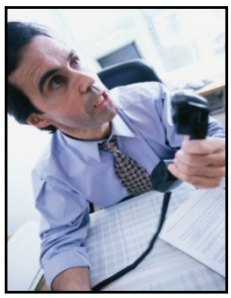
Measuring VoIP Service Quality

Malden Electronics

MultiDSLA predicts end-to-end user experience



"Measure performance in the language he understands"

Users do not generally recognise "packet loss" and "jitter"; they experience "too quiet", "distorted", "noisy", "broken up", etc.

Enterprises and Network Operators use MultiDSLA Systems to measure and confirm the Key Performance Indicators of speech quality on their networks.

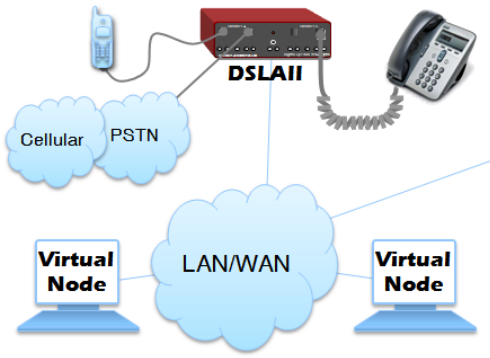
What is important?

- Benchmark service provision with ease and confidence
- Rapidly understand and resolve QoS issues - respond to dissatisfied users with objective data

Assessing VoIP Performance

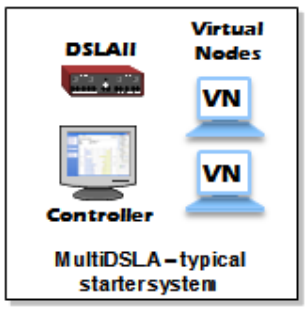
- Visualise performance through powerful graphics
- Test speech quality thoroughly and repeatably with standards-based metrics
- Verify VoIP Key Performance Indicators (KPI) against Service Level thresholds
- Make measurements at the user's telephone

MultiDSLA works across the Enterprise with all types of telephone terminals and calls



Using MultiDSLA in the Enterprise Network

- Just attach the handset cord of the user's telephone to the DSLAII to measure performance
- Employ Virtual Node (VN) as a reference VoIP device to make calls to physical IP phones, soft phones, other VN's, etc.
- Test between pairs of VN's to benchmark network capability independent of the performance of the IP terminals and other gateway devices; assess the "VoIP readiness" of a network, and understand the trade-off between bandwidth economy and speech quality for different codecs
- Test all calls, both on-net and off-net, including calls to cellular and PSTN destinations
- Test conference calls (VoIP, analogue or mixed access), IVR response and voicemail access/retrieval
- Use MultiDSLA stand-alone or integrate with NMS and scripted automation host



MultiDSLA – a Scalable Test System

- A typical starter system for VoIP assessment consists of:
  - MultiDSLA Controller GUI for Windows, with options bundle
  - DSLAII - two channel instrument for users' telephones and/or PSTN/PBX lines
  - Two VoIP Virtual Nodes – reference VoIP entities with SIP, H.323 and multiple codec support

