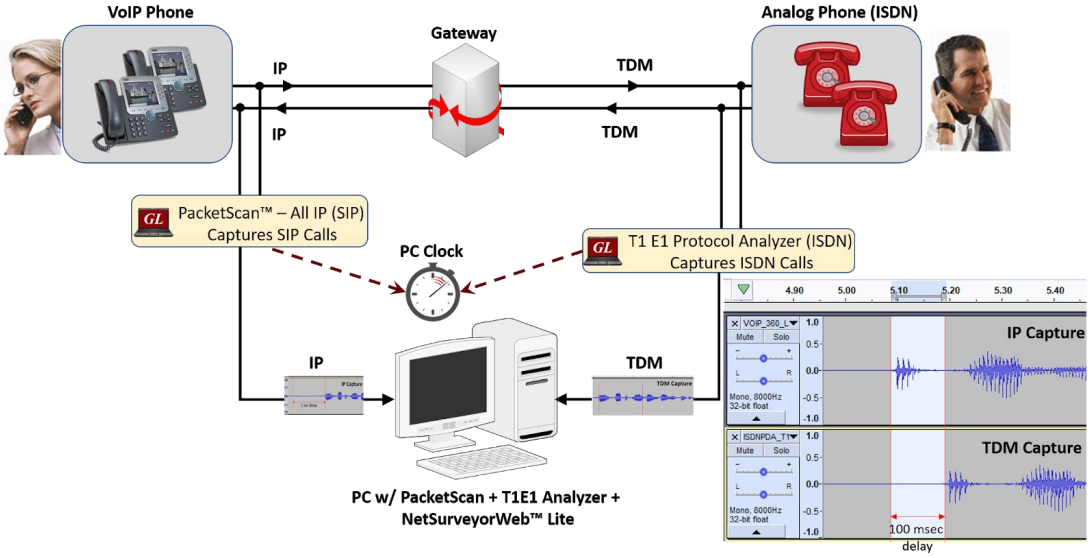
Gateway/Router Performance Measurements



Overview

Signaling and voice that traverse through various network elements including gateways, routers, and switches may suffer impairments in voice delay, voice quality, signaling delay, and congestion. Performance measurement tools can help quantify the degradation whether occurring in individual elements or in the end to end path.

The traffic which traverses through Router/Gateway can be captured at both TDM and IP interfaces simultaneously (synchronized to a common clock) and stored in a common codec format e.g. *.pcm. These captured voice segments can be further processed using GL's Delay and Voice analysis applications:

Delay measurement module compares the samples based on the timestamp and provides the delay metrics such as One Way Delay (OWD), Round Trip Delay (RTD), Post Dial Delay (PDD), Signal-to-Noise Ratio (SNR).

Voice Quality Analyzer (VQT) also supports analysis of these captured files using POLQA/PESQ algorithm providing MOS, E-Model, Signal Level, Noise Level, and Jitter metrics.

Real-time Voice-band Analyzer (VBA) analyzes captured voice band traffic providing Active Speech Level, Activity Factor, RMS Factor, DC Level, Noise Level, Echo Return Loss, Echo Delay, and Echo Dispersion statistics

GL's **NetSurveyorWeb™ Lite** works with GL's TDM/IP Protocol Analyzers, Voice Band Analyzer and Delay Measurement tools to analyze captured voice traffic and provide precise voice and one-way delay metrics.

For more information, please visit Gateway/Router Performance Metrics webpage.

Main Features

- Reports important protocol signaling information.
- Remote monitoring capability using GL's Network Surveillance System.
- Provides various Signaling Key Performance Indicators (KPI's) such as Call Success Ratio, Failure Calls, Call Failure Cause, Setup Duration, and Billing Duration (TDM).
- Provides Voice Quality KPIs based on Voice Quality (MOS, R-Factor), Delay Measurements (RTD, OWD), and speech Metrics.
- Provide accurate One-way delay measurements.
- Speech Metrics (Active Speech Level, Activity Factor, Noise Level, DC, RMS)
- Capture SS7 calls on multiple T1 E1 trunks using a signaling link on a different physical trunk than the telephony circuits.
- Drill-down to calls of interest with filter and/or search options
- Customize Filters (Date, Time, and other call control parameters.
- Apply single or multiple filters for data analysis; use logical operators between filters

GL Communications Inc.

