to reorder packets, remove jitter and conceal packet loss before delivering the real-time voice to the human ear.

The complex interaction between data and voice packets on an operational network is something difficult to simulate in a laboratory. The data network already exists in many cases and the two questions to be answered are:

- How will the addition of voice traffic to the enterprise network impact response times and throughput of existing data applications?
- Will the listening experience of VoIP users match the voice quality of the legacy telephone network when voice packets are competing for bandwidth with the data applications?

The full range of operational network usage patterns can only be measured through monitoring over long periods of time. Peak utilization of the network by data applications or voice services occur only at certain times of the day or week. Accordingly, a VoIP readiness survey of a network must run for such periods of time.

The IP Telephony Reporter is ideal, giving a single report of voice quality versus network utilization, frame errors, jitter and packet loss. This is achieved by importing result files from both the Agilent Advisor and the Agilent Voice Quality Tester (VQT), synchronizing timing information and displaying the measurements together on customized graphs.

Measurements Used to Compile Reports

The IP Telephony Reporter offers three groups of reports.

Voice Quality Instant 3D Overview

The first graph gives an overview representation of voice quality, comprised of 3 factors: voice clarity, end to end round trip delay and echo. Voice clarity is offered as any of the following:- PSQM, PSQM Trend, PAMS or PAMS Trend. PSQM is an objective measurement of speech quality standardized in the ITU-T recommendation P.861 and primarily intended to characterize speech codecs. PAMS is an objective measurement of speech quality designed by British Telecommunications. PAMS was intended from inception to address speech quality in packet networks and includes parameters to isolate long breaks in received data due to packet loss.

The VQT Supports all relevant parameters of echo measurement – see below for more details. However, the Voice Quality Instant 3D Overview report uses a measurement known as PACE. Designed by Agilent, PACE (Perceived Annoyance Caused by Echo) is effectively a PSQM score of the echo heard by the speaker.

These three measurements are combined into an innovative, new 3D Graphic devised by Agilent to give an instant view of overall voice quality. Once the results from a VQT log file have been imported into the IP Telephony Reporter, the 3D graphic can be rotated within the IP Telephony Reporter application to show the best distribution of all point results - clarity, delay and echo over the chosen time period.

Detailed Reports of Voice Quality Measurements

The VQT gives detailed measurements characterizing voice quality. These measurements allow IP Telephony engineers to analyze the trends in voice quality, detect correlation between poor voice quality and other impairments and measure the proportion of time voice quality is inferior to defined thresholds.

These detailed measurements are displayed using a traditional 2D Graphic. The quantities available to this graphic are given below:

- Clarity – PSQM Average and Standard Deviation, Outliers %, Loss/Gain
- Clarity – PAMS Average LQS & LES, LQS and LES Exceeded
- Delay – Minimum; Average, Maximum and Standard Deviation
- Echo – Echo in Speech (ms), Echo in Silence (ms), Echo Delay (ms), Echo Free (%)– (Includes display of threshold used) and echo PACE

For more details on the specifications and applications of these measurements, consult the VQT technical data sheet.

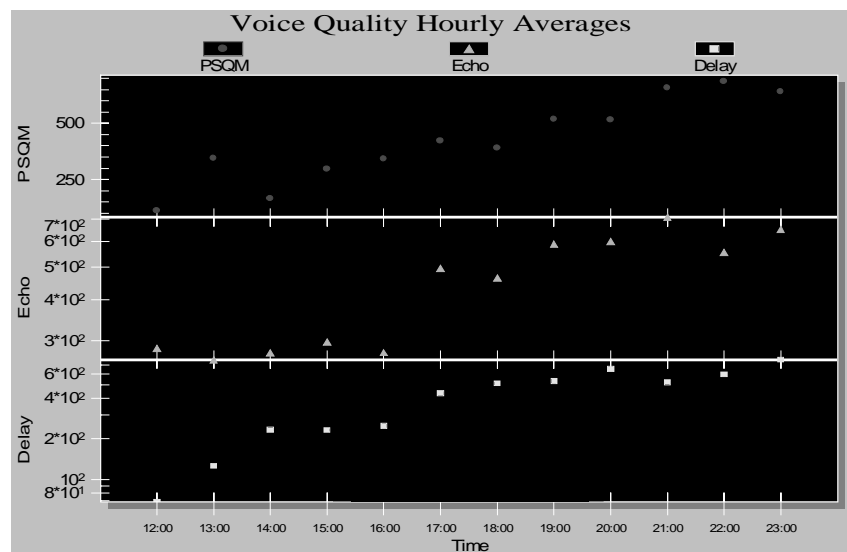
Quantities for Time Correlated Graphic Reporting

