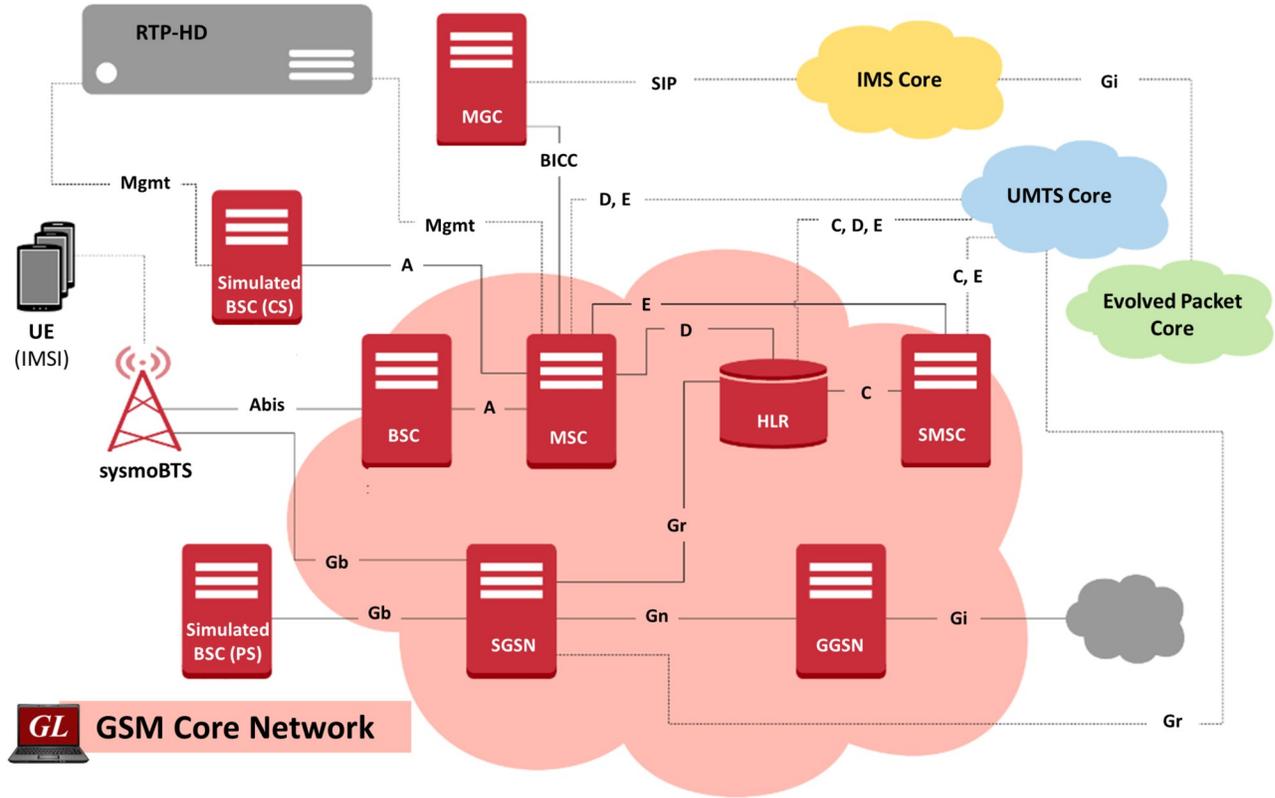


2G GSM GPRS Network Lab Simulation



Overview

GL offers an End-to-End 2G and 2.5G GSM GPRS Wireless Network Simulation Test Suite with all components such as Base Station, RF channel, GSM core network elements such as BSC, MSC, HLR, and GPRS core elements such as SGSN, and GGSN to support mobile call and traffic emulation. The lab system can operate with real mobiles, or simulator user profiles.

By mimicking real-world customer behavior in lab environments, our solutions allow mobile operators and equipment manufacturers to verify their wireless networks before deployment. In other words, one can setup a virtual real-time network emulating all the network elements using "MAPS 2G Wireless Lab Suite". The test suite supports simulation of GSM Abis, A, C/D/E, Gb, and Gn/Gp interfaces.