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A

(Web) www.gl.com - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) info@gl.com

How Router/Gateway Delay is Calculated

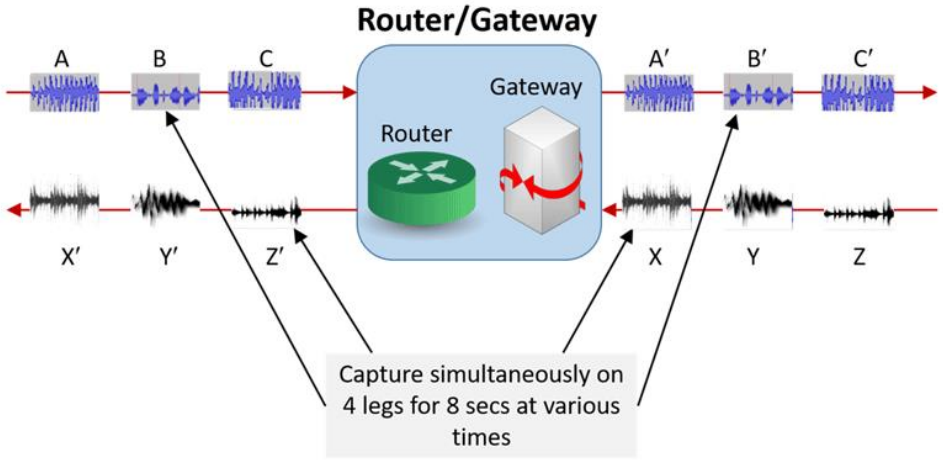


Figure: Router/Gateway Delay Calculation

Delay Confirmation

Confirm the delay using **Audacity** application as shown below.

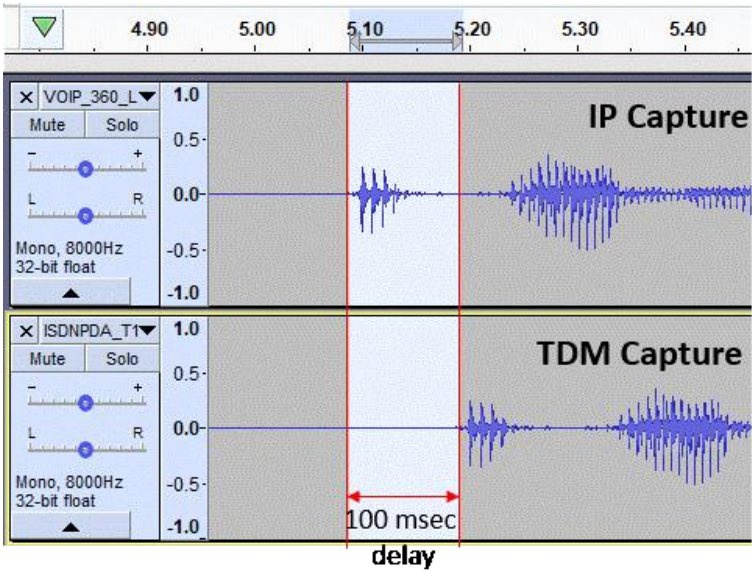


Figure: Delay Confirmation using Audacity

ISDN/SS7 Protocol Analyzer

The analyzer displays Summary, Detail, and Hex Dump Views in different panes. The ISDN Summary View displays Device Number, Frame Number, Time, Length, C/R, SAPI, TEI,P/F, N(S),N(R), Func, CRV, Called and Calling No and so on. The SS7 Summary View displays Frame Number, Time, Length, BSN, BIB, FSN, FIB, SCCP message type, called / calling number, and so on. User can select a frame in Summary View to analyze and decode each frame in the Detail View. The Hex dump View displays the frame information in HEX and ASCII octet dump formats. The contents of detail and hex dump view can also be copied to clipboard.

