
Active and Passive Voice Quality Testing

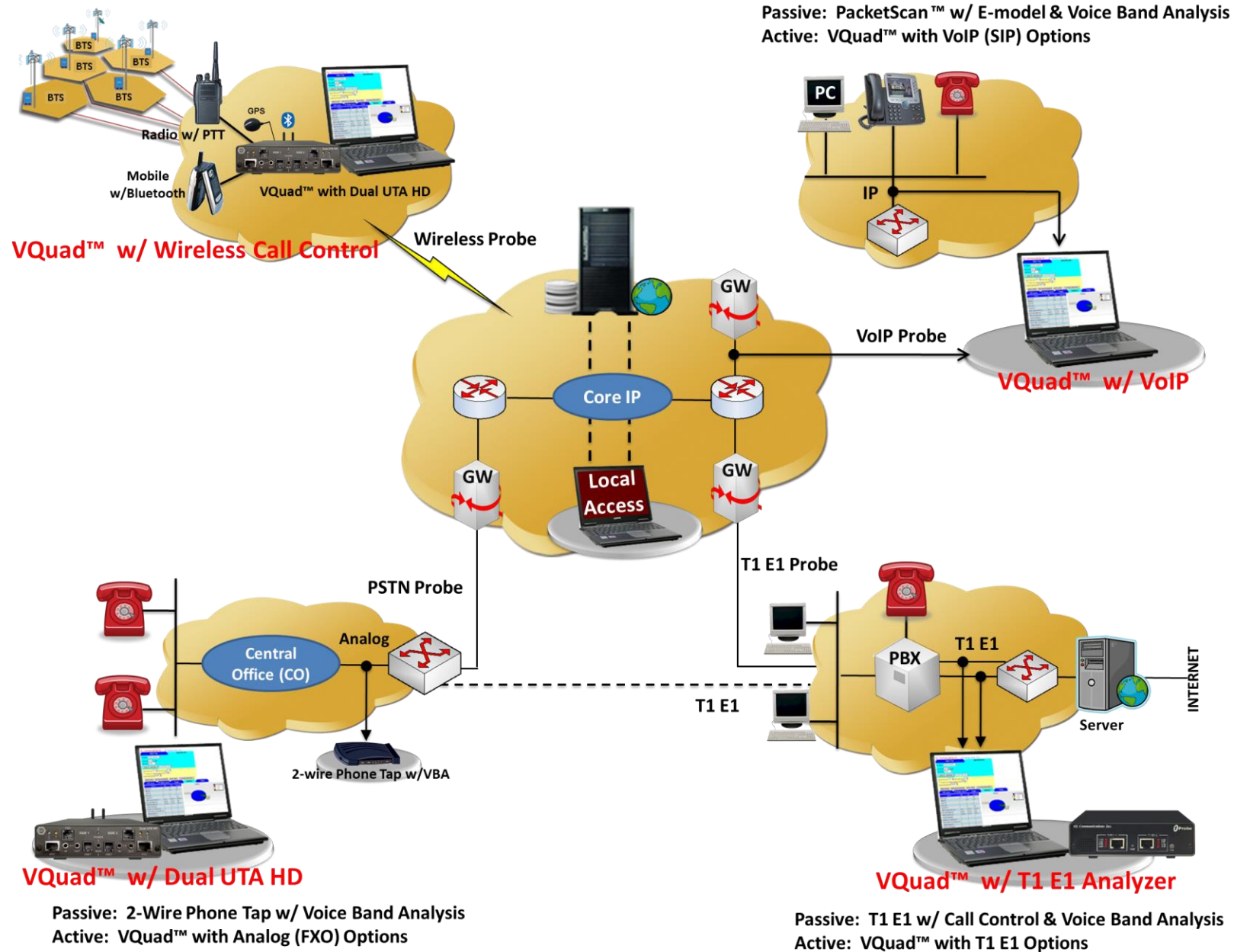


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Active and Passive VQT Network



Active and Passive VQT Network (Contd.)

Active QoS Analysis

- MOS score using ITU Standard Algorithms POLQA NB/WB/SWB and PESQ LQ/LQO/WB
- Additional Metrics include Jitter, Clipping, Levels, Latency
- Automated operation
- Results saved to database with full featured Query functionality
- Graphical and Tabular results can be exported to file

Passive QoS Analysis

- Call Quality Of Service (QOS) for all calls with E-Model based (G.107) Mean Opinion Score (MOS) and R-factor with individual and summary statistics presented in graphical and tabular formats
- MOS score for VoIP Networks using E-Model
- Near Real-Time QoS Measurements of All Networks
- Line Echo and Acoustic Echo Measurements
- Automated operation
- Results can be exported to file

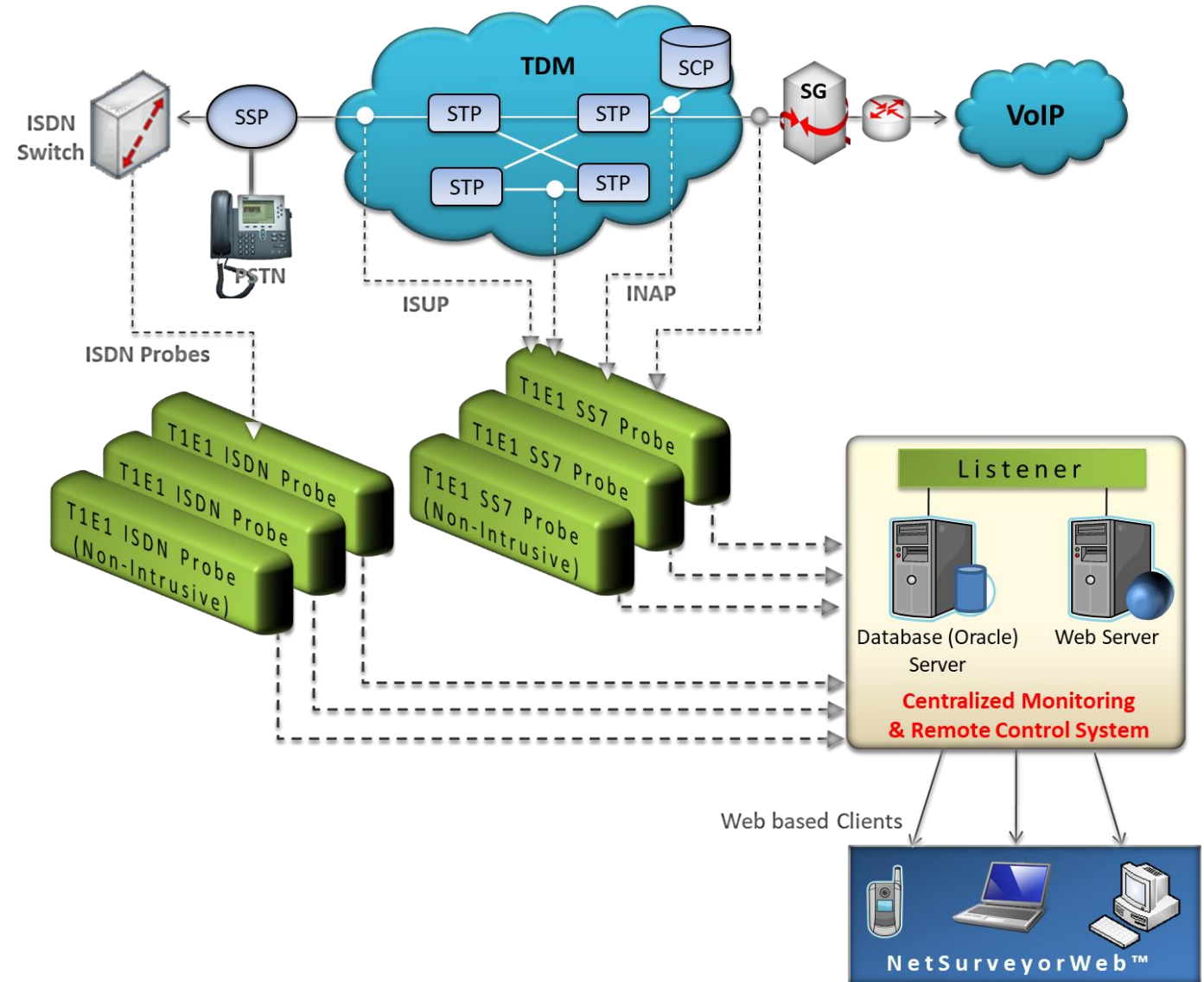
Active/Intrusive Network Monitoring System

Call Simulation Tools

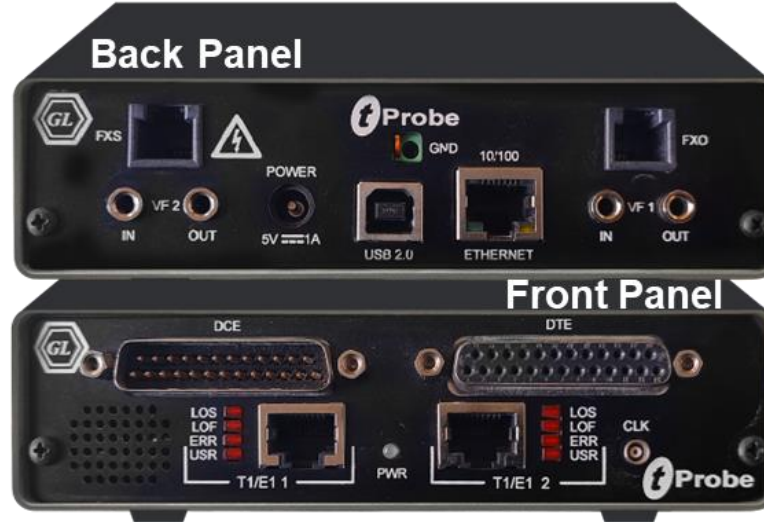
- Wireless Call Automation
 - Call Automation (automated call control of Wireless / WiFi phones)
- Products Applicable
 - VQuad™, MAPS-GSM A, GSM Abis, TRAU, LTE
- VoIP Call Simulation and Automation
 - Soft Phone Simulation (SIP, RTP, MGCP, MEGACO, SIGTRAN, and H.323 supported)
- Products Applicable
 - MAPS-SIP, MGCP, MEGACO, SIGTRAN
 - VQuad™
- TDM Call Simulation and Automation
 - T1/E1 Call Simulation (CAS, PRI ISDN and SS7 supported)
 - Analog 2-wire Phone Simulation (FXO)
- Products Applicable
 - T1/E1 Analysis Cards with CAS simulator, MAPS-ISDN, ISDN Emulator, & MAPS-SS7
 - MAPS™ Central Office Switching Simulation (MAPS™ CO)– CAS, SS7, ISDN
 - MAPS™ CO Analog Phone Simulator (APS)
 - MAPS™ CO Phone Simulator (BPS)
 - VQuad™