In addition, with MAPS™ HD RTP appliance you can generate high call intensity (hundreds of calls/sec) and high volume Voice and SMS calls (thousands of simultaneous calls/platform).

MAPS™ supports automated stress/load testing capabilities through Load Generation and Bulk Call Simulation features. To perform Bulk Call Generation, several UE/Subscriber configuration files are required. The UE/Subscriber configuration files can be created using regular Profile Editors (XML Based), using CSV based profiles, or using Auto Generation feature for emulating inter-networking calls, roaming calls, data sessions, and bulk GTP traffic generation.

Complete 2G GSM lab simulation can be realized using GL's [Remote MAPS™](#) feature, a client server module, designed for multi-node multi-interface simulation from a single GUI. The application has the ability to remotely control multiple MAPS™ Servers running on different PCs from a single remote client application.

For more details on 2G GSM GPRS Lab Network Simulation, refer to [2G GSM GPRS Communications Network Lab](#).



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

Features

Supported Procedures

Mobile to Mobile Procedure

- Registration
- Location update
- Mobile Originated Voice Call (MOC)
- Mobile Terminated Voice Call (MTC)
- Mobile Terminated SMS Call
- Mobile Originated SMS Call

Mobile to Landline Procedures

- Channel Request procedure
- Signaling Channel Assign procedures
- CM Service Request procedures
- Authentication procedures
- Traffic Channel Assign procedures
- RTP Media procedures
- Release procedures

Mobile Traffic and Web Access Procedures

- Attach procedures
- Identity procedures
- Routing Area procedures
- PDP Context Creation, Activation, Updation, Deactivation, and Deletion procedures
- Web Browsing GPRS Session
- Detach procedures

Traffic Types -

- Voice/SMS calls using regular RTP core (low density)
- High Volume Voice/SMS calls using MAPS™ HD RTP core (high density)
- Supplementary IN Services
- Internet connectivity (HTTP)
- All Industry Standard Codecs

Nodes

MS, BTS, BSC, MSC, HLR, EIR, VLR, SMSC, GMSC, gsmSCF, gsmSSF

Supported Call Scenarios

Voice, SMS

- Real-mobile <-> Real-mobile
- Simulated UE <->Real-mobile
- Simulated UE <->Simulated UE
- Real-mobile <-> Real-Mobile
- Bulk voice traffic simulation using [MAPS™ RTP HD](#)

Web Browsing

- Real-mobile
- Simulated UE
- Bulk mobile traffic simulation using [PacketLoad™](#)

Inter-network Calls and Roaming Calls

- 2G user calling 3G user/4G user
- 3G user calling 2G user/4G user
- 4G user calling 3G user/2G user
- 2G user sending SMS to 3G user
- 3G user sending SMS to 2G user
- 4G user calling 3G user via CSFB
- 2G user calling 3G/4G roaming user
- 3G user calling 2G /4G roaming user
- 4G user calling 3G/2G roaming user

Interfaces

- 2G Interfaces
- Circuit Switched – A-bis, A,
- Packet-switched – Gb, Gn Gp, GI
- MAP Interfaces - C, D, E, F, H
- Inter-network Interfaces – BICC, CAP, INAP
- Location Services - Lg, Lh