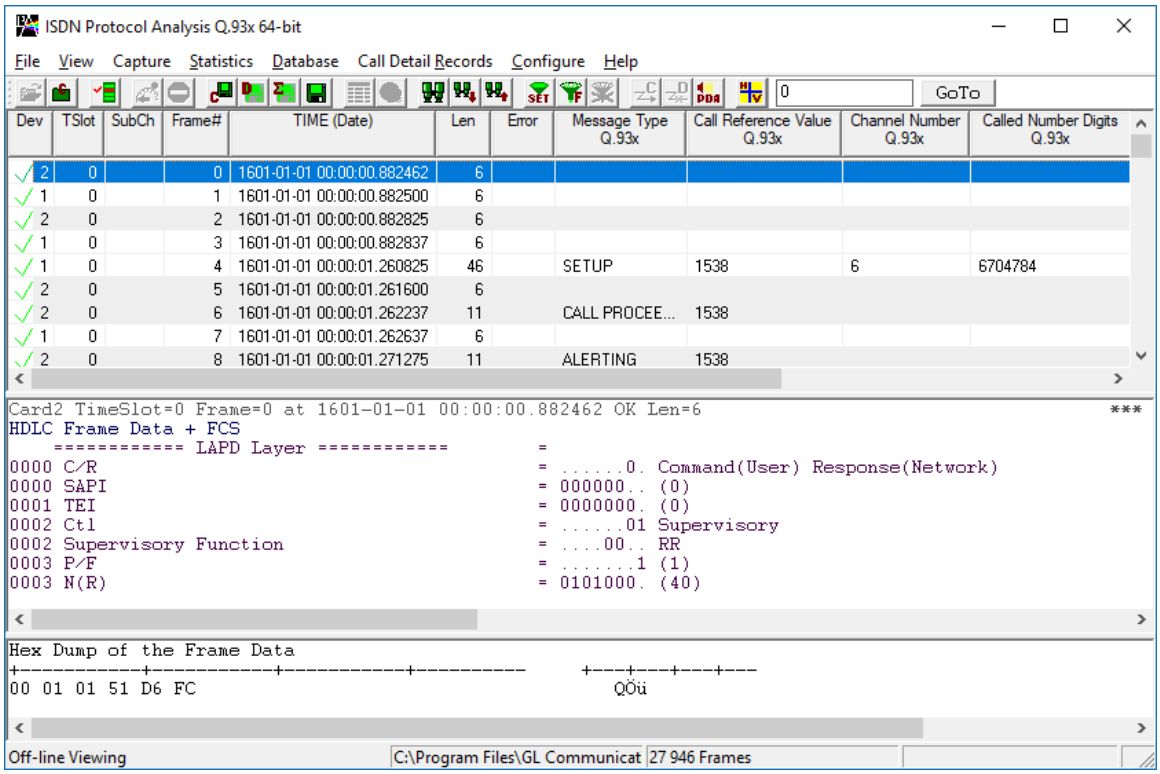
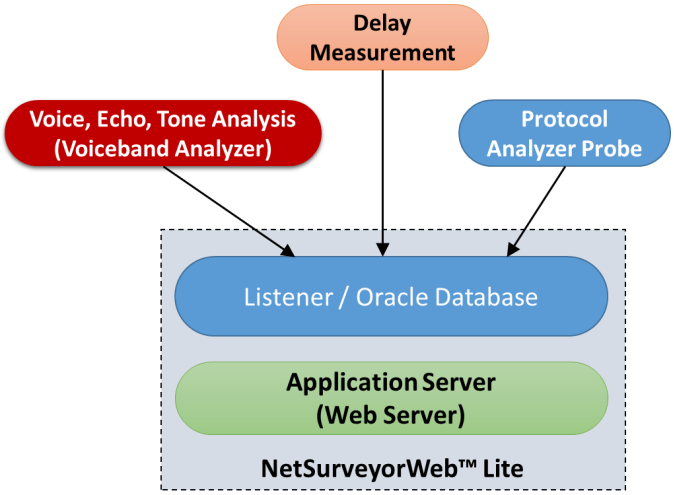