The third type of report plots three selected quantities versus time. The time duration and interval can be selected, as in the previous graphics. The three quantities are correlated with each other using the absolute timing information from the respective VQT log and Advisor .Dat files. This allows a symptom, such as poor voice clarity or long latency to be matched with high network utilization or large packet loss. The measurements offered for this report are as follows:

- Delay, Echo – PACE, clarity, (PSQM or PAMs)
- Measurement: Utilization (selectable as % utilization, throughput [kbps] or packets/sec)
- Bad Ethernet frame FCS and the RQM Measurements: % Packet Loss and Jitter.

Reports can be selected with the following measurement groupings:

- | | | | |
|-----|---------|-------------|---|
| 1. | Clarity | Packet Loss | Jitter |
| 2. | Clarity | Packet Loss | FCS Errors |
| 3. | Clarity | Packet Loss | Utilization (selectable as kbps, % utiln or pkts/sec) |
| 4. | Clarity | Jitter | FCS Errors |
| 5. | Clarity | Jitter | Utilization (selectable as kbps, % utiln or pkts/sec) |
| 6. | Delay | Packet Loss | Jitter |
| 7. | Delay | Packet Loss | FCS Errors |
| 8. | Delay | Packet Loss | Utilization (selectable as kbps, % utiln or pkts/sec) |
| 9. | Delay | Jitter | FCS Errors |
| 10. | Delay | Jitter | Utilization (selectable as kbps, % utiln or pkts/sec) |
| 11. | Clarity | Delay | Packet Loss |
| 12. | Clarity | Delay | Jitter |
| 13. | Clarity | Delay | FCS Errors |
| 14. | Clarity | Delay | Utilization (selectable as kbps, % utiln or pkts/sec) |



System Requirements

Data Collection

J1981A Telegra R with software release 4.0
J4630A Advisor VQT Undercradle with software release 4.0
Agilent Advisor with IP Telephony Analyzer comprising:
J3444C/D Fast Ethernet Mainframe LAN Advisor
or
J2300C/D WAN mainframe WAN Advisor
and
J3444A Fast Ethernet Undercradle
Installed with
J4618B or J4618C IP Telephony Analyzer Software

Data Analysis

- Intel Pentium® class CPU or greater
- Microsoft Windows® 98, NT 4.0, 2000, Me
- CD-ROM
- 20MB free disk space
- 20MB memory RAM space
- Microsoft Windows® supporting 800x600 pixel 256 color printer

Related Literature

Telegra R - VQT J1981A and VQT Undercradle J4630A	Product Overview	5968-7723E
TelegraVQT	Technical Specification	5968-8811E
Agilent Advisor LAN	Product Overview	5980-0990E
Agilent Advisor WAN	Product Overview	5967-5566E
Agilent Advisor ATM/WAN	Technical Specifications	5980-0786E
Agilent IP Telephony Analyzer J4618C	Product Overview	5988-2264EN
Agilent Advisor	Brochure	5980-1093E

Warranty

Hardware: 1 year warranty
Software: 90 day replacement only

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Notes _____

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Agilent Ordering Information

J5422A IP telephony reporter data analysis software

Warranty and Support Services

Software 90-day media replacement warranty

By internet, phone or fax, get assistance with all your Test and Measurement needs.

Online assistance:

<http://www.agilent.com/find/assist>

United States:

(Tel) 1 800 452 4844

Canada:

(Tel) 1 877 894 4414

(Fax) (905) 282 6495

China:

(Tel) 800-810-0189

(Fax) 1-0800-650-0121

Europe:

(Tel) (31 20) 547 2323

(Fax) (31 20) 547 2390

Japan:

(Tel) (81) 426 56 7832

(Fax) (81) 426 56 7840

Korea:

(Tel) (82-2) 2004-5004

(Fax) (82-2) 2004-5115

Latin America:

(Tel) (305) 269 7500

(Fax) (305) 269 7599

Taiwan:

(Tel) 080-004-7866

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