TDM Call Simulation

- T1 E1 Analysis Cards with CAS simulator, MAPS-ISDN, ISDN Emulator, and MAPS-SS7
- MAPS™ Central Office Switching Simulation (MAPS™ CO) – CAS, SS7, PRI ISDN
- MAPS™ Analog Phone Simulator (APS)
- VQuad™



T1 E1 Cards/Units with CAS, ISDN, SS7 Simulation



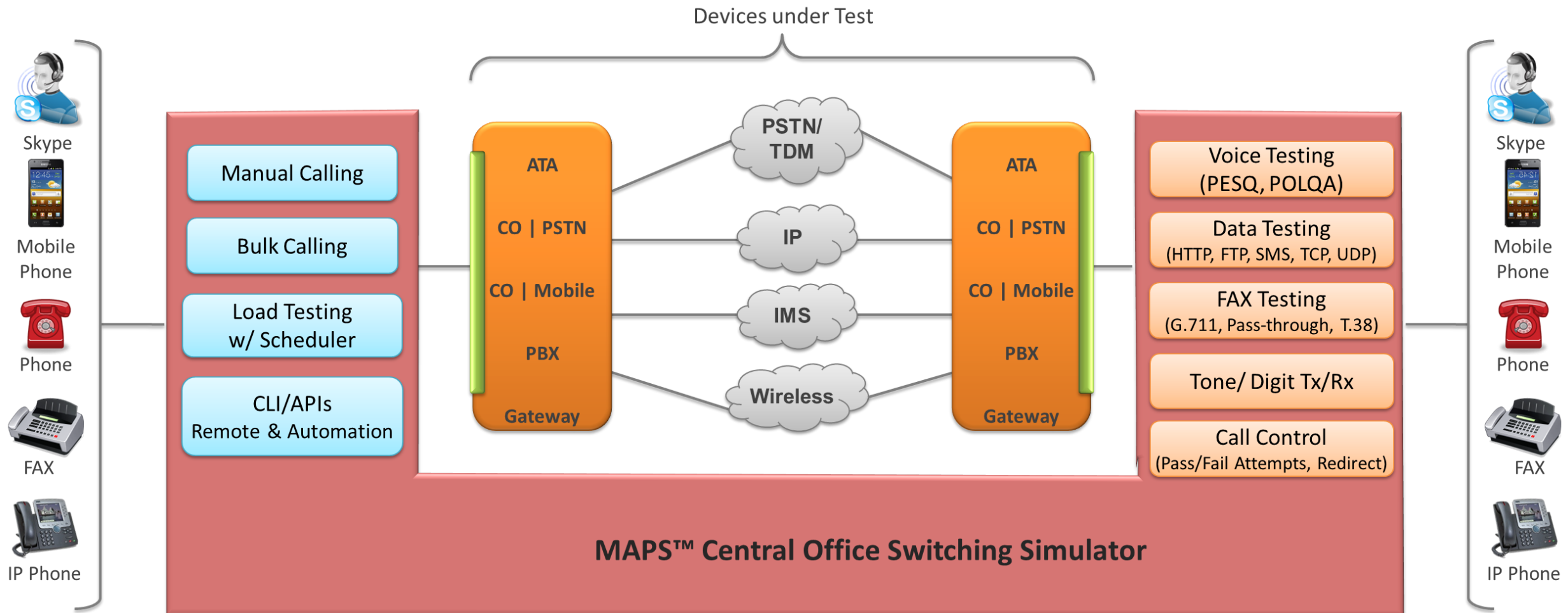
tProbe™ T1 E1 Analyzer



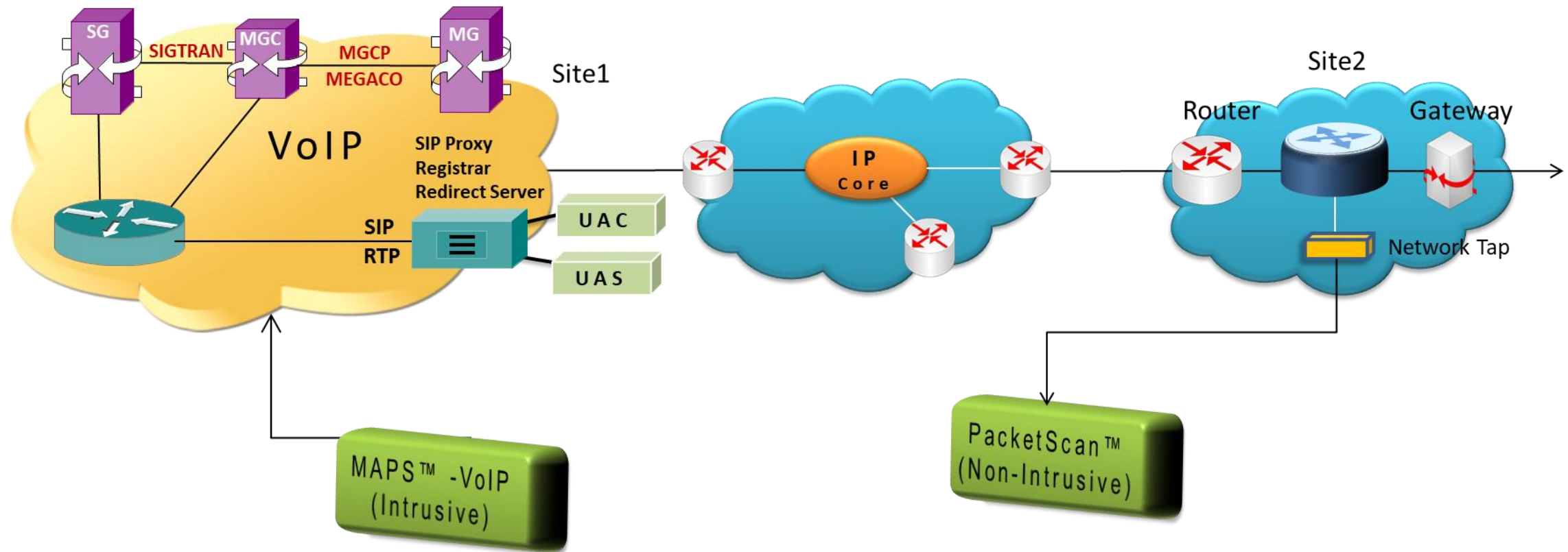
Dual T1 E1 Express (PCIe) Board

- TDM Call Simulation
 - Used for installation, test, and troubleshooting of T1 E1 lines
 - Capability of T1 or E1 PCM signal visualization, capture, storage, analysis, and emulation
 - Includes BERT, voice band analysis, data, signaling, and protocol analyzer all in one
 - Perform analysis and emulation of various signal types including voice, digits, and tones;
 - Simulation of various protocols including ISDN, SS7, CAS, and many more

