

Keynote Voice Perspective

Voice Monitoring Solution for Business

Proactively measure and manage voice performance with Keynote Voice Perspective a Web-based automated service that measures the quality and reliability of Internet telephony from the end-user perspective.

With the adoption of VoIP it becomes extremely important to monitor performance related issues and their effect on end-users. Interaction with contact centers or distributed sales / service forces are an extension of your brand image.

packet switched networks, Public Switched Telephone Networks (PSTN) and cellular networks. Hybrid networks have a higher potential to introduce voice impairments. Voice Perspective is the only service which measures both VoIP and PSTN lines. Measuring and monitoring end-user experience helps you:

- take pro-active measures when call quality suffers
- ensure your vendors meet the SLA agree upon
- create service differentiation

How it Works

Voice Perspective is a hosted service that is managed and maintained by Keynote. The Responder is placed in your environment, and is connected to our Public Caller Agents. Calls are automatically placed every 30 minutes for each caller location. For each call placed, we collect detailed metrics during the call establishment phase as well as during transmission of audio payload. Additionally, we conduct audio fidelity analysis to identify issues such as hum, hiss, static or clipping that affect the user experience. You can use the MyKeynote portal to analyze and identify contributors to underlying issues.

Key Features

- Outside-in approach to your network
- ONLY hybrid infrastructure measuring VoIP *and* PSTN
- One call every 30 minutes for each location and service pair (caller location)
- Geographically distributed monitoring network
- Last-mile data capture with adapters and ISP access
- Easy data access and visualization via Web portal
- Data visualization and customizable drill down
- Customizable rule based email alerts

Voice Perspective addresses Contact Center needs:

Keynote Systems, Inc. has extended its Voice Perspective product to address voice quality monitoring needs for contact centers. We offer a geographically distributed view of the voice service experience when dialing into a contact center, providing a tool to measure true end-user experience.

Measuring Performance: Your MOS Score

The Mean Opinion Score (MOS) quantifies the quality of a voice call. MOS scores are particularly important when measuring the degradation of a call when compression is used for bandwidth conservation.

Why measure end-user experience?

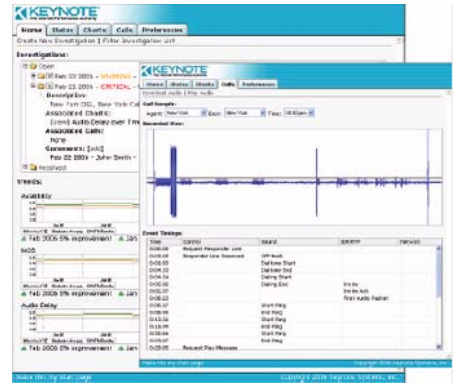
With the growth of Internet and mobile telephony, calls traverse over hybrid networks including

Key Performance Indicators that Keynote Measures:

- **Service Availability:** the percentage of all test calls that had a dial tone when the line was taken off hook.
- **Call Completion:** Call Completion is the percentage of all calls that were connected through to the correct destination line after dialing
- **Average Answer Time:** Average Answer Time is the number of seconds it takes to connect a call after dialing commences.
- **Dropped Audio:** The percentage of calls where the audio playback is terminated at an unexpected time during the call.
- **Average Audio Delay:** The number of milliseconds it takes for audio to travel from one end of the line to the other.
- **Audio Delay Acceptability:** The percentage of calls that meets the minimum tolerable threshold for audio delay.
- **Audio Delay Variability:** The normalized standard deviation of audio delay measurements provides an indication of consistency or variability from call to call.
- **Mean Opinion Score:** Generated with the ITU P.862 PESQ algorithm, a measurement of the degradation in audio quality over the call.
- **MOS Acceptability:** The percentage of calls that meets the minimum tolerable threshold for mean opinion score.
- **MOS Variability:** The normalized standard deviation of mean opinion scores provides an indication of consistency or variability from call to call.

Easy Data Access, Visualization, and Reporting

Using Keynote's Web-based portal to access your data makes analysis easy and fast. You can set up standard scheduled reports or customize your reports and save them in several formats, including HTML, PDF, and CSV, for specific management reporting needs.