2G 2.5G CNL SYSTEM w/ Real BTS

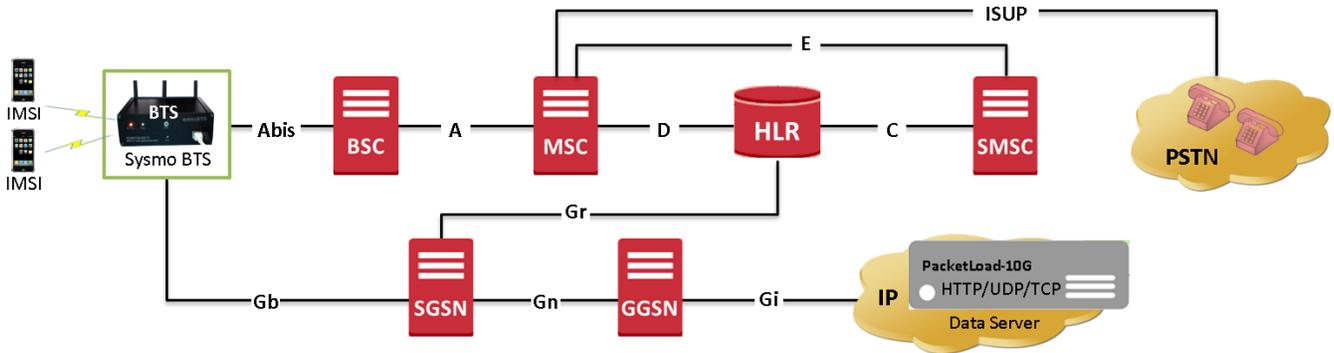


Figure: Complete 2G & 2.5G Network Emulation Test Suite with Real BTS

The above lab setup is realized using the real-time User Equipment (with 2 registered SIMs) and the BTS Node (w/ 3 antennas) to generate the Voice/SMS traffic in CS network and HTTP (Web Access Emulation) traffic generation using real BTS in PS network.