Figure: Summary, Detail, Hex Dump View

NetSurveyorWeb™ Lite

The NetSurveyorWeb™ Lite system comprises of three tier distributed architecture driven by non-intrusive hardware probes, webserver, intelligent software, and a database engine.

All components of the system reside at the PROBE-PC. The architecture allows the user to simply deploy it at multiple locations in the network and perform critical measurements.



Delay Measurement in NetSurveyorWeb™ Lite

- NetSurveyorWeb™ Lite works with Delay Measurement tools to analyze captured voice traffic and provide precise one-way delay metrics.
- For a given call which traverse through Gateway, traffic is sampled at both TDM and IP analyzer at the same point of time running in the same server.
- These captured segments of SIP and ISDN calls will be saved in *.pcm formats. These samples will be given to delay measurement module which compares the time differences between matching burst from the two samples and provides the delay metrics.

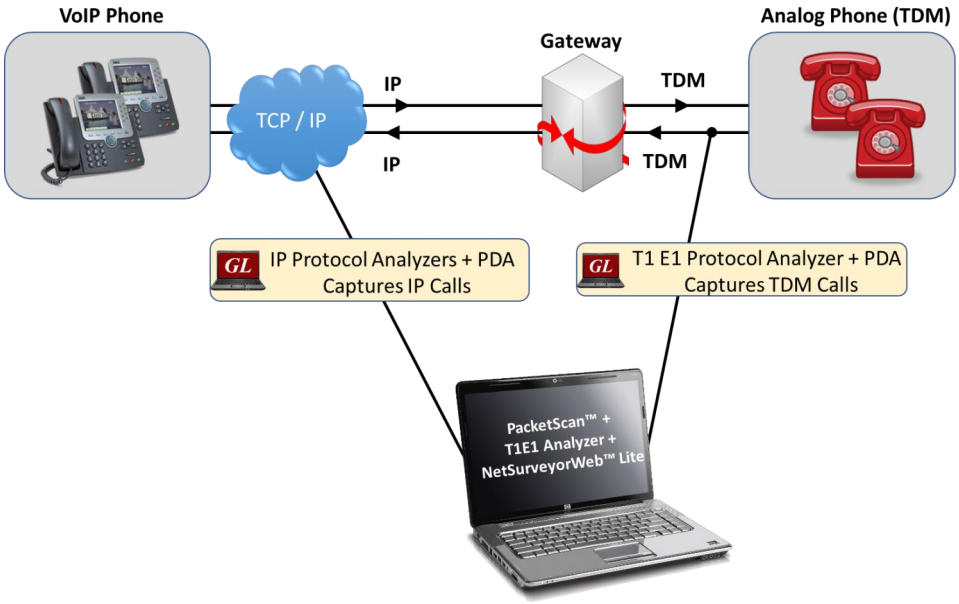


Figure: Measuring Delay in NetSurveyorWeb™ Lite

One-Way Delay Metrics in NetSurveyorWeb™ Lite

All delay metrics from different capture and analysis tools are consolidated into central database and presented in web-browser to drill down to calls-of-interest.