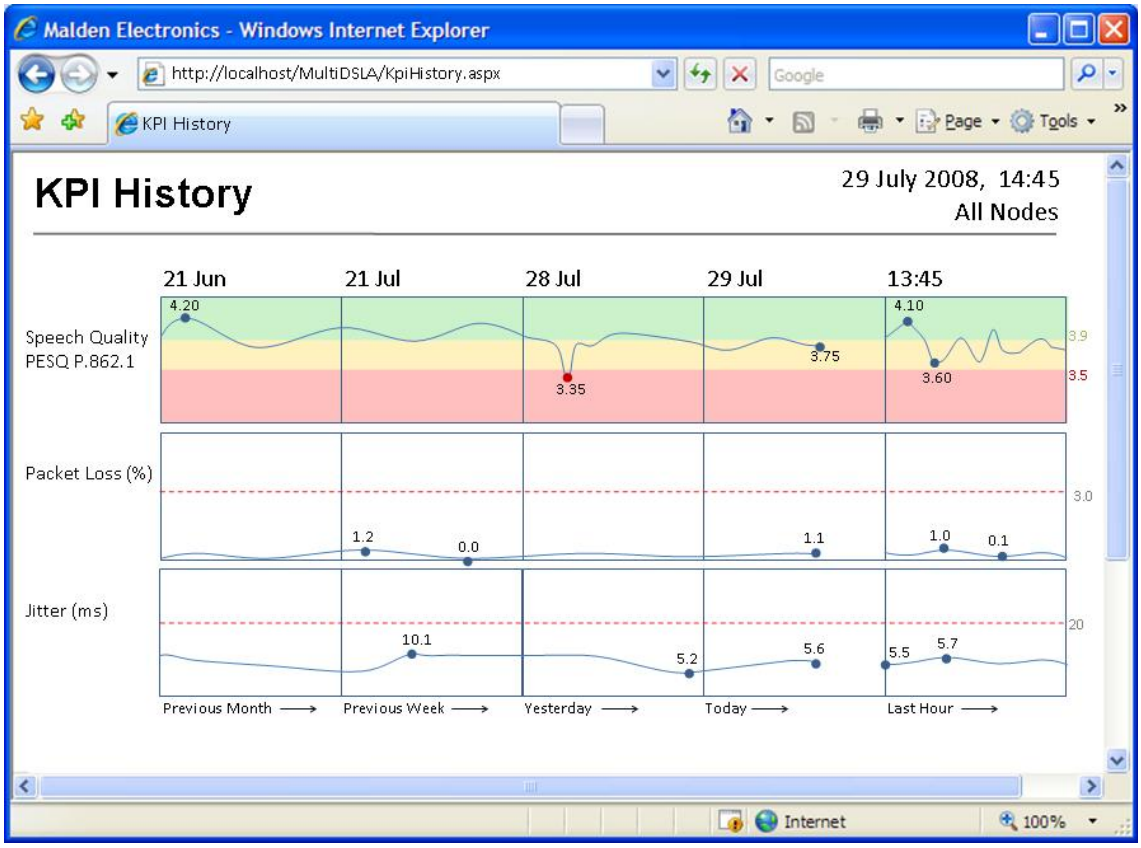
Results Analysis and Reporting

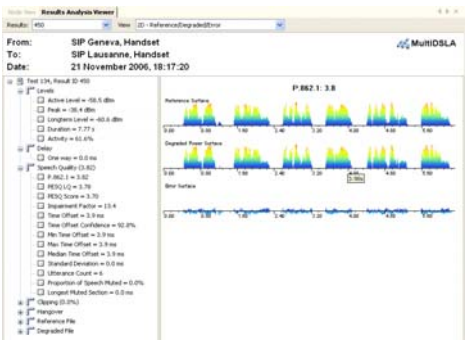
MEASUREMENTS

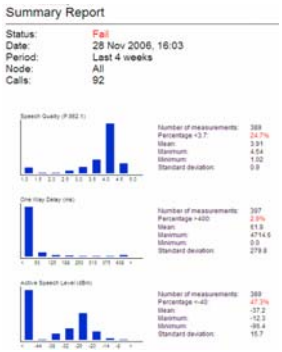
Key **P**erformance **I**ndicators can include:

- Speech quality score (ITU-T Rec. P.862 PESQ, narrow- and wide-band models)
- Received speech level (ITU-T Rec. P.56)
- Received noise level
- Echo level
- Delay and delay variation
- Post-dial delay
- Jitter, RTP & RTCP
- Packet loss, RTP & RTCP
- DTMF performance
- Call success rate

Service Level Agreements can contain any of these KPIs. MultiDSLA measures them all.







- Display results as simple statistical analysis or detailed analytical data.

Non-Speech KPI's

- Analyse every aspect of VoIP performance. In addition to speech quality...
  - See initial response and call setup times
  - Decode and understand SIP signalling messages in simple diagrams
  - Check packet statistics – loss, jitter, mis-sequenced, etc.
  - Verify end to end DTMF transmission for in-band and out-of-band (RFC2833)

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