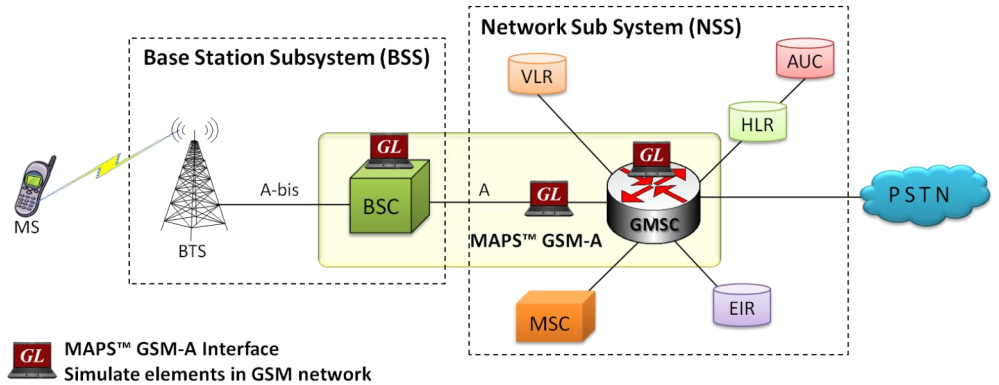


Message Automation & Protocol Simulation (MAPS™)

MAPS™ GSM - A Interface Emulator



Overview

GL's Message Automation & Protocol Simulation (MAPS™) is a powerful Protocol Test platform supporting a wide range of protocols such as GSM over A interface, A-bis interface, SS7, ISDN, MGCP, and many others.

GL's GSM A Interface Emulator is an advanced protocol simulator/tester for GSM simulation over A Interface that 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, load testing/call generation and generation of high volumes of GSM traffic. It is able to run pre-defined test scenarios against GSMA interface test objects in a controlled & deterministic manner.

GSM A 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.

This test tool can also be used to perform protocol conformance testing as per the following specifications -

- 3GPP TS 24.008
- 3GPP TS 08.08
- 3GPP TS 04.11
- 3GPP TS 04.18
- 3GPP TS 03.40

For more details, refer to <http://www.gl.com/maps-gsma.html>

Main Features

- GSM A Interface simulation over TDM (E1/T1)
- Supports transmission and detection of TDM traffic - digits, voice file, single /dual tones
- MAPS™ can be configured to act as either BSC or MSC
- User-friendly GUI for configuring the MTP Layers
- User Configurable Signaling Links
- Supports all Call Control, Mobility Management, and Radio Resource messages
- Access to all BSSMAP and DTAP Message Parameters like CM Service Request, Paging, Call Control messages, Release messages, 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, and Location Updating procedures



GL Communications Inc.

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

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

Deployment of Products with Multiple Features & Protocols

Simulates BSSMAP and DTAP Messages

Call Flow Customization with Message & Sequence Editors

Supports Call Control, Mobility Management, & Radio Resource Messages

Graphically Depicts Call Flows in Ladder Diagrams

Provides Fault Insertion, & Erroneous Call Flow Testing

High Volume Traffic Options

Multiple T1/E1 Interfaces

Ready Scripts for Simpler & Less Time Consuming Tests

Working Principle

- **Message Templates** – Forms the backbone of MAPS™ application that contains various protocol fields with default values.
- **Script Editor** –
 - Creates a script for scenario based testing (call flow)
 - Uses pre-defined message templates in the script
 - Access protocol fields as variables using import/export files
- **Message Editor** – Used to edit / create 'Message Templates'.
- **Profile Editor** – Creates or edit profiles containing values assigned to the variables replacing the original values.
- **Event Profile Editor** – Allows you to create Event Profiles for user-defined events in a script. The values of the variables in the user-events can be changed during script execution.

