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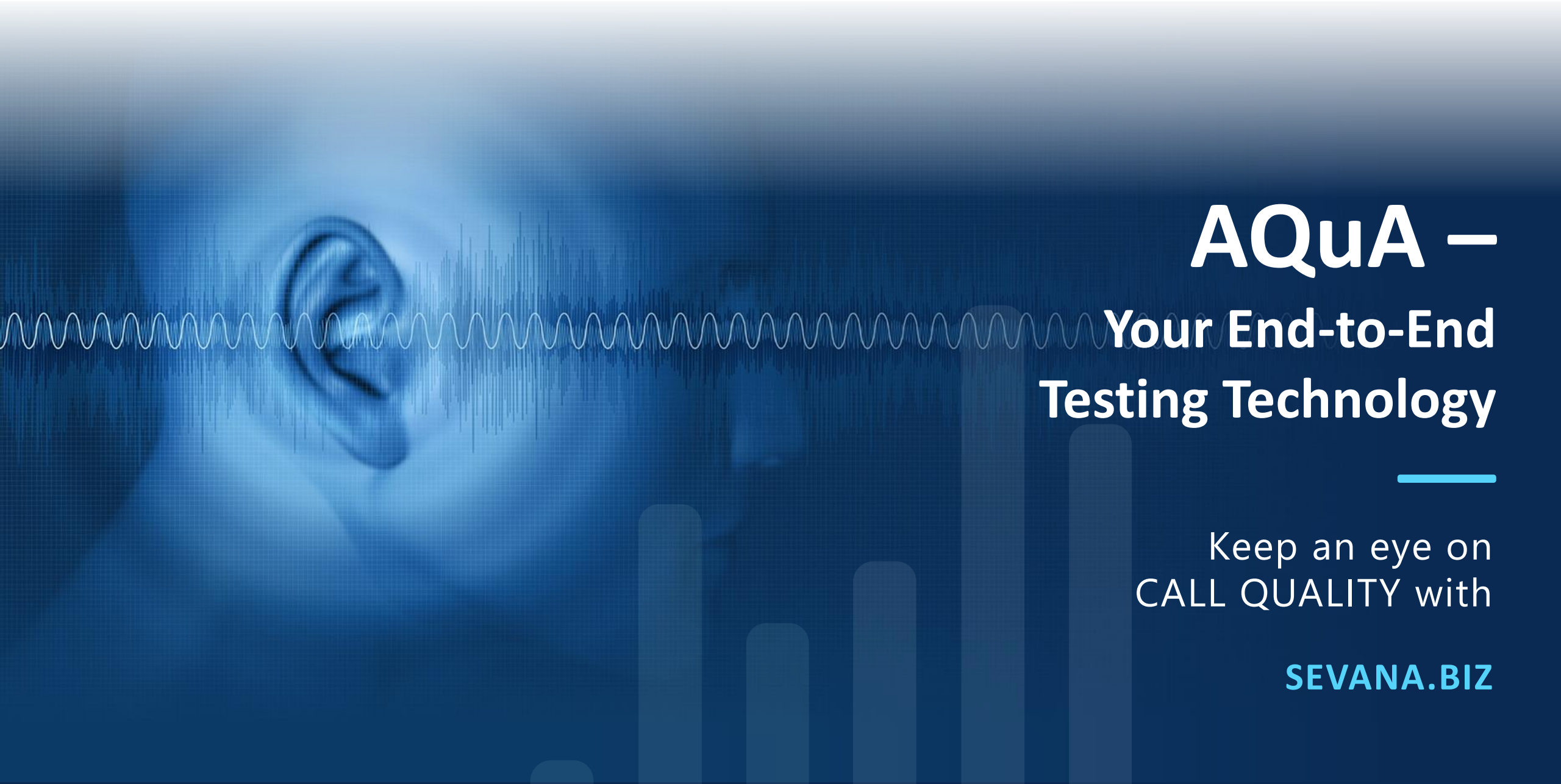

AQuA –

Your End-to-End Testing Technology

Keep an eye on
CALL QUALITY with

SEVANA.BIZ

3G UMTS End-to-End Drive Test

Drive Tester

G.729

3G UMTS

3G Voice Core
GPRS Packet Core

AQuA

PVQA

Drive Test Analysis

4G LTE End-to-End Drive Test

Drive Tester

AMR-WB

4G LTE

Evolved Packet Core

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PVQA

Drive Test Analysis

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VoWi-Fi End-to-End Drive Test