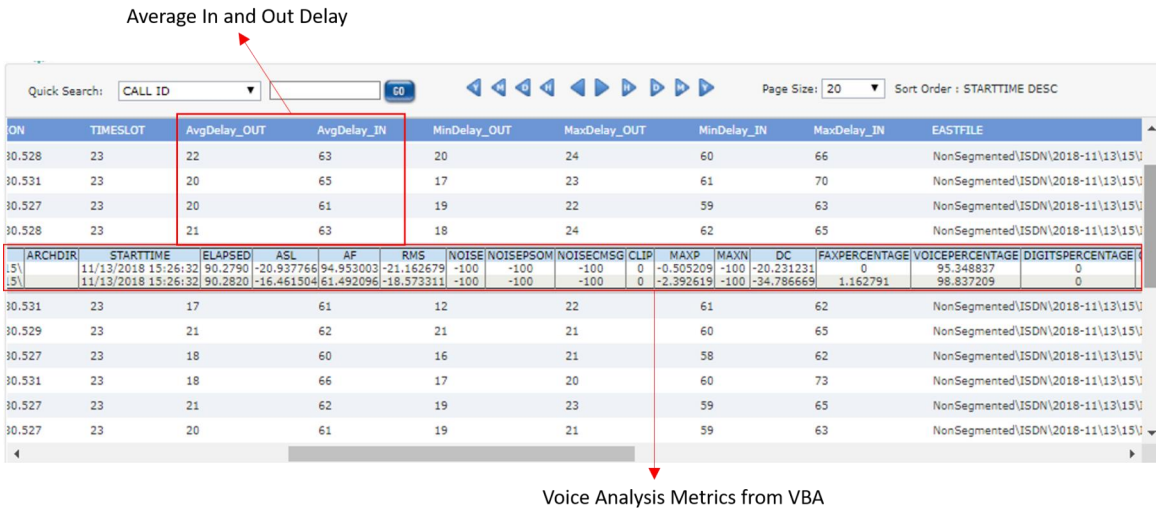
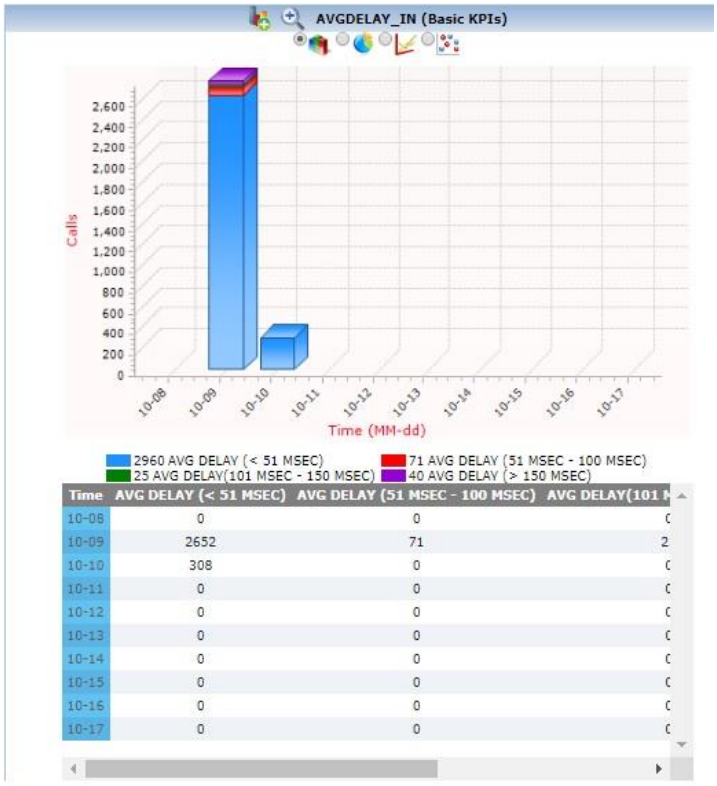