Supported procedures in CS and PS network -

- Mobile-to-Mobile Voice and SMS call
- Mobile Traffic and Web Access procedures

2G and 2.5G CNL SYSTEM w/ Simulated BTS

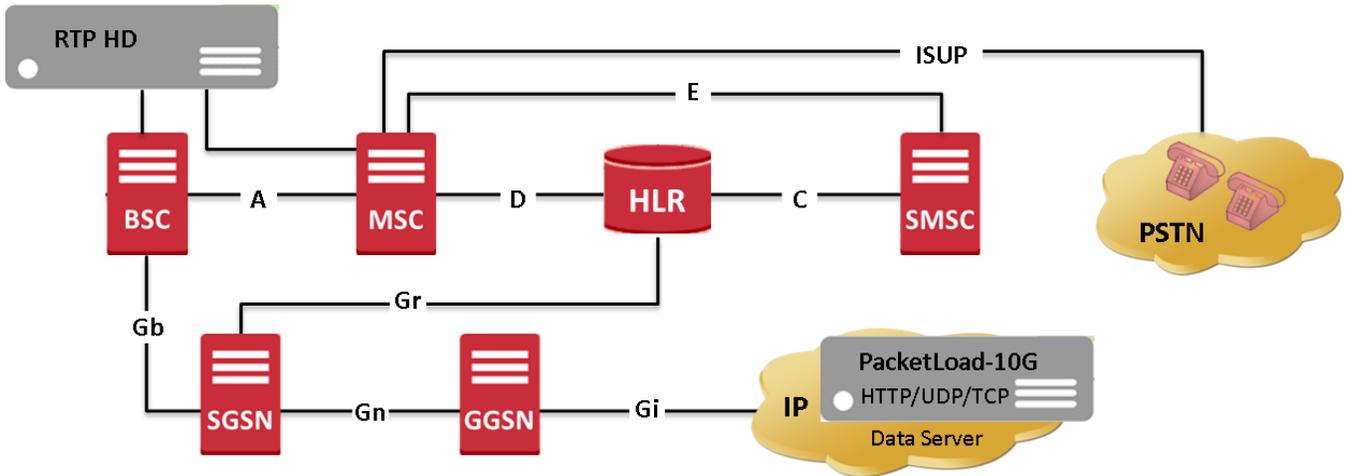


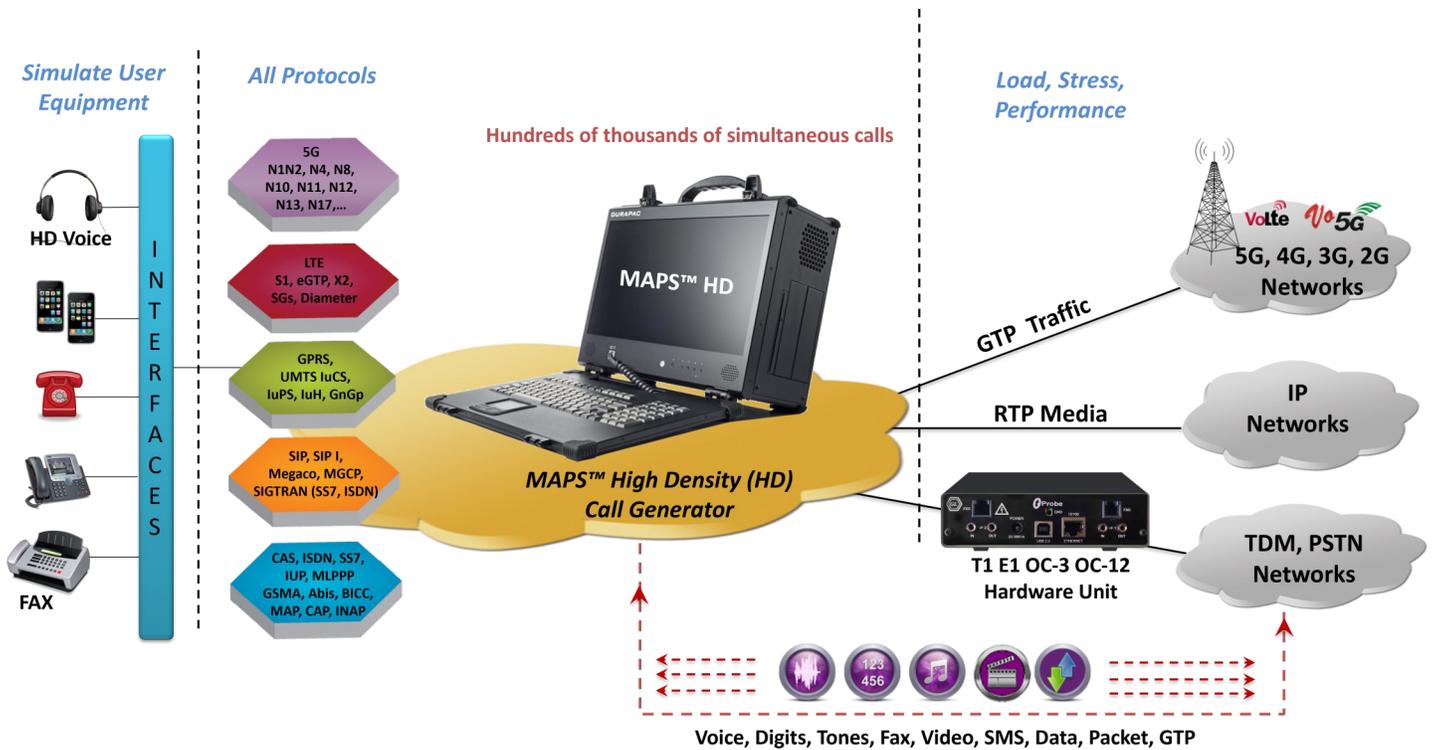
Figure: Complete 2G & 2.5G Network Emulation Test Suite with Simulated BTS

The above lab setup is realized using the MAPS™ application to emulate both the User Equipment and the BTS/BSC Node functionalities generating the Voice/SMS traffic in CS network and HTTP (Web Access Emulation) traffic generation in PS network.

Supported procedures in CS and PS network -

- Mobile-to-Mobile Voice and SMS call
- Mobile Traffic and Web Access procedures

High Density RTP and Mobile Traffic Simulation



GL's [MAPS™ HD](#) is a High Density 1U network appliance that is capable of high call intensity (hundreds of calls/sec) and high volume of sustained calls (tens of thousands of simultaneous calls/1U platform) for a vast array of communication protocols covering IP and Wireless networks. MAPS™ HD network appliance is designed to easily achieve up to 64,000 endpoints per appliance (8000 calls per port). This requires GL's RTP HD traffic generation capability (PKS109) and specialized 1U rack system with integrated HD NIC (w/ 4x 1 GigE).

