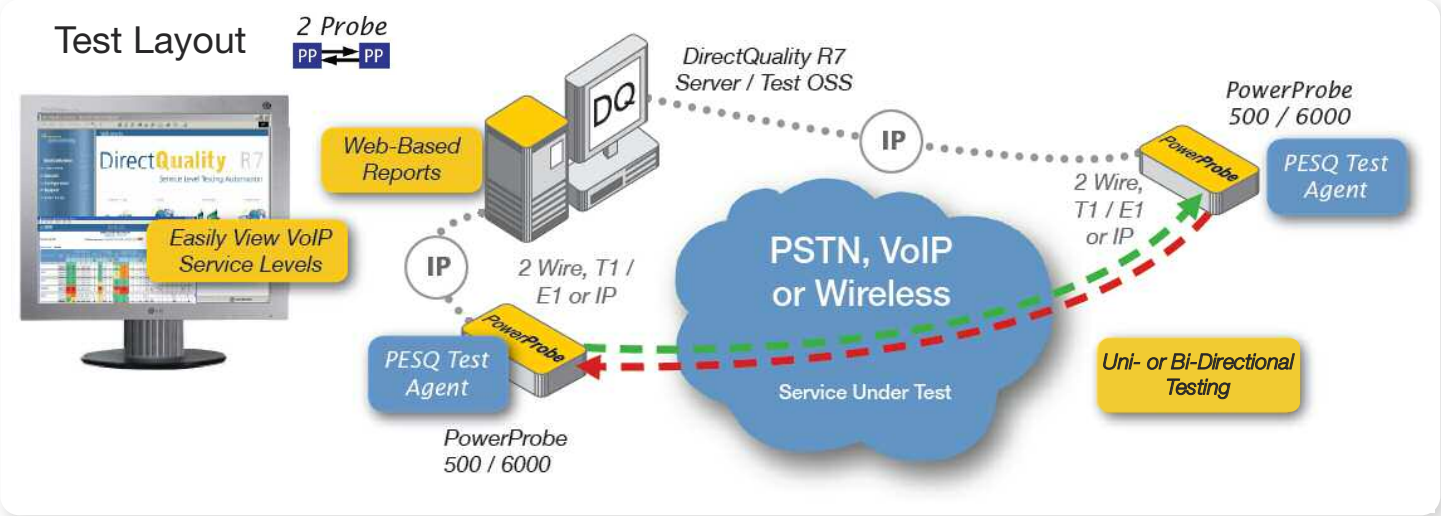
PESQ Test Agent

Active Service Assurance



Overview

Tektronix' PESQ PowerProbe® Test Agent performs objective, industry standard ITU P.862 perceptive end-to-end speech quality tests, providing LQ (listening quality) MOS to measure call quality as heard by your customers. Use PESQ testing to reliably validate and enforce SLAs, monitor the quality of voice services, provision new services, and troubleshoot quality issues over a wide variety of networks such as VoIP, PSTN, PacketCable, WiMax and cellular. In addition to listening MOS, the PESQ Test Agent also measures over 30 other speech quality metrics, including clipping events, noise, loss and speech power, as well as packet-level measurements such as packet loss, jitter and latency to fully capture impairments caused by codecs, VADs, and analog lines. Call progress analysis provides signaling and call statistics, including cause location and value for abnormally terminated calls.

Product Name:

- End-to-End Speech Quality Assessment
- SLA and QoS Monitoring
- Trouble-Ticket Resolution
- VoIP Readiness & Provisioning
- VoIP Gateway/Softswitch Acceptance
- Voice CODEC validation
- Mobile Service Quality

Key Features & Benifits

MOS Drill-Down

Unique Tektronix Active Test technology lets you drill down from any MOS rating to the technical source of the rating such as clipping, noise, and low volume.

Automated PESQ Test

Fully automated test execution and analysis. No need manage playback and recording of speech sample files at both ends.

Single-End Testing Enabled

Generate a PESQ test call from one port and receive the call on a different port on the same probe. Select a carrier or route to force the call through a particular network path.