MAPS™ Central Office Switching Simulation



VoIP Call Emulation

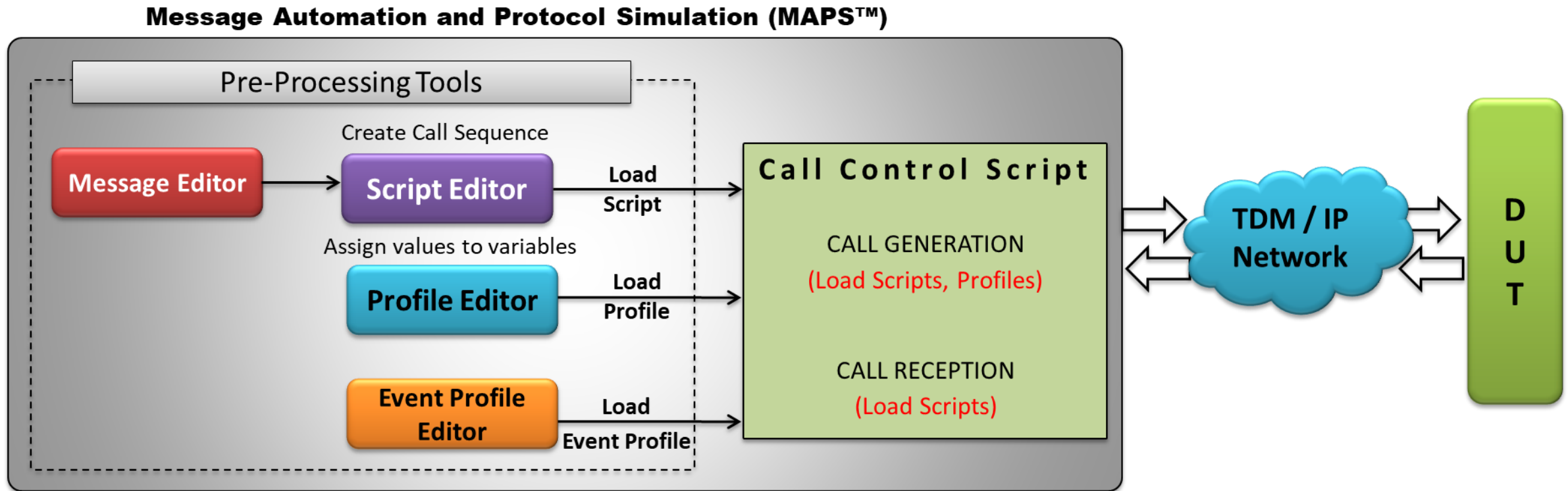


MAPS™ - An Overview

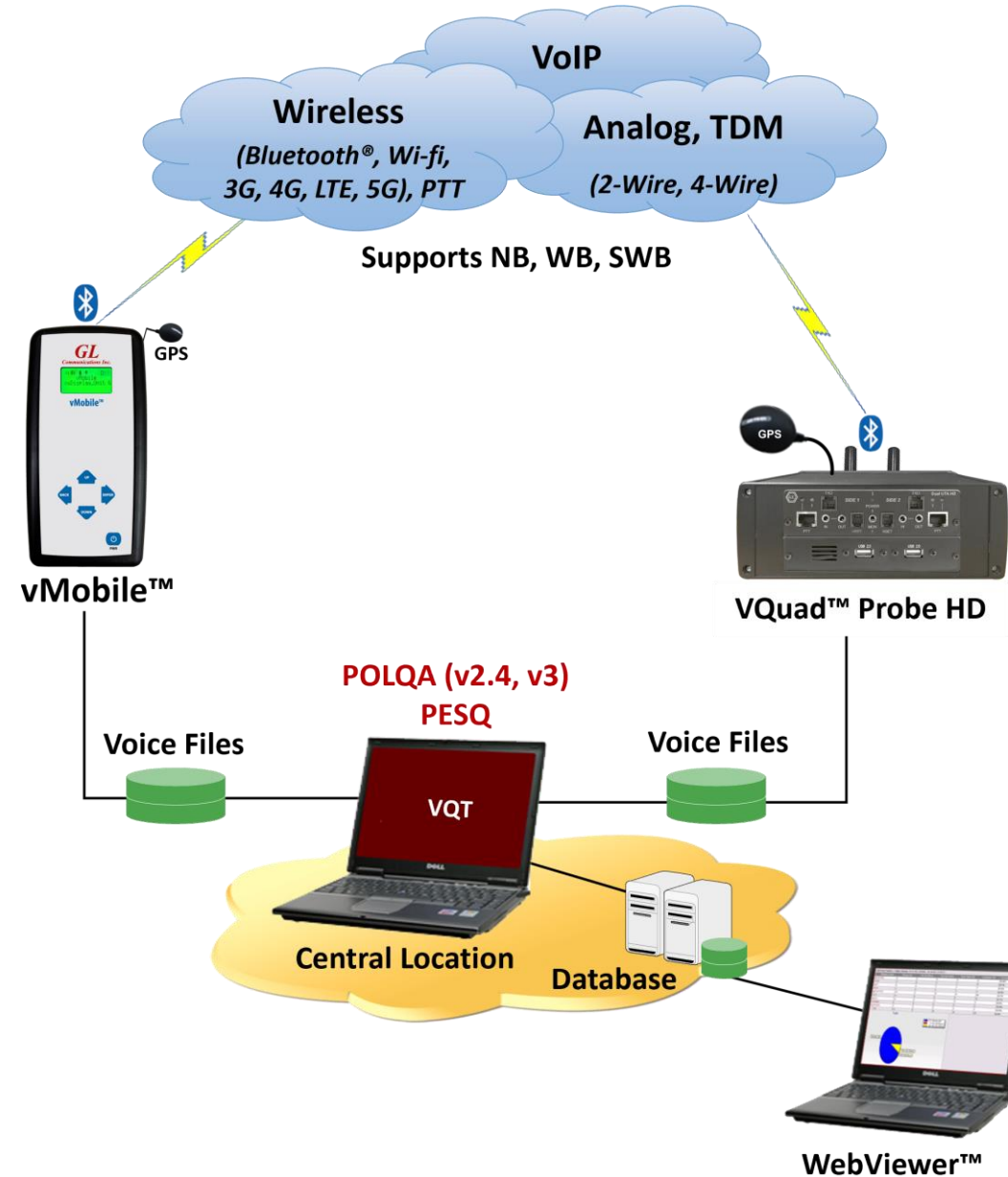
- VoIP call emulation
- Protocol emulation and conformance test tool
- Complete analysis and emulation capability on par with any protocol tester in the market
- Supports variety of protocols such as MGCP, SIP, MEGACO, SS7, ISDN, GSM, and others
- Includes various test plans and test cases to support the testing of a real-time scenario
- MAPS™ MAP Emulator supports powerful utilities like Message Editor, Script Editor, and Profile Editor which allow new scenarios to be created or existing scenarios to be modified using MTP3 layer (over TDM) and M3UA, M2PA layers (over IP) messages and parameters. Provides fault insertion, and erroneous call flows testing capability
- Functional testing and conformance testing of network elements
- Ready scripts makes testing procedure simpler, less time consuming and hence time to market products

MAPS™ Working Principle

VoIP Call Emulation



Active Voice Quality Monitoring System with VQuad™/vMobile™

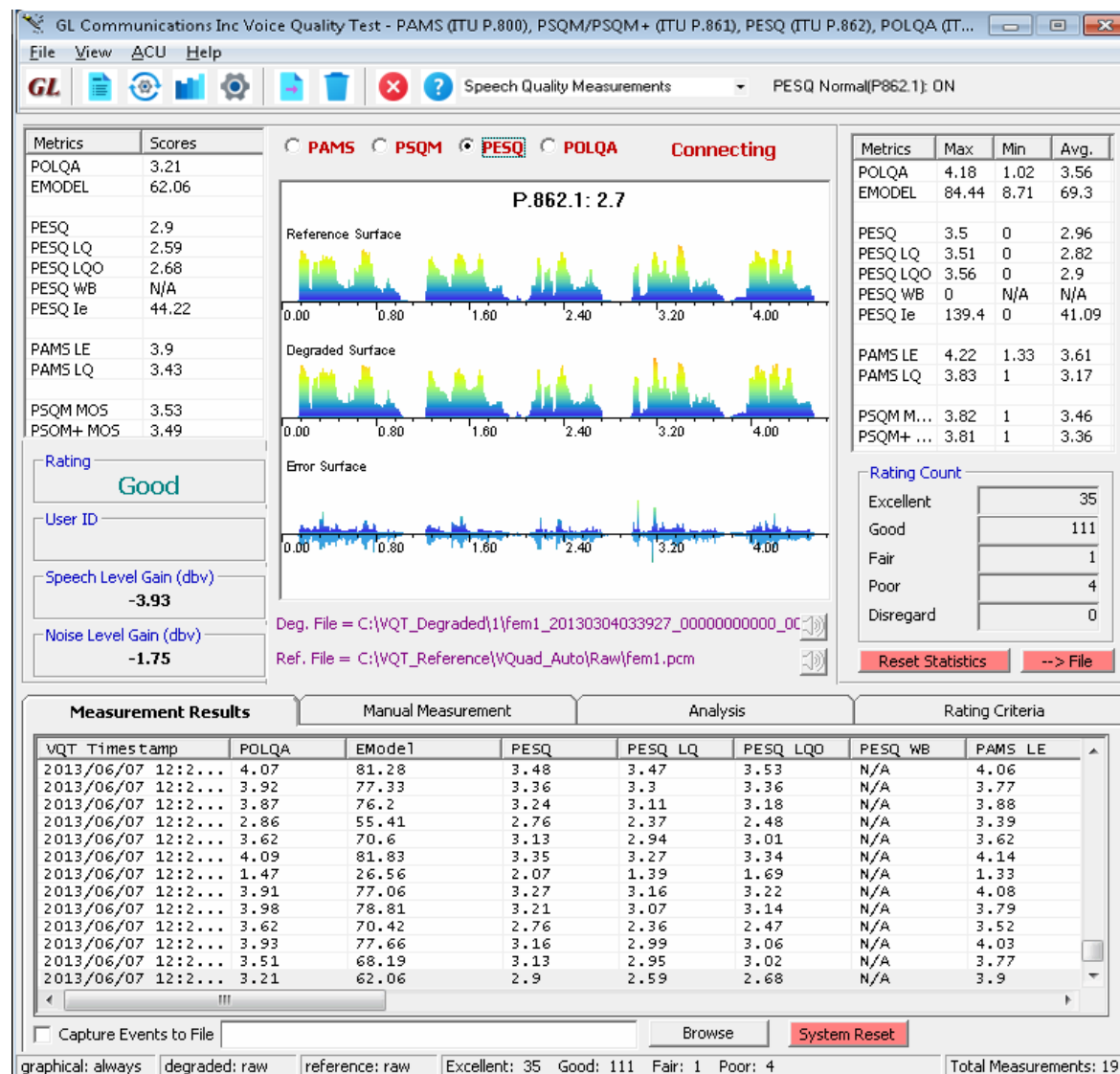


VQuad™ Highlights

- Up to 12 simultaneous devices (including two Dual UTAs)
- Automated call control & traffic scripting
- Voice Band Analysis for all interfaces
- DTMF / MF and Frequency Tone Transmit / Detect
- Round Trip Delay, One Way Delay, Echo Measurements
- Drive Testing with GPS Mapping (most countries supported)
- Indoor Track System (ITS) allows to test the VQT in remote and unreachable GPS signal places (ex: underground)
- Remotely Accessible