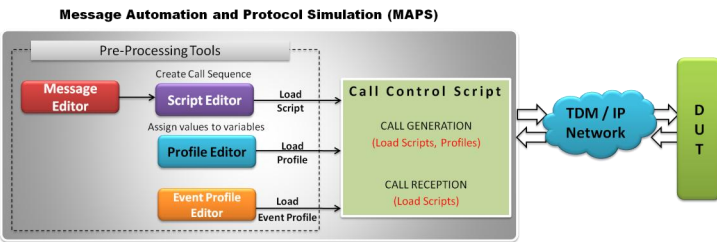


Figure: MAPS™ application Working Principle

Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS™-GSM A and the DUT. It includes parameters for configuring T1/E1 (GL) server, MTP Task and MTP signaling to transmit and receive GSM A messages over MTP layer.

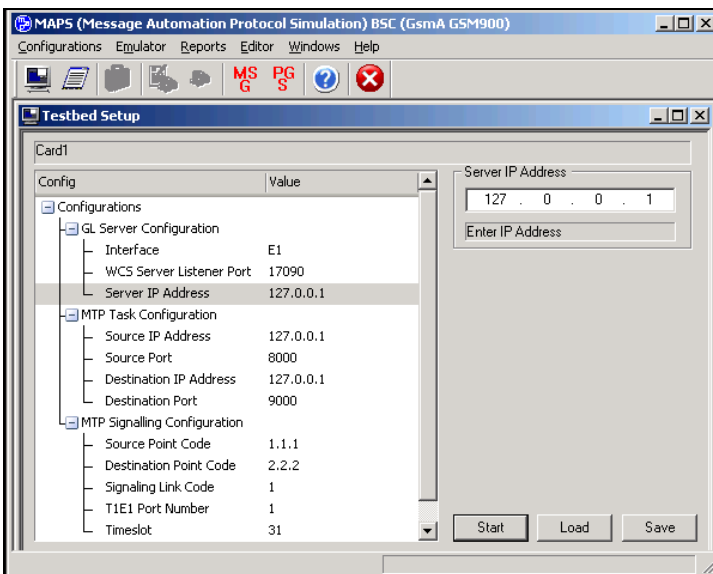


Figure: Testbed Setup

Pre-processing Tools

Script Editor

The script editor allows the user to create / edit scripts and access protocol fields as variables for the message template parameters. The script uses pre-defined message templates to perform send and receive actions.

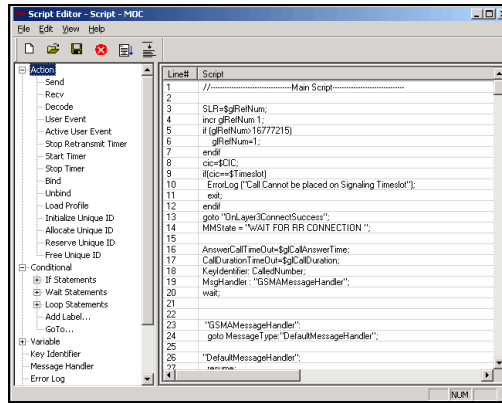


Figure: Script Editor

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.

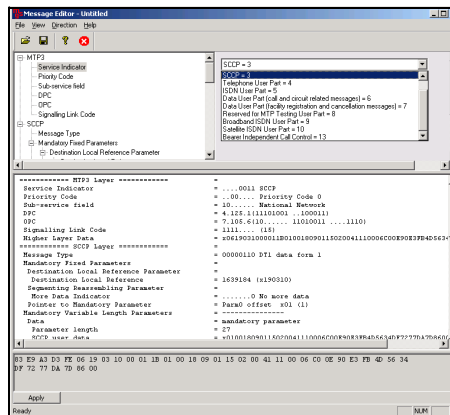


Figure: Message Editor

Profile Editor - This feature allows loading profile to edit the values of the variables using GUI, replacing the original value of the variables in the message template.

