Deployment of Products with Multiple Features & Protocols

Simulates BSSMAP and DTAP Messages

SCTP and TCP Layers

High Volume Calls with Traffic Simulation (up to 20K Calls)

CS Domain RTP Traffic - Digits, Voice File, Tone, Fax, IVR, & VQT

Call Flow Customization with Message & Sequence Editors

Supports Call Control, Mobility Management, & Radio Resource Messages

Mobility Management Procedures - Mobile Originating, Terminating, Location Updating, MO/MT SMSes, and Handover Procedures

Bulk Call Generation using CSV Profiles with up to 20,000 Subscriber Entries

Ratio of Voice and SMS Calls Configuration for CSV Profiles

User Defined Graphs and Statistics Monitoring Signaling and RTP Performance

MAPS™ GSM A over IP
(Scripted GSM A Interface Simulation over IP)

Overview

GL’s MAPS™ GSM A over IP Emulator is an advanced protocol simulator/tester and a traffic generator designed for GSM A interface over IP, which can simulate BSSMAP and DTAP messages and signaling specification as defined by 3GPP standards. The tester supports testing network elements MSC and BSC, error tracking, regression testing, conformance testing, and load testing (call generation). MAPS™ GSM A over IP supports send/receive SMS simultaneously using signaling channel with the voice/data/fax service over a GSM network.

GSM A over IP Interface 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 BSSMAP and DTAP messages and parameters.

With the purchase of RTP Core license (PKS102), MAPS™ GSM AoIP application supports simulation of CS domain RTP traffic such as, digits, voice file, video, tone, fax, and VQT over IP networks. MAPS™ GSM over IP also supports high volume of calls with traffic simulation using MAPS™ HD (High Density) network appliance, which has either four 1 Gbps or two 10 Gbps Ethernet ports.

MAPS™ HD (PKS109) is a network appliance is designed to easily achieve up to 20,000 endpoints per appliance (5000 per port). This high density multi-protocol 1U rack mounted Network Simulation Appliance is available in 2 versions: w/ 4x1GigE.

For more details, refer to https://www.gl.com/maps-gsma-over-ip-emulator.html

Main Features

- Setup a virtual real-time GSM network simulating all the network elements using ‘2G and 2.5G GSM GPRS Communications Network Lab Suite’
- Supports CS domain RTP traffic simulation Digits, Voice File, Tone, Fax, IVR, and Voice Quality.
- Supported codec types includes G.711, G.729, G.726, GSM, AMR, EVRC, SMV, iLBC, SPEEX, G.722, and more. *AMR, EVRC variants requires additional licenses.
- High density of up to 20,000 calls with traffic is easily achievable per appliance (5000 calls per port)
- User-friendly GUI for configuring the SCTP/TCP Layer.
- Supports all Call Control, Mobility Management, Radio Resource Management messages, and SMSes (Short Message Service).
- Access to all BSSMAP and DTAP message parameters like TMSI, IMSI, CIC, MCC, LAC, and more.
- User controlled access to optional parameters such as timers.
- Supports Authentication, TMSI Reallocation, Encryption, and other optional procedures.
- Ready scripts for Mobile Originating, Mobile Terminating, Location Updating procedures, Mobile Originating and Terminating SMSes, and Handover Management procedure.
- Supports bulk call generation using CSV profiles configured with up to 20,000 subscribers entries. CSV profile includes UE parameters such as IMSI, TMSI, MSISDN.
- Testbed option supports to configure the ratio of SMS calls out of Total number of Calls (SMS to call ratio).
- Supports user defined graphs and statistics for monitoring performance of Signaling and RTP traffic.

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Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS™ GSM A over IP and the DUT. It includes parameters for configuring SCTP layer to simulate GSM A messages over SCTP layer.

HD RTP Media Configuration allows to configure GL’s HD Network Interface hardware for generating HD RTP traffic, which has 4x 10G ports.

End user configuration profile used to configure MAPS™ GSM A with supported node parameters.

Option to configure CSV based UE/Subscriber profiles. For massive UE simulation, it is recommended to use CSV option, with which MAPS™ can access the UE related information directly from CSV files.

Pre-processing Tools...

PROFILE EDITOR - The profile editor allows user to edit or create profiles in order to define run-time values to the variables for the message templates. The users can edit the values of the variables thus replacing the original value of the variables in the message template.

An XML file defines a set of multiple profiles with varying parameter values that allow users to configure call instances in call generation and to receive calls.

Users can now enable the traffic option and choose to set either TrafficDigits/ TrafficFile/ TrafficTones/ TrafficFax/ IVR / User-defined traffic types to set and perform over Traffic established call between the nodes.