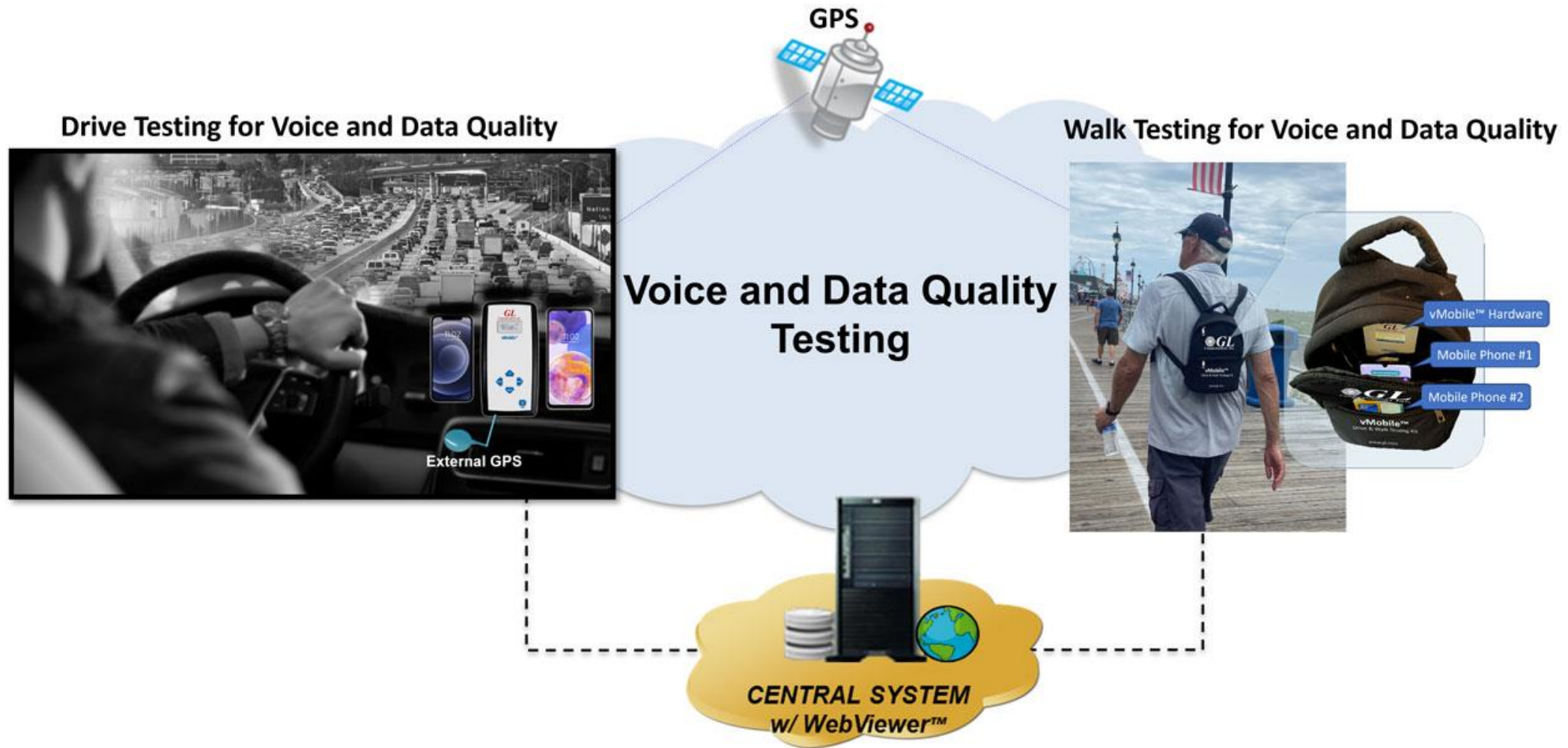
VQT Application

- ITU P.862.1 (PESQ)
- Auto-Measurement
- Detailed Results
- Criteria Rating
- Remote Access
- Round Trip Delay
- Jitter, Clipping, Levels



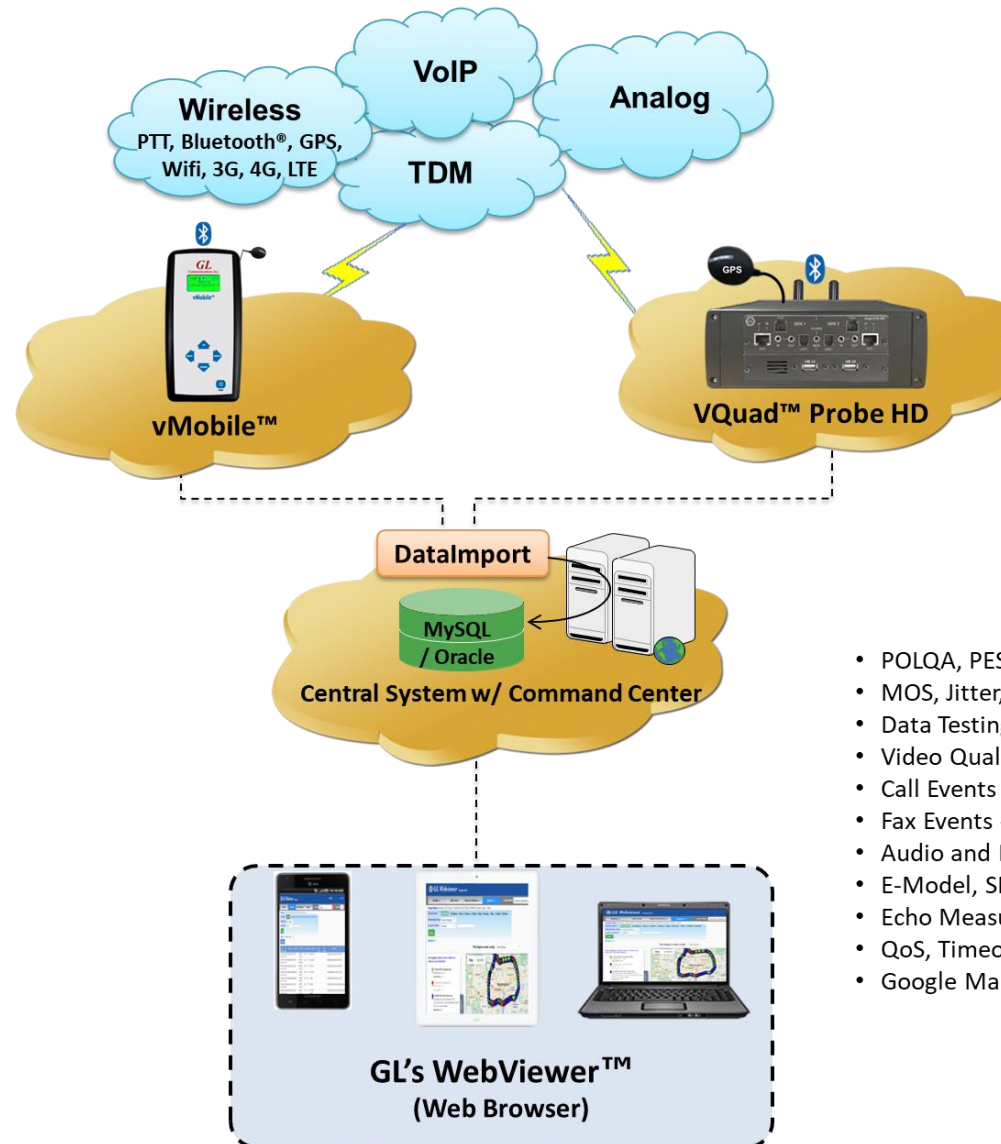
Drive and Walk Testing

Active Voice Quality Monitoring System



WebViewer™

- Accessible remotely via browser-based clients
- Multi-user support, and user-friendly interface
- Database stores the real-time and historic data collected
- Provides database query methods in order to query VQT results, and gather status, statistics, events
- Results are displayed both in tabular and graphical formats
- Customized statistics
- Remote Access of all Network applications
- Web Based browser accessing central database (Oracle or MySQL)
- All results/measurements/events from VQuad™, VQT, VBA automatically sent to central database via TCP/IP



- POLQA, PESQ LQ/LQO/WB
- MOS, Jitter, Clipping, Speech and Noise Levels
- Data Testing - Wired and Wireless Networks
- Video Quality Test Results
- Call Events - Progress & Failures
- Fax Events - Encoding, Resolution, ECM
- Audio and Delay Analysis
- E-Model, SNR, Signal Level
- Echo Measurements - ERL, Delay
- QoS, Timeouts, Retransmissions
- Google Mapping

WebViewer™ Features

- Accessible remotely via browser-based clients
- Multi-user support, and user-friendly interface
- Database stores the real-time and historic data collected
- Provides database query methods to query VQT results, and gather status, statistics, events
- Results are displayed both in tabular and graphical formats
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WebViewer™ Records

GL Webviewer

Results

Call Events

Status & Statistics

Reports

Load Filters:

--Select Filter--

VQT-PESQ Results between 11/09/2022 05:21:05 and 05/09/2023 05:21:05 (Last 6 Months)