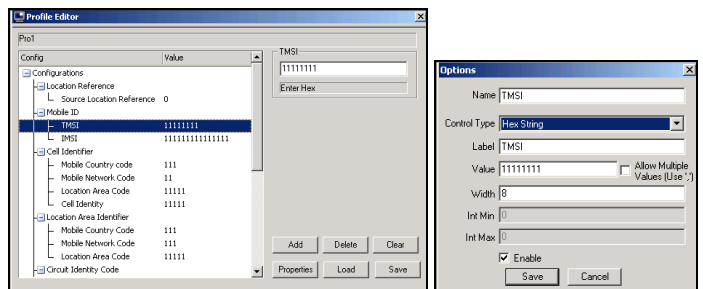


Figure: Profile Editor



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com

Call Generation and Reception

In call generation, MAPS™ is configured for the out going 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.

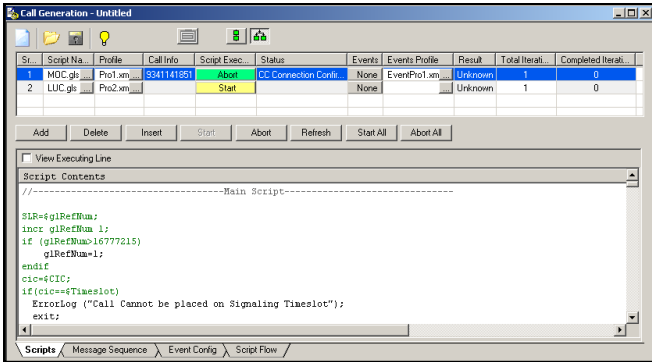


Figure: Call Generation

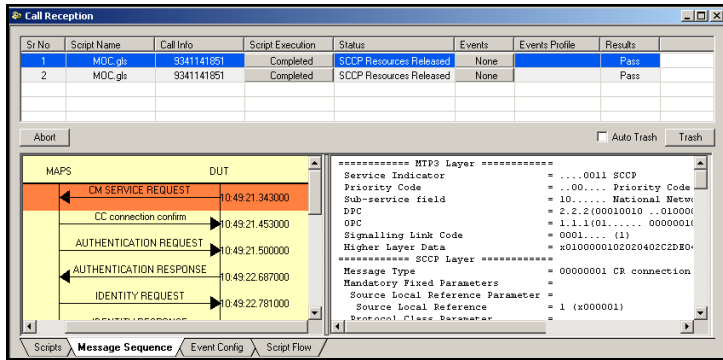


Figure: Call Reception

Incoming Call Handler Configuration

The script configuration option is used to preset the script required to handle all possible GSM A signaling and call control messages against particular message expected to arrive.

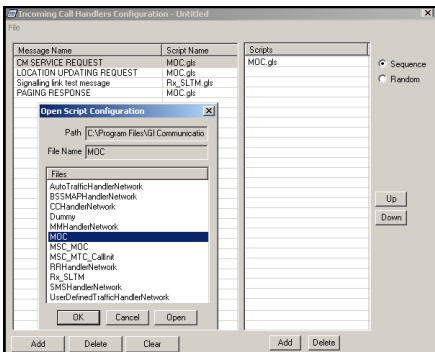


Figure: Incoming Call Handler

MAPS™ GSM A Call Flow Scenarios

Scenario 1: MAPS™-GSM A as BSC, initiating Mobile Originating Call (MOC)

The MAPS™-GSM A is considered to act as Base Station Controller (BSC) and initiating the call flow by sending CM Service Request to the Network (MSC).