GL's [MAPS™ Server with PacketLoad](#) appliance supports massive simulation of UEs (up to 100000) with high density (up to 4 Gbps or 40 Gbps) mobile data traffic simulation for LTE networks.

Mobile Traffic Simulation -GPRS Gb:

- Generate and verify user mobile data (Email, Web-HTTP, and FTP), gateway traffic, and packet traffic over (GTPv1 and GTPv2) GPRS Gb network interface

RTP Traffic Simulation:

- Create, manage RTP sessions and generate and receive RTP traffic over the sessions with complete automation capability
- Simulation of RTP Traffic such as Voice, Digits, Tones, IVR and Impairments
- Automate the IVR testing process (call establishment and traffic generation / detection) process through scripts
- Supports all standard Voice codecs

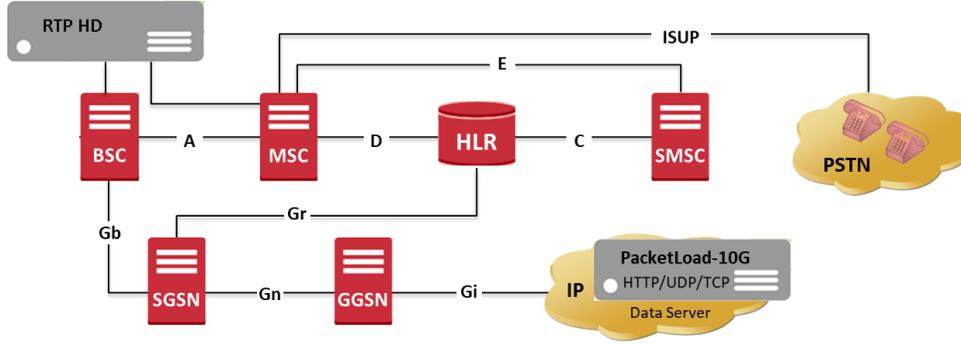
SMS Traffic Simulation:

- Ability to push / pull Short Messages over the network as if sent by thousands of mobile phones (Short Message Mobile Originated (SMS-MO))
- MAPS™ can also transmit a Short Message to a mobile phone (Short Message Mobile Terminated (SMS-MT))

TDM Traffic Simulation:

- Simulation of TDM Traffic such as digits, voice file, single tone, dual tones, Dynamic VF
- Simulation of TDM Fax Traffic
- TRAU GSM traffic over GSM Abis interface
- Create, monitor, and terminate TRAU GSM traffic sessions

Protocol Stack Specification



GTP-u		CM MM RR SMS GCC BCC						CM MM RR SMS		MAP		GTP-u		INAP		BSSAP	
SND CP		BTSM						BSSAP		TCAP		GTP		TCAP			
SM		IPA						SCCP		SCCP		UDP		SCCP			
GMM		SCTP						M3UA		M3UA		MTP3		MTP3			
		IUA						SCTP		SCTP		M2PA		MTP2			
LLC		MAC						IP		IP				MTP1			
BSSGP		GSM Abis over IP						A		SCTP		IP		Phy			
GPRS-NS										C, D, E, Gr		Gn		SS7			
Layer 1-bis																	
GPRS Gb																	

Figure: Protocol Stack Specification

Buyer's Guide

Item No	Product Description
BTS001	Real BTS Mobile Phones SIMs (Optional)
PKS134	MAPS™ GSM Abis IP Emulator
PKS102	RTP Core
PKS172	PacketLoad™ 4 x 1Gig, Data Traffic Generator
PKS174	PacketLoad™ 4 x 10Gig, Data Traffic Generator
PKS132	MAPS™ MAP IP Emulator
PKS166	MAPS™ UMTS Gn Gp Interface Emulation
PKS131	MAPS™ GPRS Gb
ETH101	Mobile Traffic Core-GTP
ETH102	Mobile Traffic Core-Gateway
ETH103	Mobile Traffic Core - GPRS Gb

For more details, refer to [2G GSM GPRS Communications Network Lab](#) webpage.



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