

Voice Services

The basic elements for telecommunication!

Voice

Do not ignore your core services!

Voice services are fundamental to telecommunications companies. It is vital that the user experience of these services is measured continuously by active testing. Only this can assure the quality of this core service.

Verification of various KPIs are performed on basic voice parameters, such as checking B-channel availability, measuring call establish duration and call success rate alerts, to name a few.



- Voice
- Push-to-Talk
- Interactive Voice Response
- Suppl. Services

Sample KPIs

- Call Duration
- Received CLI
- Establish Duration
- Alert Duration



Sample KPIs

- Stop-Talking Timer Failure Ratio
- Stop-Talking Time
- Session Cut-off Ratio
- Session Setup Time
- Voice Delay (in session)
- Voice Delay (first)

Sample Features

- CLI Check
- Call establishment to external party
- Call establishment between two parties
- Call establishment without answer on external side (no connective costs)
- B-Channel check
- Check of all available PLMNs

Push-to-Talk

Back to the Future with Push-to-Talk!

The “push-to-talk” services turn mobile phones into walkie-talkies with unlimited range.

The benefit of radio-style communication, especially broadcasting to multiple users, makes it much more convenient than making many phone calls or even call conferencing.

Sample Features

- Test 1-to-1 or 1-to-many communication
- Play and record speech data
- Emulating PTT mobiles
- Real End-to-End Testing of real-time-always-on voice service
- Check SIP (Session Initiated Protocol) Control Plane
- Check RTP (Real-time Transfer Protocol) User Plane



Interactive Voice Response (IVR)

Do your voice response services work correctly?

IVR services are deployed during Voice-mail access and are a common feature of everyday life such as phone banking, ticketing and customer hotline services.

Testing these systems is essential for network operators (and their customers) to assure the quality of their services. IVR systems are sophisticated and extremely

difficult to test on an active and reliable basis.

Keynote SIGOS innovation has created a tool that can wholly automate this task. The IVR tester is designed so that even the most sophisticated speech menus may be recorded and recognized based on a library of voice prompts.

Sample Features

- Testing IVR trees
- Voice mailbox tests
- Resource allocation for different users or groups
- Announcement comparison based on new voice prompts
- Easy integration of new voice prompts
- DTMF and voice stimulation
- Customer specific extension
- Several languages available

Sample KPIs

- Call Duration
- Duration of played audio file
- Length of recognized reference prompt
- Duration of recognition process
- Recognition confidence of best recognized
- Reference prompt
- Recorded audio file location
- Real duration of recording



- Voice
- Push-to-Talk
- Interactive Voice Response
- Suppl. Services

Supplementary Services

Compliments on your supplementary services?

Supplementary services like call forwarding, call waiting, call barring, call hold, CLIP/CLIR are multi-switched services which require complex interaction within the network and its elements.

Other supplementary services, like pre-paid customers checking their current account balance, involves the GSM protocol USSD (Unstructured Supplementary Service Data). At the same time, seamless and instant operation of all supplementary

services, including notifications and coding of all relevant information are vital for a satisfying end-user experience.

Keynote SIGOS Test Systems provide you with a comprehensive range of test cases for all relevant KPIs and the ability to test USSD protocol commands as well as operator specific extensions, so that your customers will pay you compliments on your supplementary services!

Sample Features

- Supplementary Service tests e.g.
 - 'Call Forwarding'
 - 'Call Hold'
 - 'Call Barring'
 - 'CLIP'/'CLIR'
 - 'Call Waiting'
 - 'Multi Party Call'
- DTMF and voice stimulation testing
- USSD testing

Sample KPIs

- Forward Erase Duration
- Forward Register Duration
- Received CLI
- Barring Activation Duration
- Call Hold Duration
- USSD Received Response



Voice Advanced

Do you offer excellent Voice Quality?

Voice Quality

Do you offer excellent Voice Quality?