Speech Clipping Analysis

Detect speech clipping problems caused by Voice Activity Detectors (VADs) using Front-End and Back-End Clipping (FEC, BEC) measurements. In-Between Clipping measurements let you isolate clipping caused by the network itself.

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Key Features & Benifits (cont'd)

Call Progress Analysis

Complete Call Progress Analysis is performed for each test call according to Tektronix' exclusive Enhanced E.180, providing concurrent signaling performance analysis and fault identification with each PESQ test.

E-Model Integration

PESQ MOS ratings integrate seamlessly within DirectQuality R7 award winning E-Model (G.107) application, combining both analog perceptive quality and RTP measurements such as Packet Loss, Jitter and Delay.

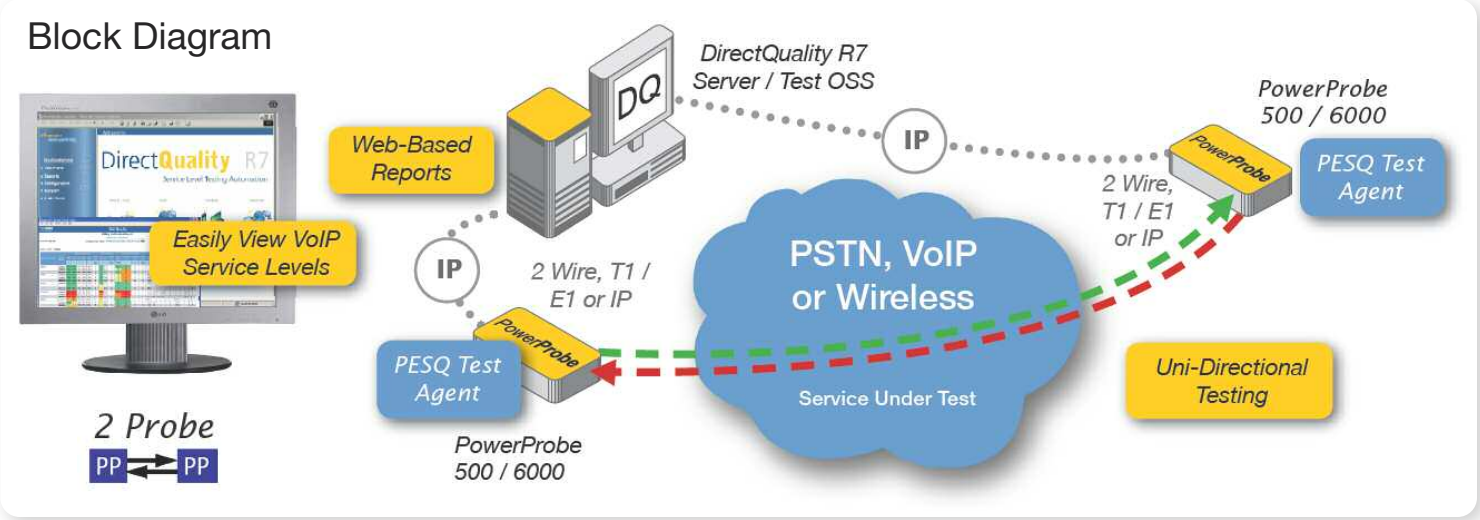
Natural Language Testing

Tektronix' NSF natural speech sample files are supplied with the test agent, providing a repeatable reference for accurate testing that ensures the full range of natural language phonetics and speech transitions are transmitted during a test call.

Rapid, Repeatable Testing

NSF speech files are highly optimized samples, providing the equivalent of one hour of natural conversation testing in less than 2 minutes.