Date & Time

Standard10 Minutes1 Hour12 Hours24 HoursTodayYesterday7 Days1 Month6 Months

Timestamp Type

VQuad / vMobile Timestamp

Event ID Filter

Contains

Apply

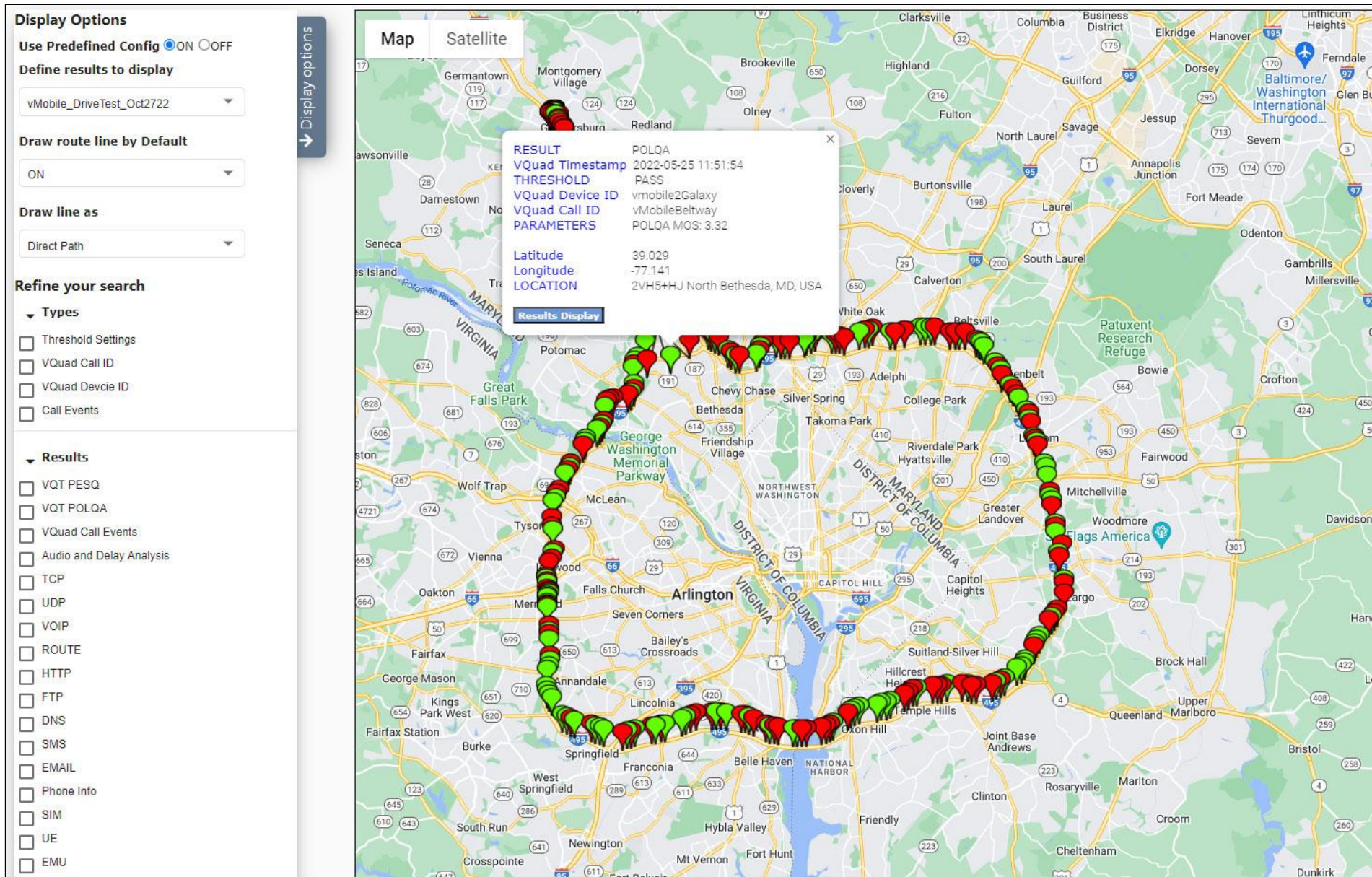
Actions

Records Per Page:

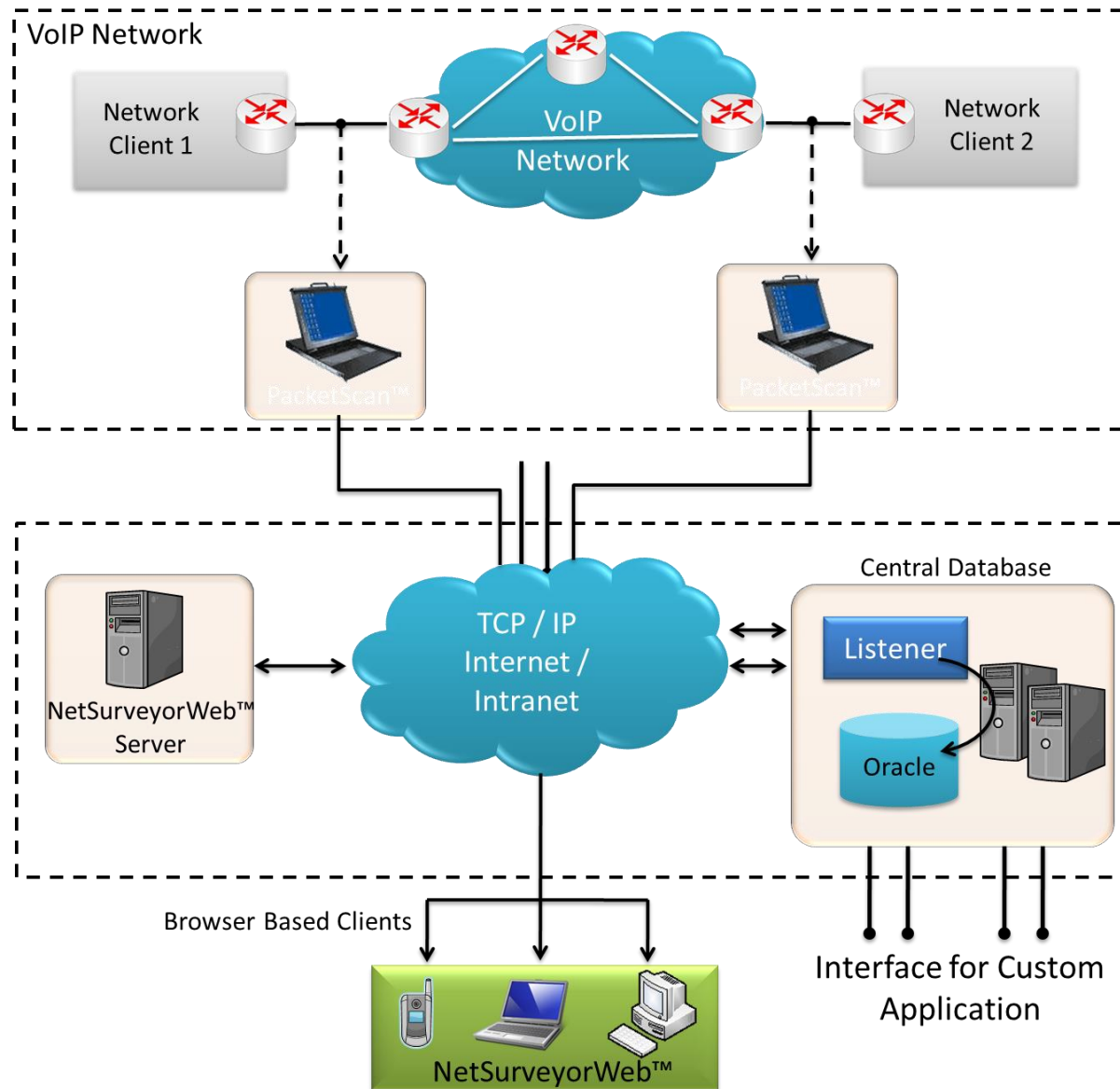
200

VQuad Timestamp	Call Timestamp	VQuad Call ID	VQuad Device ID	VQuad GPS	Latitude	Longitude	Degraded Filename	Rating	PESQ	DAQ	PESQ LQ	PESQ LQO	PESQ WB	PSQM PLUS	PESQ Average Offset (ms)	PESQ Max Offset (ms)	PESQ Min Offset (ms)	Number All Clipping
03/27/2023 15:34:34	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX02		39.14	-77.22	fem1		3.71	5	3.79	3.83		0	661.45	661.5	661.38	0
03/27/2023 15:34:23	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX01		39.14	-77.22	fem1		3.34	4.7	3.26	3.33		0	618.52	618.62	618.5	0
03/27/2023 15:34:11	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX02		39.14	-77.22	fem1		3.37	4.7	3.31	3.37		0	648.1	648.12	648	0
03/27/2023 15:34:00	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX01		39.14	-77.22	fem1		3.37	4.7	3.32	3.38		0	625.02	625.12	625	0
03/27/2023 15:33:49	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX02		39.14	-77.22	fem1		3.38	4.7	3.32	3.38		0	648.85	648.88	648.75	0
03/27/2023 15:33:38	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX01		39.14	-77.22	fem1		3.39	4.8	3.35	3.4		0	606.4	606.5	606.38	0
03/27/2023 15:33:26	03/27/2023 15:26:14	GLRobFaxVQTTest	RobFX02		39.14	-77.22	fem1		3.37	4.7	3.31	3.37		0	743.5	743.62	743.38	0