Voice Quality is, and will remain, the major key performance indicator for each operator's network quality. This is recognized by subscribers and operators alike.

Bad voice quality represents noise, echo, degraded tele-conversations and immediately sets a poor level of user satisfaction.

International Carrier Voice Quality tests can reveal crucial quality information of different network carriers and if it has been impacted by the usage of IP routing or SIM boxes. Therefore, verification of voice quality is essential.

Automated test methods with the intention to mimic subjective tests, allow for a cost effective and consistent alternative to subjective testing, either on a referenced or an unreferenced algorithm.

Referenced Voice Quality Testing (PESQ and POLQA)

Referenced Voice Quality testing is based on the ITU-T P.862 standard via the PESQ algorithm (Perceptual Evaluation of Speech Quality) and the ITU-T P.863 standard via the POLQA algorithm (Perceptual Objective Listening Quality Analysis).

Both form the state-of-the-art techniques and international standards for automated advanced perceptual voice quality analysis, comparing actual test results with audio references. Referenced voice Quality Testing provides a very high level of accuracy.

Sample KPIs

- POLQA MOS value (P.863)
- PESQ MOS-LQO value (P.862.1)
- Background noise
- Average delay
- Attenuation
- Signal to noise ratio

Sample Features

- Reference speech quality assessment model
- Accurate full-reference model
- Customer specific audio reference files are easy to integrate
- Objective Mean Opinion Score / Perceptual Evaluation of Speech Quality (MOS-LQO / PESQ)
- MOS Voice Quality result values from 1-5
- Support of super-wide-band signals up to 14kHz

Echo Testing

In the course of the migration of 2G/3G Core Network (CN) and Radio Access Network (RAN) towards IP based transport solutions the importance of Echo measurements raises considerably.

In SITE, the echo itself is generated artificially and its characteristics can be configured by the user. This allows for the simulation of well defined (acoustic) echoes that enables users to check whether the echo cancellers are configured correctly.

Sample KPIs

- Echo Return Loss (ERL) in dB
- Echo Delay in ms
- Echo Classification (acceptable, unacceptable, side tone)



Voice Quality

- Referenced VQ (PESQ/POLQA)
- Unreferenced VQ (3 SQM)
- Echo Testing
- Voice over IP Quality Testing



Unreferenced Voice Quality Testing (3SQM™)

Keynote SIGOS Test Systems also support the Single Sided Speech Quality Measure 3SQM™ (ITU-T P.563) for advanced non-intrusive voice quality testing. The technology behind 3SQM™ is based on a generic perceptual approach and so is independent from any original reference signal.

In comparison to intrusive measurement techniques, such as PESQ, 3SQM™ is based on single ended measurements. In consequence, accuracy may not be as high but measurements can be worked on an analysis of the digital bit stream on an IP packet level. The measurement is limited to the transport stream analysis.

Sample Features

- Perceptual analysis of degradations in voice signals
- Non-intrusive, single ended analysis method
- Output score correlates well with subjective MOS
- Available as DLL/Library or Source

Sample KPIs

- 3SQM MOS value
- Noise level
- Background noise
- Beeps
- Signal to noise ratio

Voice over IP Quality Testing

Voice Quality is vitally important for any type of network that routes voice traffic. With the shift from dedicated circuits to the efficiency of IP based traffic, it brings its inherent issues with regard to the end customer's satisfaction with quality performance.

Additional PESQ KPIs such as Real-time Transport Protocol (RTP), Jitter and Packet Loss are actively monitored.

Performing checks on a comprehensive set of voice quality metrics ensures that IP networks run smoothly and problems are detected before they cause major disturbances leading to customer dissatisfaction.



Voice Quality

- Referenced VQ (PESQ/POLQA)
- Unreferenced VQ (3 SQM)
- Echo Testing
- Voice over IP Quality Testing

Additional KPIs

- RTP Jitter
- RTP Packet Loss