MESSAGE EDITOR - With message editor, users can build a template for each protocol message type. The value for each field may be changed in the message template prior to testing. The protocol fields comprises of mandatory fixed parameters, mandatory variable parameters, and optional variable parameters.

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Figures: Message Editor, Profile Editor, Testbed setup, Script Editor
Call Generation and Reception

In call generation, MAPSTM is configured for the outgoing messages, while in call receive mode, it is configured to respond to incoming messages. Tests can be configured to run once, multiple iterations and continuously. Also, allows users to create multiple entries using quick configuration feature.

The editor allows to run the added scripts sequentially (order in which the scripts are added in the window) or randomly (any script from the list of added script as per the call flow requirements). The test scripts may be started manually or they can be automatically triggered by incoming messages.

Typical Call Scenario

MAPSTM GSM A over IP can be considered to simulate Call Control, Mobility Management, & Radio Resource Messages. The supported mobility management procedures over GSM A interface includes Location Management Procedure, Mobile Originating and Terminating Procedures, and Handover Management Procedures.

The following call flow depicts the typical Handover Management procedure between old and new BSC via MSC nodes, when a mobile user travels between two areas.

Figure: Handover Management Procedure between old and new BSC

The following call flow depicts the typical Mobile Originating procedure between BSC and MSC nodes in GSM A interface.

Figure: Mobile Originating Procedure between BSC and MSC
The following call flow depicts the typical Mobile Terminating procedure between MSC and BSC nodes in GSM A interface.

![Mobile Terminating Call Procedure](image)

Short Message Service (SMS) is a mechanism of short messages delivery over the mobile networks. It is a store and forward way of transmitting messages to and from mobile phones. The messages (text only) from the sending mobile is stored in a central short message center (SMC) which then is forwarded to the destination mobile.

The following call flow depicts the typical SMS call procedure between MSC and BSC nodes in GSM A interface.

![Location Updating Call Procedure](image)

![SMS Call Procedure](image)

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Supported Protocol Standards

<table>
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<th>Supported Protocols</th>
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<td>SCCP</td>
<td>Q.713, CCITT (ITU-T) Blue Book</td>
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<td>M3UA</td>
<td>RFC 3332</td>
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<td>BSSMAP/DTAP</td>
<td>3GPP TS 08.08 V8.9.0, 3GPP TS 48.008 V10.0.0 (2011-01)</td>
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<td>3GPP TS 04.11 V7.1.0 GSM 03.38 version 7.2.0 Release 1998</td>
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Buyer's Guide

PKS137 - MAPS™ GSM A over IP (GSM A Emulation over IP)
PKS109 - MAPS™ RTP HD Traffic Option
PKS102 - RTP Traffic Option
PCD103 - AMR codec for MAPS™
PCD104 - EVRC codec for MAPS™
PCD105 - EVR_B codec for MAPS™
PCD106 - EVR_C codec for MAPS™

Related Software

XX692 – MAPS™ GSM A Interface Emulator
XX648 – MAPS™ ISDN
XX693 – MAPS™ GSM A bis
PKS130 – MAPS™ SIGTRAN (SS7 over IP)
XX120 – SS7 Analysis Software
PKS140 – MAPS™ LTE - S1 Interface
PKS142 – MAPS™ LTE - eGTP (S3, S4, S5, S8, S10, S11 and S16) Interfaces
PKV107 – LTE Protocol Analyzer
XX165 – T1 or E1 UMTS Protocol Analyzer
LTS206 – OC-3 / STM-1 UMTS Protocol Analysis
LTS306 – OC-12 / STM-4 UMTS Protocol Analysis

Related Software...

PKS164 - MAPS™ UMTS – Iu-PS Interface Emulation
PKS160 - MAPS™ UMTS – Iu-CS and Iuh Interface Emulation
PKS166 - MAPS™ UMTS – Gn Interface Emulation
PKS135 - MAPS™ ISDN SIGTRAN (ISDN over IP)
XX100 - ISDN Analyzer Software
PKS120 - MAPS™ SIP
PKS121 - MAPS™ SIP Conformance Test Suite (Test Scripts)
PKS122 - MAPS™ MEGACO
PKS123 - MAPS™ MEGACO Conformance Test Suite (Test Scripts)
PKS124 - MAPS™ MGCP & Conformance Test Suite
PKS126 - MAPS™ SIP-I
PKV120 - PacketScan™ HD w/4 x 1GigE
PKV122 - PacketScan™ HD w/2 x 10GigE

For complete list of MAPS™ products, refer to https://www.gl.com/maps.html webpage.