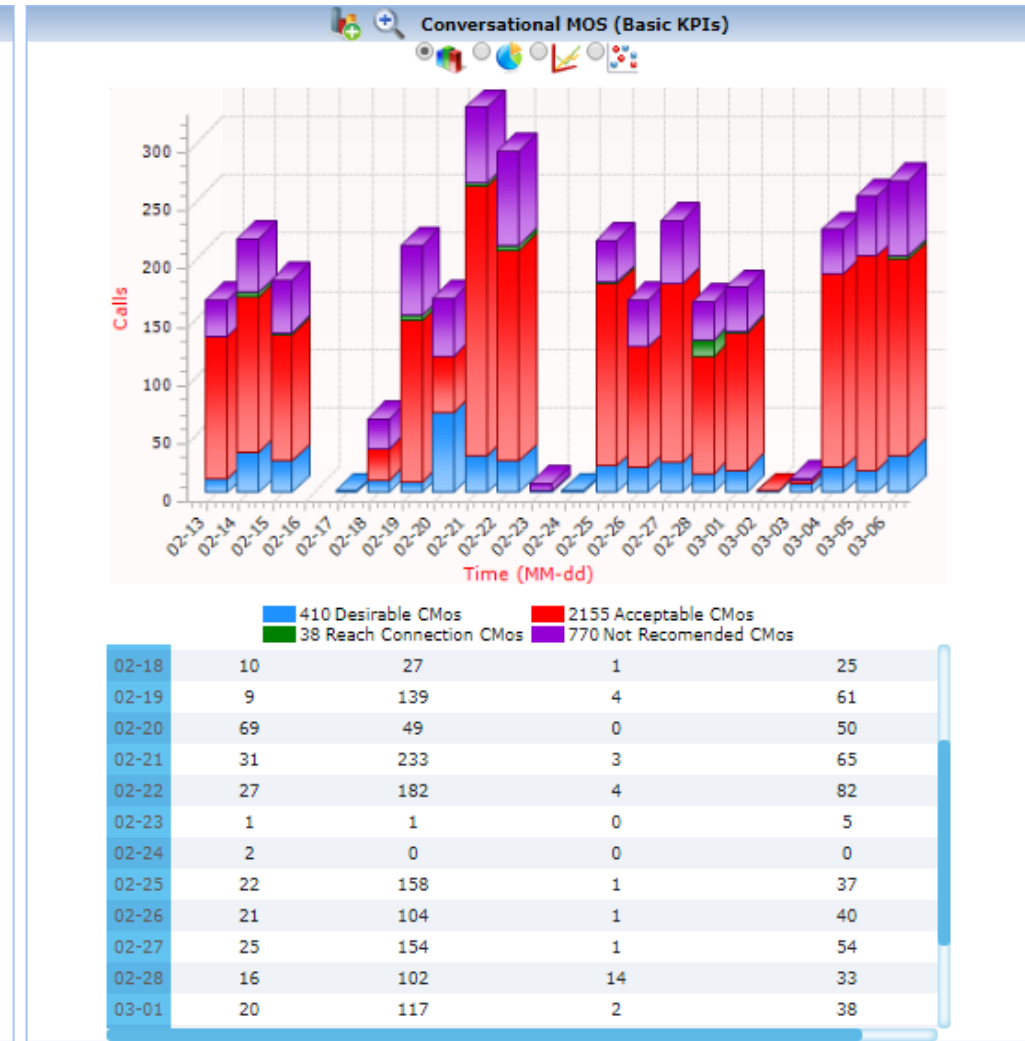
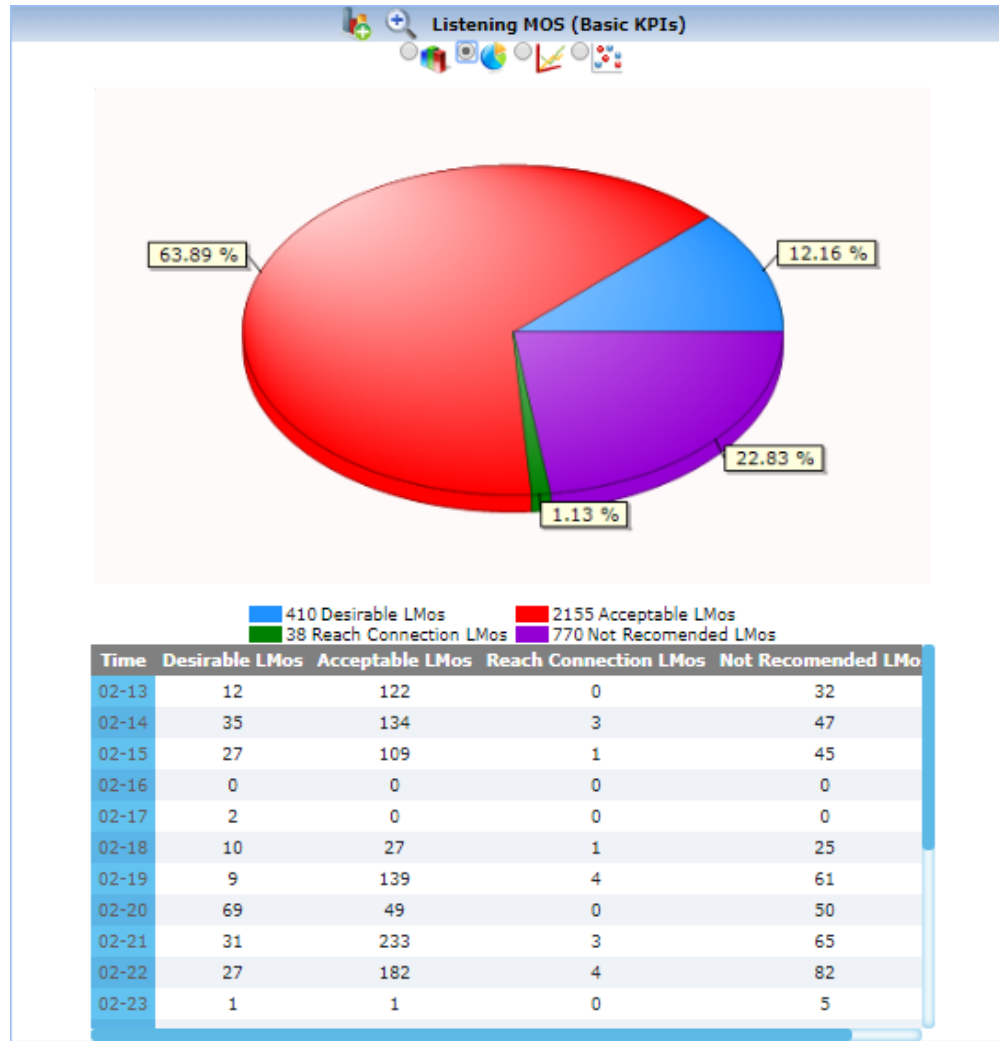
Google Map Plotting



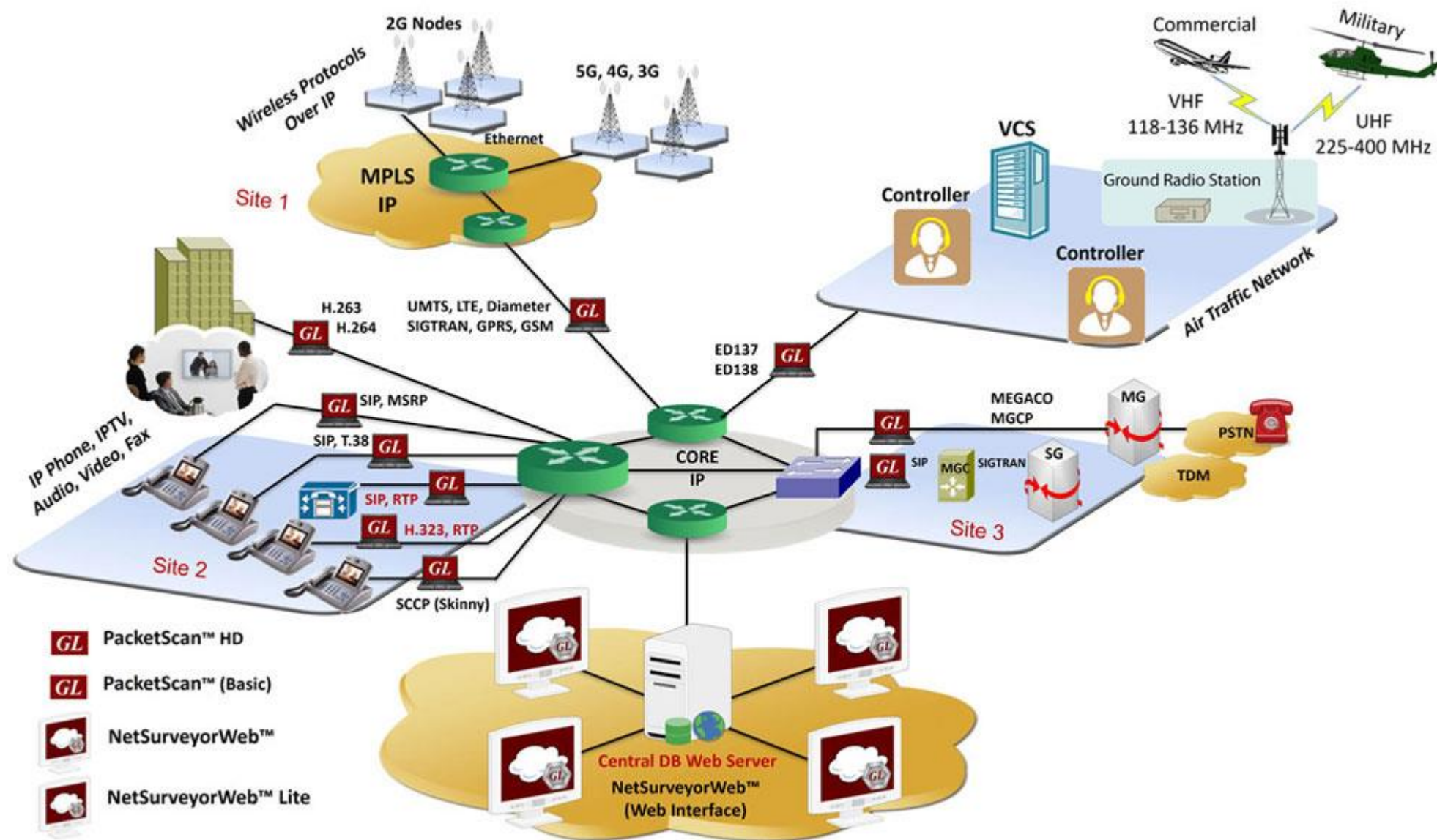
Passive / Non-Intrusive Packet Monitoring and Surveillance System (VoIP)