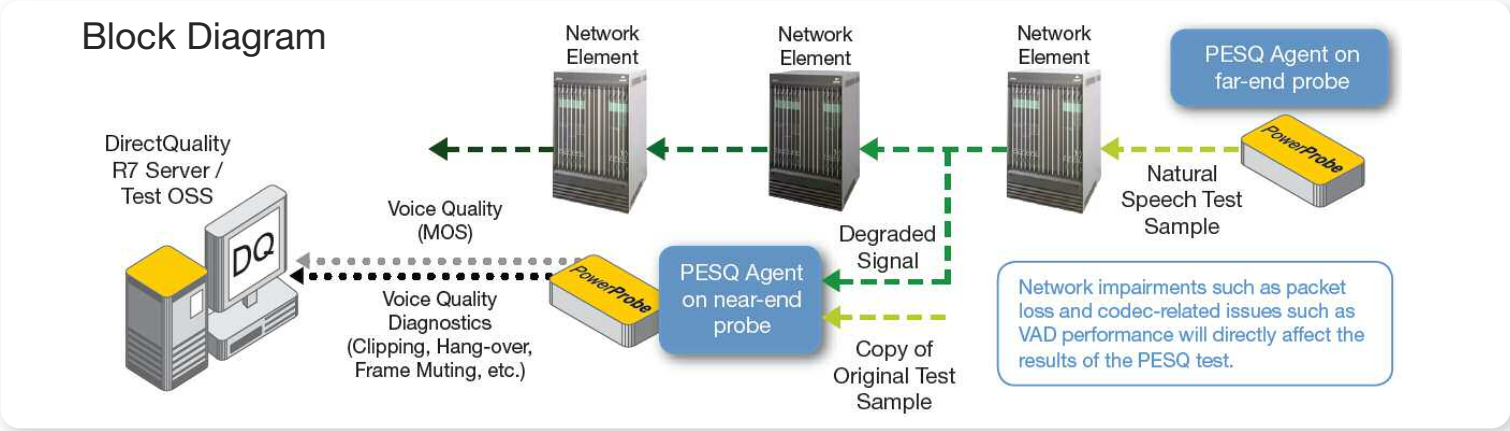
Block Diagram

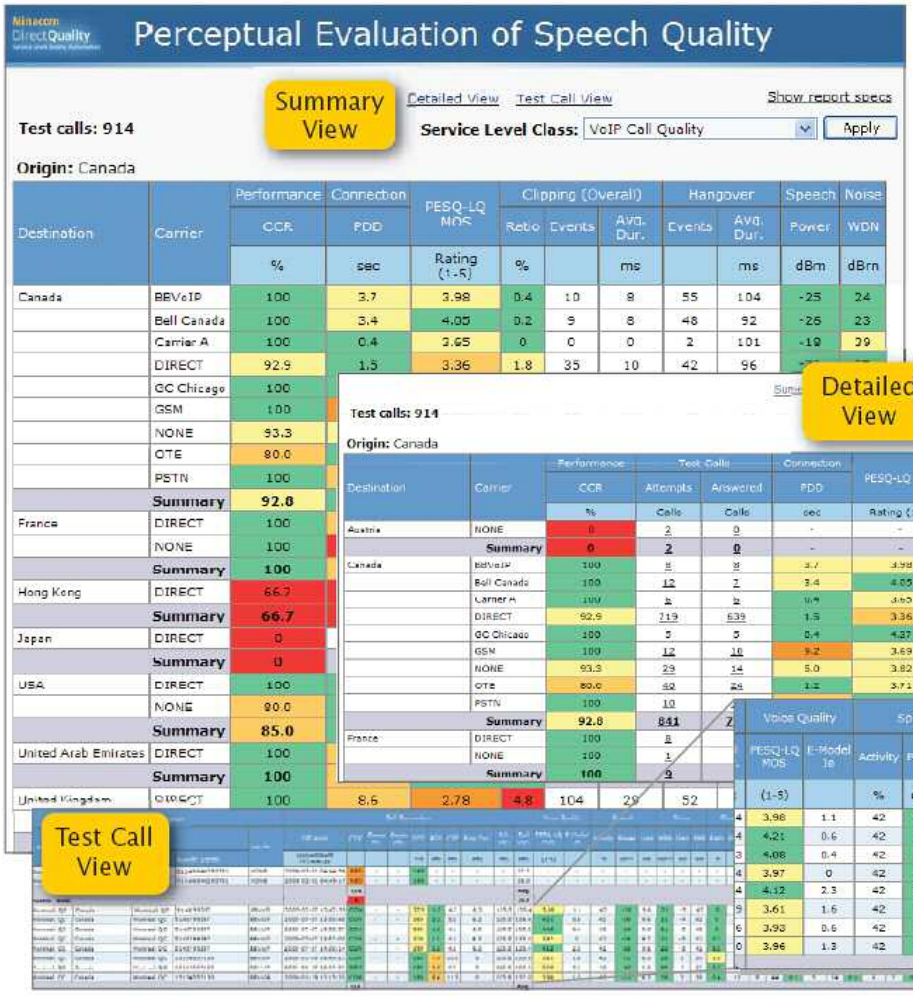


About PESQ

PESQ (Perceptual Evaluation of Speech Quality) testing is defined by the ITU standard P.862. It measures speech quality from the perspective of actual callers; the algorithm was developed and refined to correlate with subjective listening-test results conducted by the ITU, designed to quantify the quality of recorded speech from actual conversations using the Mean Opinion Score scale defined by ITU P.800.1.

PESQ measures end-to-end voice quality by comparing a reference (spoken) test speech sample with the far-end recorded (heard) version. PESQ is effective across a range of network types, including PSTN, mobile, and VoIP, as well as hybrid routes that traverse a number of networks before reaching the far-end (called) destination.





DirectQuality R7's Decision Support System brings you comprehensive reporting of your PESQ test results. The Summary View provides high-level visibility and service level classification. The Detailed view offers extensive speech and call quality metrics with drill-through functionality, and the Test Call view facilitates troubleshooting with detailed signaling information, primary measurement results and access to recorded speech sample waveforms.

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Natural Speech Test Files Included:

NSF test files are optimized, 10 second speech samples equivalent to an hour of natural speech. Based on actual recorded voice, silence and repetition are removed, leaving the 50 base phonemes and phonetic transitions intact; speech amplitude and temporal structure replicate the dynamic range and pace of actual speech.

The resulting files capture the complete range of nuances in a given language, making them ideal for repeatable, accurate perceptive PESQ speech quality tests. PESQ results using these audio files have a high degree of correlation with subjective tests originally conducted by the ITU to assess the MOS score of recorded speech samples.