Drive Tester

G.722

WI-FI

Internet

AQuA

PVQA

Drive Test Analysis

AQuA Metrics

- MOS score according to P.800 – reliable objective MOS scores from 1 to 5
- Percentage of sound quality similarity between reference and test audio
- Duration distortion
- Delay or advancing of audio signal activity
- Sound signal activity mistiming
- Signal spectrum damages
- Signal spectrum vibration
- Unidirectional signal spectrum analysis: amplification or attenuation
- Most affected signal spectrum: low, medium, high bands
- Average pitch
- Pitch deviation
- Pitch frequencies distribution distortion
- Quantization steps distribution distortion
- Amplitude clipping level
- RMS
- Sound signal: Minimum Energy, Maximum Energy, Average Energy
- Sound signal: Min. Sample, Max. Sample, Average Sample

PESQ. POLQA. AQuA. Feature Comparison Table

Feature	PESQ	POLQA	AQuA
Measurements in wideband audio	NO	YES	YES
Accurate measurements in CDMA networks	NO	YES	YES
VAD detection in AMR codec	NO	YES	YES
GSM/WCDMA accurate measurements	NO	YES	YES
Variable delay up to 1 sec in VoIP	NO	YES	YES

PESQ. POLQA. AQuA. Feature Comparison Table

Feature	PESQ	POLQA	AQuA
Strong linear distortions	NO	YES	YES
Limitations with speech enhancement devices (noise reduction, gain control)	YES	NO	NO
Works in NB (up to 8 kHz Sample Rate) bandwidths	NO	YES	YES
Works in WB (up to 16 kHz Sample Rate) bandwidths	NO/YES	YES	YES
Variable delay up to 1 sec in VoIP	NO	YES	YES

PESQ. POLQA. AQuA. Feature Comparison Table

Feature	PESQ	POLQA	AQuA
Works with audio sampling rate higher than 48kHz	NO	NO	YES
Works with all standard and non-standard codecs audio (AMR-WB, EVRC-WB, iLBC, AMB+, AAC, SLIK, G.711, G.729)	NO	YES	YES
Works with all technologies (GSM, WCDMA, LTE, VoIP, VoIP over IMS)	NO	YES	YES
Can be used in testing terminals and hand-free applications	YES	YES	YES
Considers codec degradations (tandem codecs, packet loss, frame errors, bit errors)	NO	YES	YES

PESQ. POLQA. AQuA. Feature Comparison Table

Feature	PESQ	POLQA	AQuA
Customizable perceptual model and algorithm	NO	NO	YES
Considers network specific degradations	NO	YES	YES
Copes with P.800 MOS	NO	YES	YES
Talking quality	YES	NO	NO/YES
MOS score for long sequences of speech (longer than 30 seconds)	**NO**	**NO**	**YES**

PESQ. POLQA. AQuA. Feature Comparison Table

Feature	PESQ	POLQA	AQuA
Noisy listening environments	NO	NO	YES
Music clips	NO	NO	YES
Noise suppressors	NO	NO	YES
Non-telephony applications	YES	NO	YES
Language independent	**YES**	**NO**	**YES**

PESQ. POLQA. AQuA. Feature Comparison Table

Feature	PESQ	POLQA	AQuA
Multi-dimensional audio (Works with Stereo)	NO	NO	YES
Unified perceptual model for all types of audio (speech, music)	NO	NO	YES
Ability to work with audio starting from 2 sec duration	**NO**	**NO**	**YES**

AQuA has some key features vital for sound quality evaluation during deployment and operation of VoLTE, VoWi-Fi, RCS:

- Language independent
- Long test calls support
- Short test calls support
- Ability to work with Stereo sound

PVQA Metrics

MOS score according to P.800 – reliable objective MOS scores from 1 to 5
Impairments detection (reasons for QoE drop down):

- Noise
- DeadAir
- Amplitude clipping
- VAD Clipping
- Clicking
- Crackling
- Fuzzy voice
- Echo
- DTMF

By just waveform analysis PVQA is able to discover such network issues as f.e.

- Packet loss (DeadAir + Crackling)
- Hardware issues (Amplitude clipping, VAD clipping)

Relying on Sevana technologies for sound quality analysis you

- Improve your systems QoE and invest in the future – waveform analysis works seamlessly for VoLTE, VoWiFi, RCS, or any future approach.
- Free to work on the hardware of your choice.
- Develop your own call quality monitoring solutions implemented by your own staff.
- Automate call quality assessment and ease problem root cause identification.

SEVANA

THANK YOU!

Keep an eye on
CALL QUALITY with

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