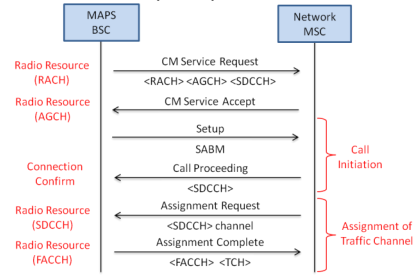


Figure: MAPS™-GSM A acting as BSC

Sample Place Call Script

```
send "CMServiceRequest" "CMServiceRequestImport";
decode "AuthenticationRequestExport";
send "AuthenticationResponse" "AuthenticationResponseImport";
decode "IdentityRequestExport";
send "IdentityResponse" "IdentityResponseImport";
decode "CipherModeCommandExport";
send "CipherModeComplete" "CipherModeCompleteImport";
decode "TMSIReallocationCommandExport";
send "TMSIReallocationComplete" "TMSIReallocationCompleteImport";
decode "CMServiceAcceptExport";
send "Setup" "SetupImport";
```

Scenario 2: MAPS™-GSM A acting as MSC, receiving calls

MAPS™-GSM A is considered as MSC processing the call flow by receiving the MOC message from the BSC.

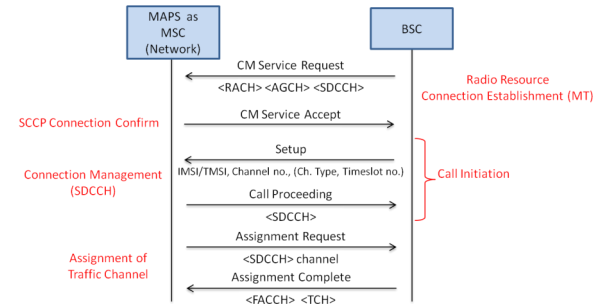


Figure: MAPS™-GSM A acting as MSC

Sample Answer Call Script

```
decode "CMServiceRequestExport";
send "AuthenticationRequest" "AuthenticationRequestImport";
decode "AuthenticationResponseExport";
send "IdentityRequest" "IdentityRequestImport";
decode "IdentityResponseExport";
send "TMSIReallocationCommand" "TMSIReallocationCommandImport";
decode "TMSIReallocationResponseExport";
send "CMServiceAccept" "CMServiceAcceptImport";
decode "SetupExport";
send "CallProceeding" "CallProceedingImport";
```



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com

Supported Protocol Standards

Available Standards	Supported Protocols	Standard / Specification Used
GSM A 900	SCCP	Q.713, CCITT (ITU-T) Blue Book
	MTP3	Q.703, ITU-T Blue Book
	BSSMAP/DTAP	3GPP TS 08.08 V8.9.0
	MM / CC	3GPP TS 04.08 V7.17.0
	RR	3GPP TS 04.18 V8.13.0
	SMS	3GPP TS 03.40 V7.5.0 & 3GPP TS 04.11 V7.1.0 GSM 03.38 version 7.2.0 Release 1998

Buyer's Guide

[XX692](#) – MAPS™ GSM-A Interface Emulator

[XX600](#) – Basic Client/Server Scripted Control Software

[xx600](#), [xx610](#), [xx620](#)—TDM Traffic Options

Related Software

[XX648](#) – MAPS™ ISDN

[XX693](#) – MAPS™ GSM-Abis

[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

[PKS164](#) - MAPS™ UMTS - IuPS Interface Emulation

[PKS160](#) - MAPS™ UMTS - IuCS and Iuh Interface Emulation

[XX165](#) - T1 or E1 UMTS Protocol Analyzer

[OLV165](#) - Offline UMTS Protocol Analyzer

[LTS206](#) - OC-3 / STM-1 UMTS Protocol Analysis

[LTS306](#) - OC-12 / STM-4 UMTS Protocol Analysis

[PKS135](#) - MAPS™ ISDN-SIGTRAN (ISDN over IP)

[XX100](#) - ISDN Analyzer Software

Related 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

[PKS125](#) - MAPS™ MGCP Conformance Test Suite (Test Scripts)

Related Hardware

[HTE001](#) - Universal HD T1 or E1 PCI Cards

[UTE001](#) - USB based Dual T1 or E1 Laptop Analyzer

[PTE001](#) - tProbe™ T1 E1 Base Unit

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



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
(Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com