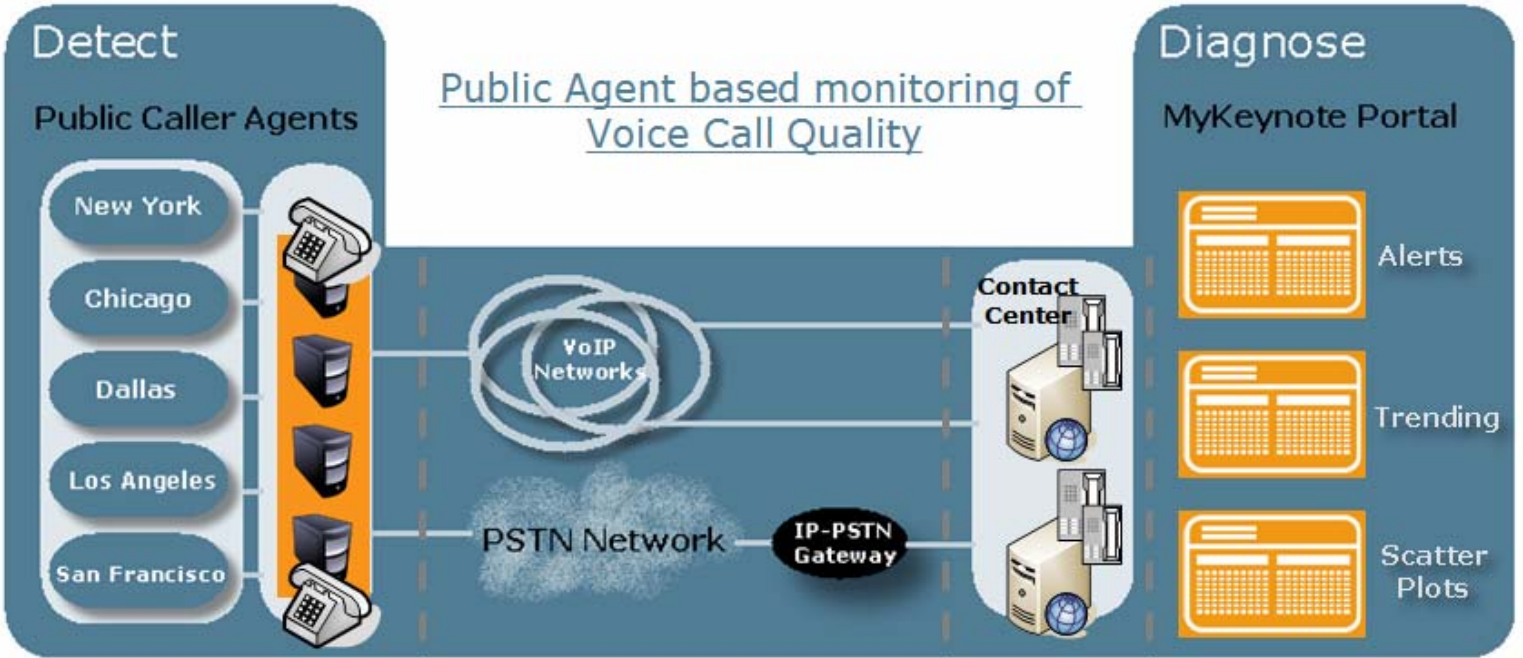
Real-Time Monitoring and Alerting

Voice Perspective enables you to conduct critical, proactive, problem diagnosis. With real-time alerts sent to you or a group of users you can access data anywhere, anytime. The system provides automatic base-lining of alarm thresholds based on day of the week and hour of the day. Service Level reporting may be configured for hourly, daily, weekly or monthly views.

SLA Management

Most broadband networks are less than 10 years old. The Voice over IP technology is rapidly improving; however packets are still lost or delayed, creating a momentary drop-out of voice. Quality metrics will aid your relationship with your service provider.

- Geographically isolate problem areas
- Proactive performance measurements
- Monitor service level compliance
- Understand user experience



Keynote Public Caller Agents are located in metropolitan service areas around the US. Choose the cities that most represent your user community.

For each location selected, choose a service to monitor. Telephone networks may be monitored for comparisons.

A Keynote Responder in your location measures the quality of your voice service.

Know what your end users experience is and take proactive action if the quality is less than it should be.

Distributed Measurement Infrastructure

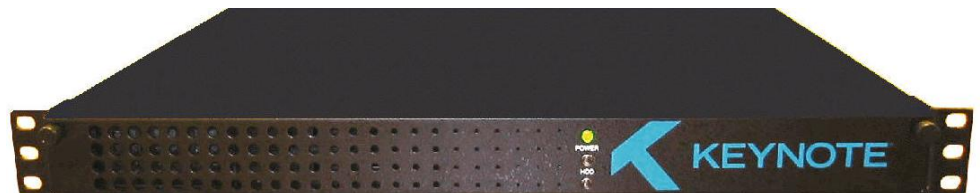
At the heart of Voice Perspective is a network of measurement agents distributed in 5 major metropolitan locations. You can select individual agents or agent groups, or assign custom agent groups to measure the voice quality in specific locations, where your users reside.

Voice Perspective Options to Meet Your Specific Needs

Multi – City Caller Agents lets you select the most representative locations for your client base. Elect to have calls measured from all agents, or only a couple.

Multiple Network Choices for those contact centers using more than one service provider. PSTN monitoring is available for benchmarking and comparison.