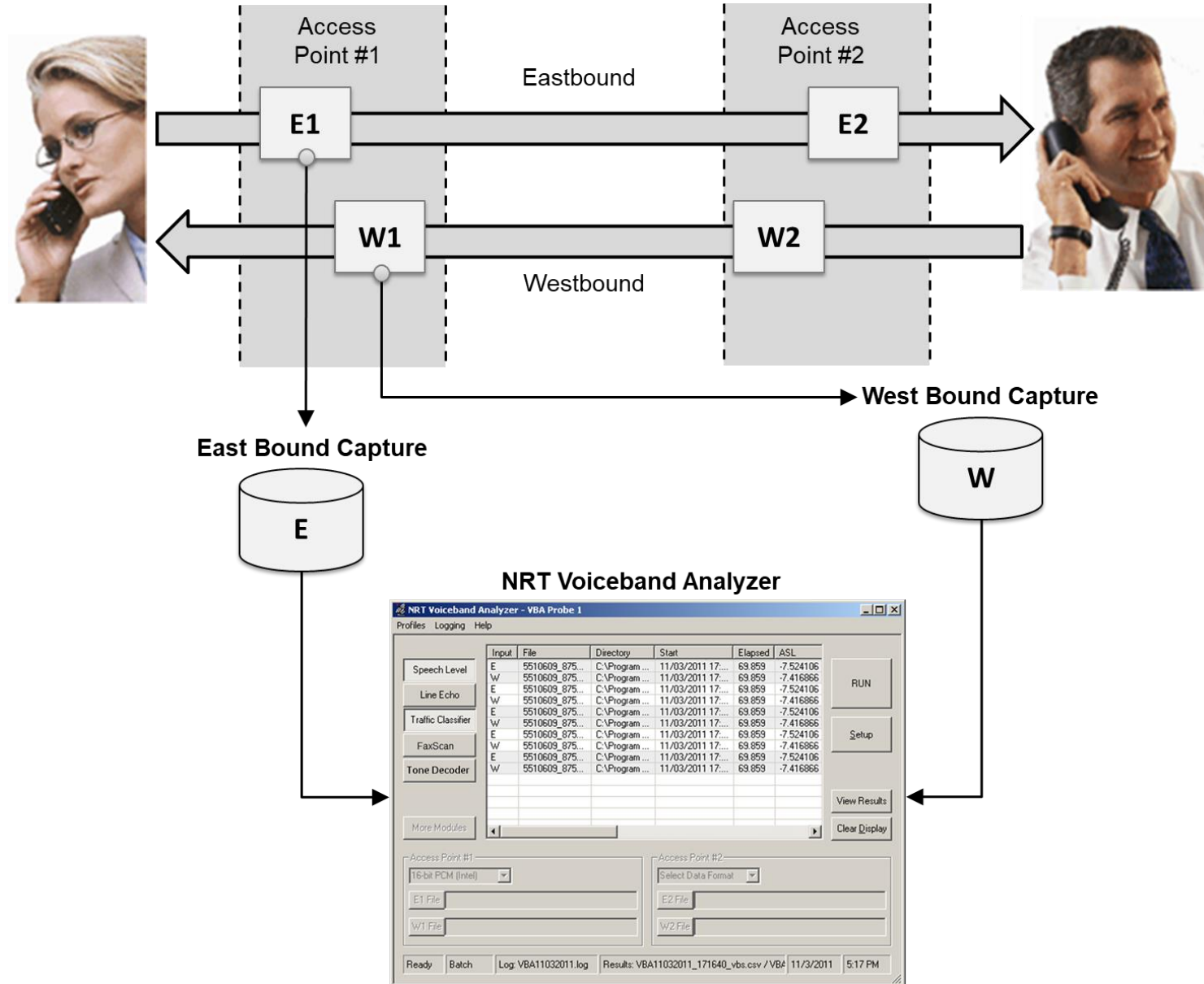
NetSurveyorWeb™ - Reports View



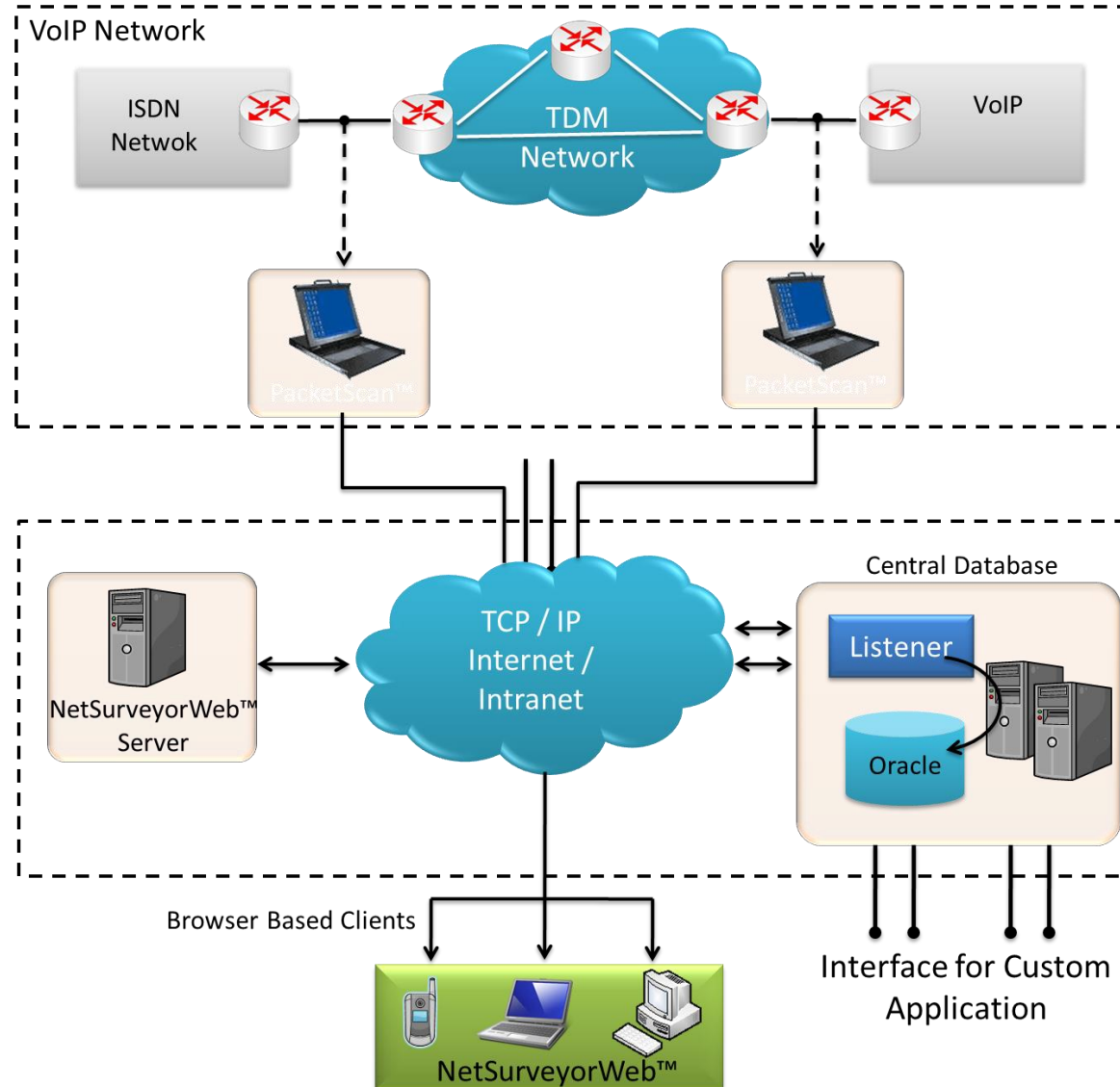
GL's PacketScan™



Voice Band Analyzer (VBA)



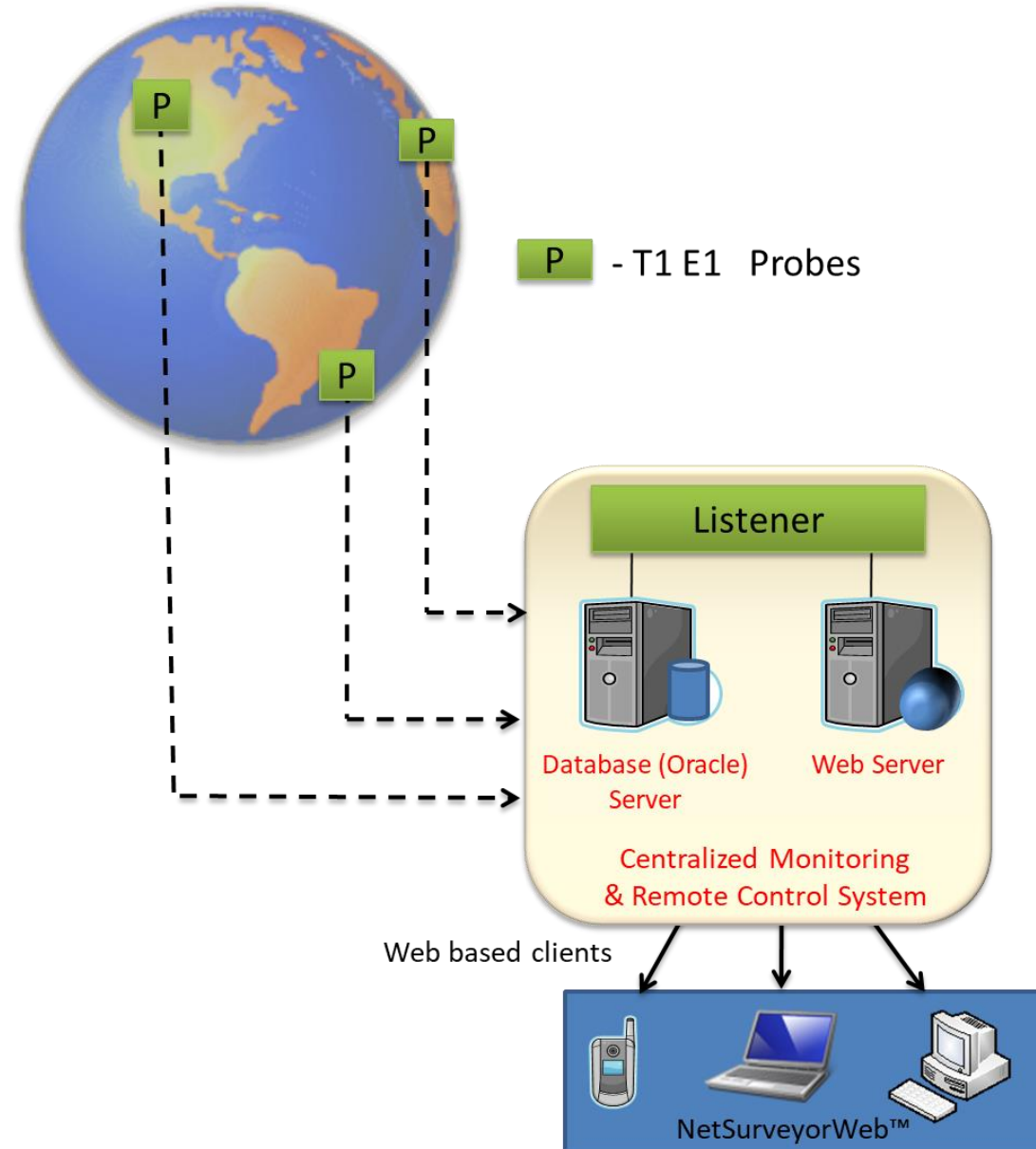
Passive Network Surveillance System (TDM, Wireless)