Figure: Delay Metrics in NetSurveyorWeb™ Lite

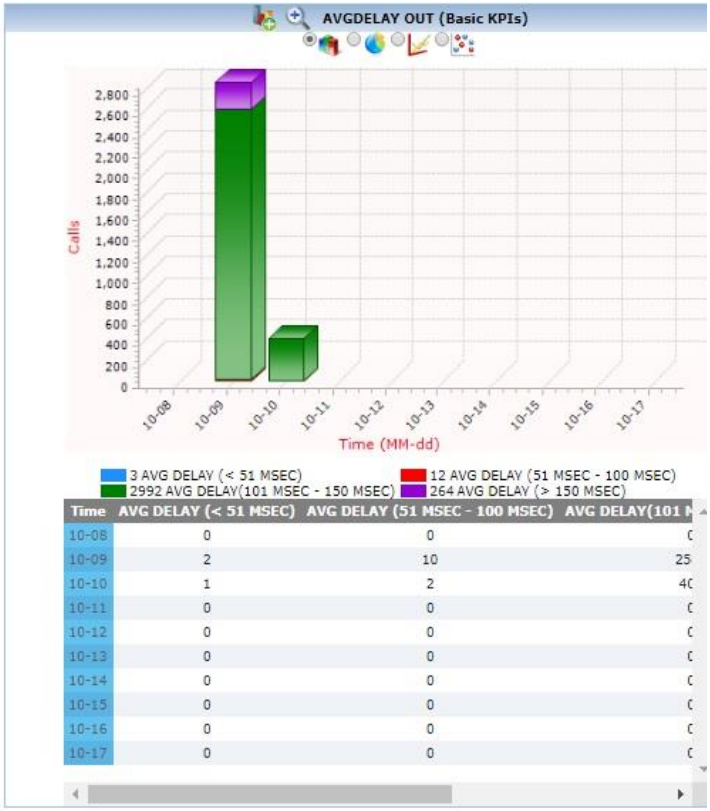
Delay KPI

Average Delay In and Out

The below KPI shows average delay for In and Out direction. It is categorized as <51 sec, between 51-100 Msec, between 101-150 Msec, and greater than 150 Msec.



Time	AVG DELAY (< 51 MSEC)	AVG DELAY (51 MSEC - 100 MSEC)	AVG DELAY(101 M
10-08	0	0	0
10-09	2652	71	2
10-10	308	0	0
10-11	0	0	0
10-12	0	0	0
10-13	0	0	0
10-14	0	0	0
10-15	0	0	0
10-16	0	0	0
10-17	0	0	0



Time	AVG DELAY (< 51 MSEC)	AVG DELAY (51 MSEC - 100 MSEC)	AVG DELAY(101 M
10-08	0	0	0
10-09	2	10	25
10-10	1	2	40
10-11	0	0	0
10-12	0	0	0
10-13	0	0	0
10-14	0	0	0
10-15	0	0	0
10-16	0	0	0
10-17	0	0	0

Buyer's Guide

Item No	Product Description
PKV111	Gateway/Router Performance Metrics

Item No	Related Software
XX100	ISDN Analysis Software (T1 or E1)
XX120	SS7 Analyzer Software (T1 or E1)
VBA032	Near Real-time Voice-band Analyzer
VQT002	Voice Quality Testing (PESQ only)
PKV169	Network Surveillance Lite Software (Does not include PC; Includes Oracle 11g Express Edition and requires respective real-time protocol analyzer licenses on the Probe PC) Requires one of the following protocol analyzer licenses.
PKV100	PacketScan™ (Real-time and Offline) for SIP, MGCP, Megaco, H.323.
PKV103	IP Based GSM & UMTS Analysis, requires PKV100
PKV105	SIGTRAN Analysis, requires PKV100
PKV107	LTE (Long Term Evolution) Analyzer, requires PKV100
XX150	GSM Analysis Software (T1 or E1)

Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer
XTE001	Dual T1 E1 Express (PCIe) Boards
TTE001	tScan16™ T1 E1 Boards
FTE001	QuadXpress T1E1 Main Board
ETE001	OctalXpress T1E1 Main Board plus Daughter Board
UTE001	Portable USB based Dual T1 E1 Laptop Analyzer

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