Keynote Responder is a 1 U device that is installed on your premise with complete control over deployment, access to data, and security for sensitive voice content.



Data Views from MyKeynote

KEYNOTE MyKeynote The Mobile & Internet Performance Authority. Welcome, one of QA Demo Zone [Log out] Time: 08/03/2007 14:54 (PDT) [Help]

Start Measure Alarm Diagnose Reports Admin

Summary Configure Format Maintenance Alarm Log Baseline

ALARM: SUMMARY

Call Path	Audio Quality (Audio Delay MOS)						Service Availability			Last Alarm	
	Warning		Critical		Actual		Warning	Critical	Actual		
	Audio Delay	MOS	Audio Delay	MOS	Audio Delay	MOS					
Caller1PSTNtoResponder2Earthlink-DEFAULT	3000.0 msec	3.1	4000.0 msec	2.5	116.750 msec	4.0	99.00%	98.00%	100.00%		
Caller2PSTNto Responder1ATT-DEFAULT	3000.0 msec	3.1	4000.0 msec	2.5	*	*	99.00%	98.00%	100.00%		
Caller2VonagetoResponder1PSTN-DEFAULT	3000.0 msec	3.1	4000.0 msec	2.5	121.500 msec	4.2	99.00%	98.00%	100.00%		
VoIP PSTN to ATT script 001-Check Alert for maintenance - reg test		*	4.6		*	4.5		99.00%	98.00%	100.00%	2007-07-25 14:22:33.0
VoIP PSTN to ATT script 001-DEFAULT	3000.0 msec	3.1	4000.0 msec	2.5	115.000 msec	3.5	90.00%	80.00%	100.00%		
VoIP PSTN to ATT script 001-Maintenance voip - recheck		*	4.8		*	4.7		99.00%	98.00%	100.00%	2007-07-26 12:28:18.0
VoIP PSTN to ATT script 001-Maintenance voip PST - recheck		*	3.1		*	2.5		99.00%	98.00%	100.00%	2007-07-26 04:09:48.0
VoIP PSTN to ATT script 001-pst chk for maintenance		*	3.1		*	2.5		99.00%	98.00%	100.00%	
VonageToATTAudioDirCallerToResponder-DEFAULT	3000.0 msec	3.1	4000.0 msec	2.5	*	*	99.00%	98.00%	100.00%		

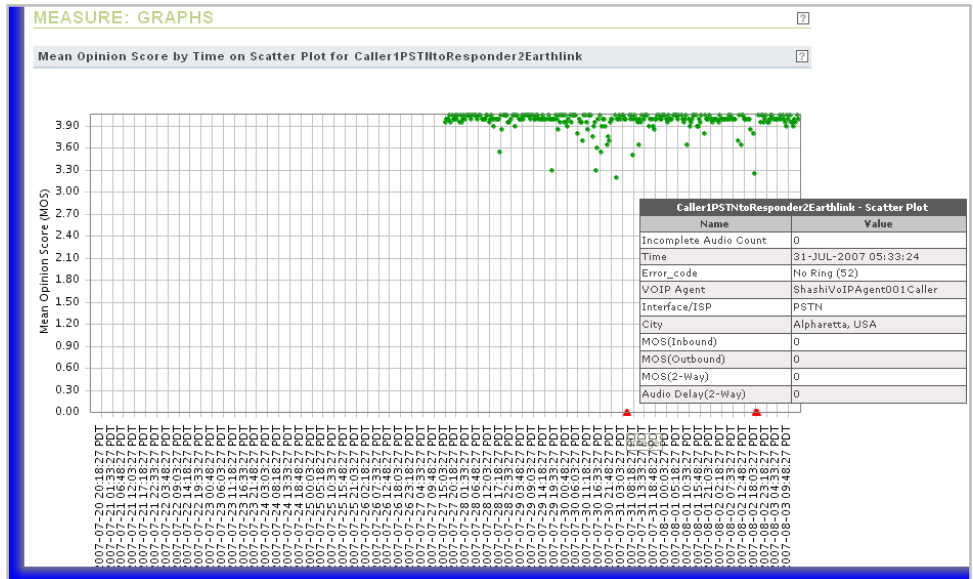
* = Disabled

Copyright © 2007 Keynote Systems, Inc. All rights reserved. | Feedback | Terms of Service | Privacy Policy | Support

Alarm Page Showing the Audio Delay and MOS variations and the Service Availability.

About Keynote

Keynote Systems (NASDAQ "KEYN") is the global test and measurement company for mobile communications and online business performance. As an independent and trusted third-party, Keynote provides IT and marketing executives with an unbiased view into their online business from around the world. For over a decade, we have been providing measurement data and testing capabilities that allow companies to understand and improve their customer's online and mobile experience.



Scatter plot of the MOS score showing the distribution of measurements allowing users to spot outliers immediately.