With the DirectQuality R7 Web Interface you can launch off -the-shelf tools such as Adobe® Audition to perform deep speech waveform frequency and time-domain analysis on recorded PESQ samples.

Natural Speech Files (NSF)

American English

- NSF female 01
- NSF male 01
- NSF female & male 01
- NSF female 02
- NSF male 02
- NSF female & male 02
- NSF female & male 03
- NSF female & male 04

10 second files are played sequentially in Standard PESQ for a 2 minute test duration

Measurements:

Network Performance

- Call completion ratio
- Call loss ratio
- Answer seizure ratio (ASR)
- Answer bid ratio (ABR)
- Network effectiveness ratio (NER)

Call Transmission

- PESQ LQ MOS
- Speech Activity
- Speech Power
- Loss
- C-message noise
- Wideband noise

Connectivity

- Dial Tone Delay
- Ring Duration
- Post Dial Delay
- Call Setup Time
- Call Duration
- Call Disposition Codes

Clipping

- Frame Muting Ratio
- Speech Clipping Ratio
- Clipping Events
- Total Clipping Duration
- Avg. Clipping Duration
- Maximum Clipping Duration
- Proportion of Front-End Clipping
- Front-End Clipping Events
- Avg. Front-End Clipping Duration
- Proportion of In-Between clipping
- In-Between Clipping Events
- Avg. In-Between Clipping Duration
- Proportion of Back-End clipping
- Back-End Clipping Events
- Avg. Back-End Clipping Duration
- Hang-Over Events
- Avg. Hang-over Time

RTP Statistics

- Packet Loss
- Receive Duration
- Transmit Duration
- Packets Received
- Packets Sent
- Packets Lost
- Late Packets Received
- Payload Bytes Received
- Payload Bytes Sent
- Average Jitter

For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology.

Please visit www.tektronix.com

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