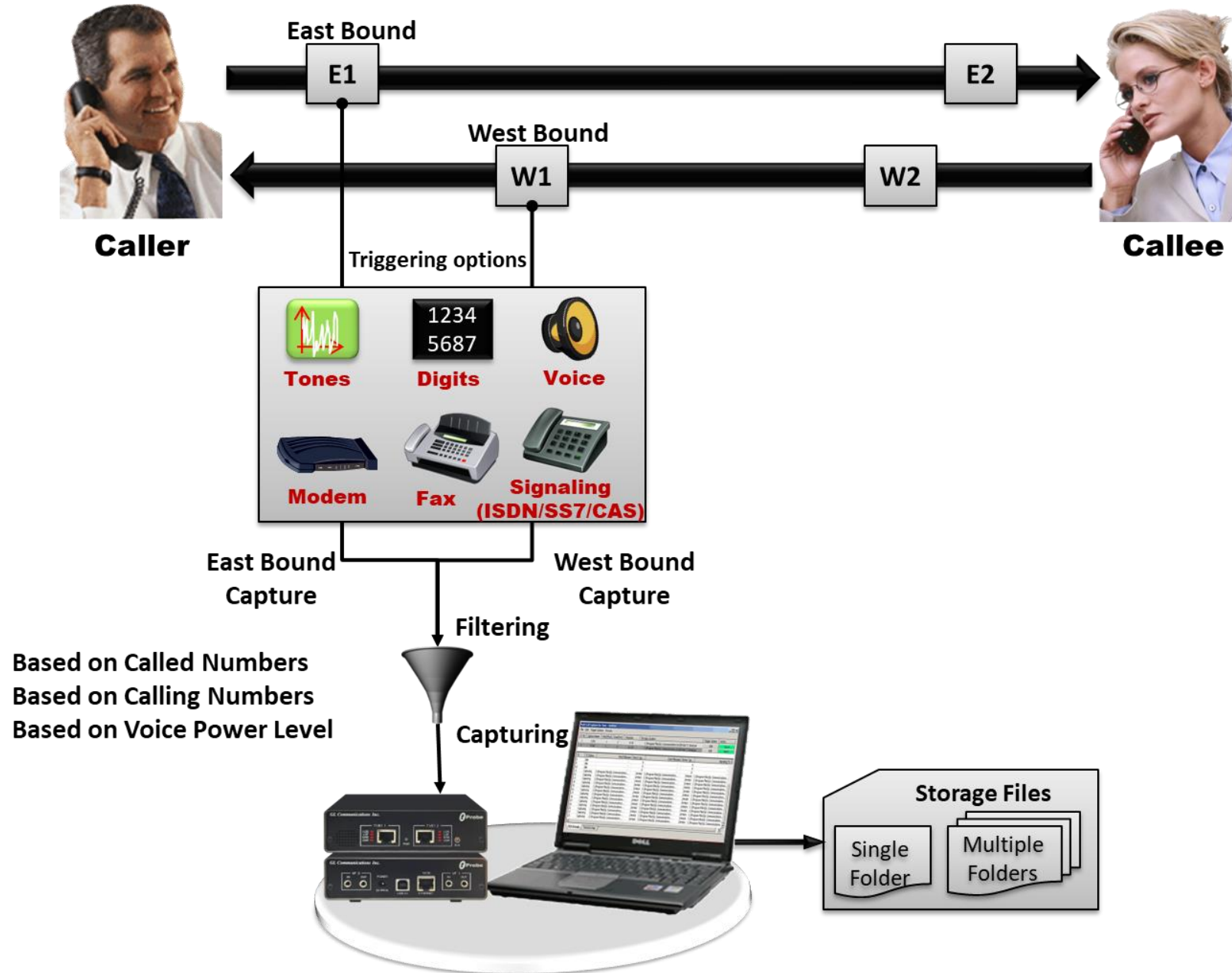
T1 E1 / IP

Passive TDM, Wireless Probes

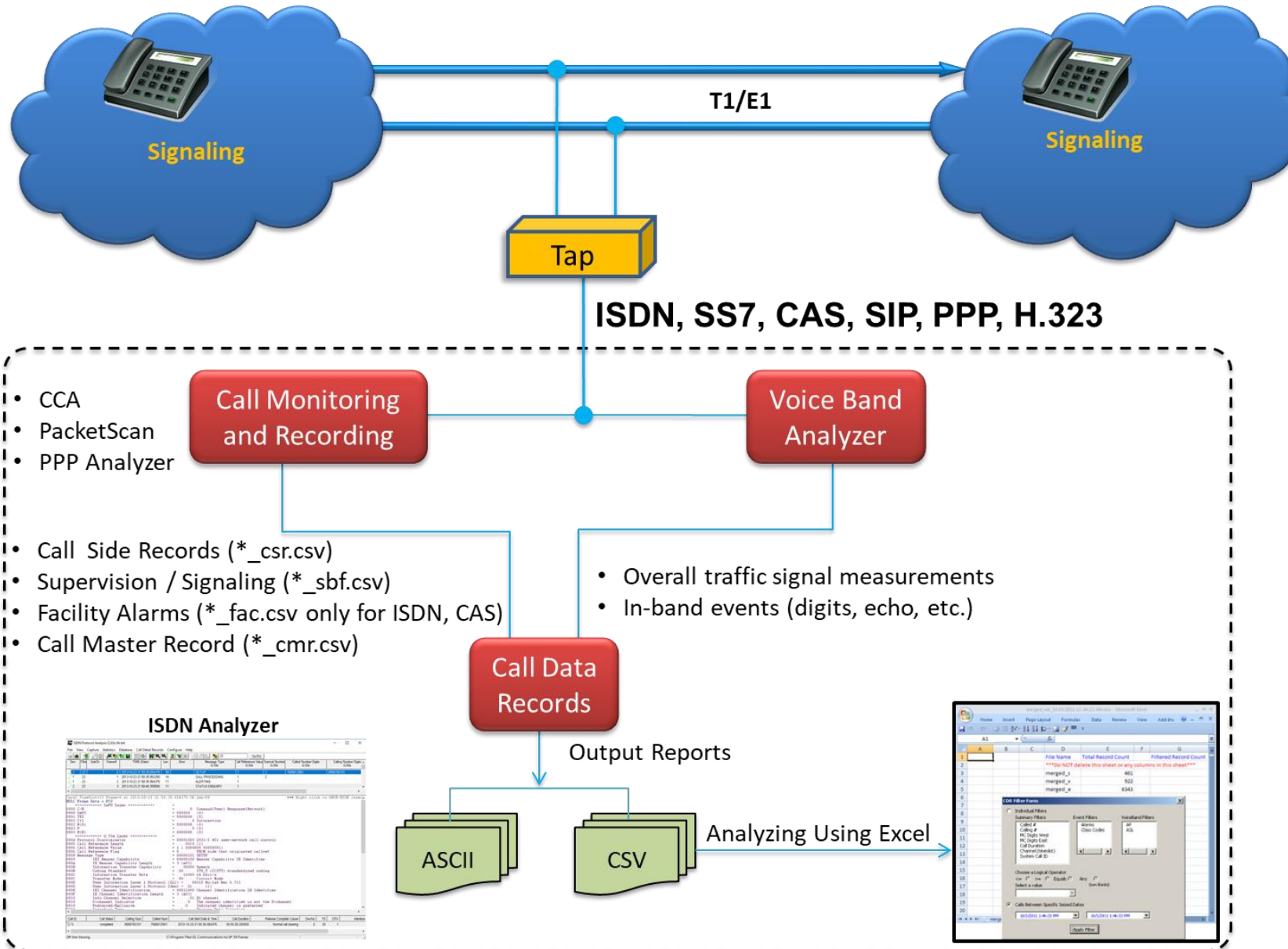
- Many Probes in multiple Locations
- Monitoring Many Types of Data (Alarms, Protocols, QOS Statistics)
- All Probes Connected to Centralized Storage Location (Database)



Call Capture Analysis (CCA)



Call Data Records (CDR)



Application Summary

Part #	Description
VQT004	Voice Quality Testing (VQT) Software (PESQ LQ/LQO/WB)
VQT500	MobNetMon™
VQT010	VQuad™ Software (Stand Alone)
PKV100	PacketScan™ (Online and Offline)
PKS120	Message Automation & Protocol Simulation (MAPS™) for SIP
PKS122	Message Automation & Protocol Simulation (MAPS™) for MEGACO
PKS124	Message Automation & Protocol Simulation (MAPS™) for MGCP
VBA032	Near Real-time Voice-band Analyzer
VQT035	FXO RJ11 Hardware Tap and Audio Capture Software
VQT241	Dual Universal Telephony Adaptor (UTA)

Thank you