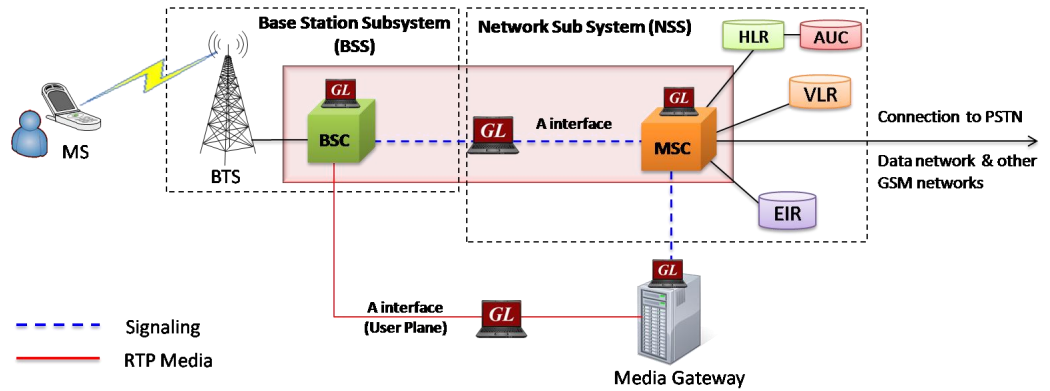


MAPS™ GSM A over IP (Simulate GSM A Interface over IP)



GL MAPS™ GSM A over IP
Simulate elements in GSM A network over IP

Overview

GL's Message Automation & Protocol Simulation (MAPS™) is a powerful Protocol Test platform supporting a wide range of protocols such as GSM A over IP, GSM Abis, SS7, ISDN, MAP Interface, LTE, UMTS, Gn and Gp Interfaces, SIP-I, SIGTRAN (SS7 over IP), ISDN SIGTRAN (ISDN over IP), SIP, MEGACO, MGCP, and many others.

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. It can run pre-defined test scenarios against GSM A over IP interface test objects in a controlled & deterministic manner.

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.

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

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

Main Features

- GSM A simulation over IP
- GSM A over IP Emulator can be configured to act as either BSC or MSC
- Supports RTP traffic generation and reception (requires additional license)
- User-friendly GUI for configuring the SCTP Layer
- User configurable signaling links
- 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, and Mobile Originating and Terminating SMSes

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



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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.

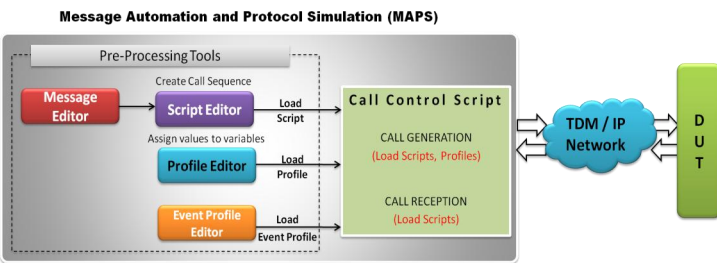


Figure: MAPS™ application Working Principle

Testbed Setup Configuration

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

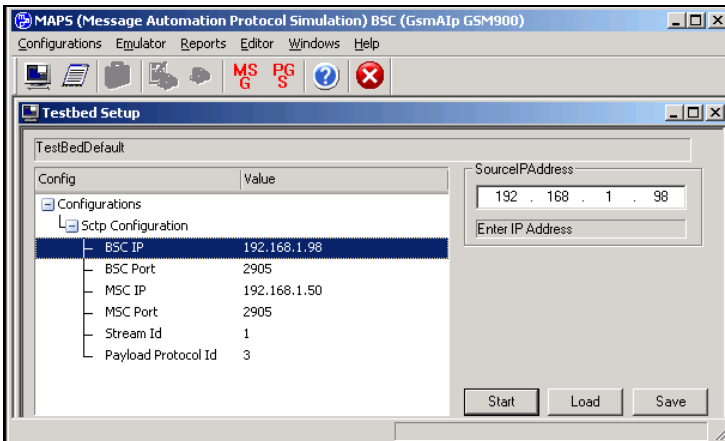


Figure: Testbed Setup

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.

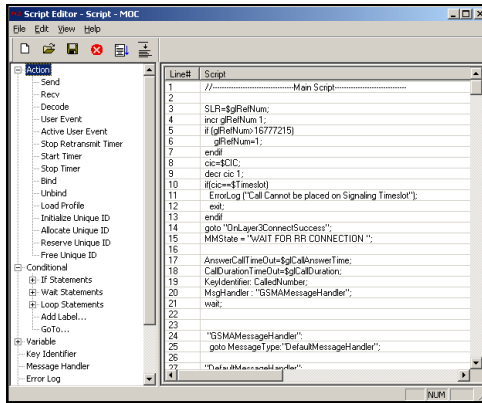


Figure: Script Editor

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.

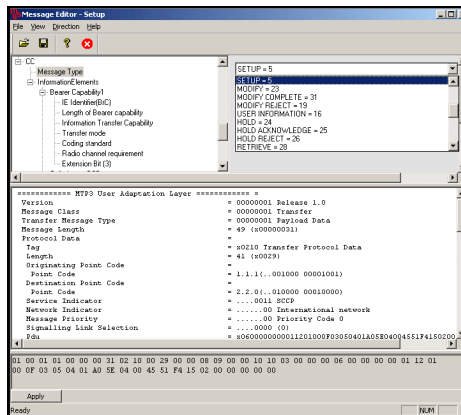


Figure: Message Editor

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.

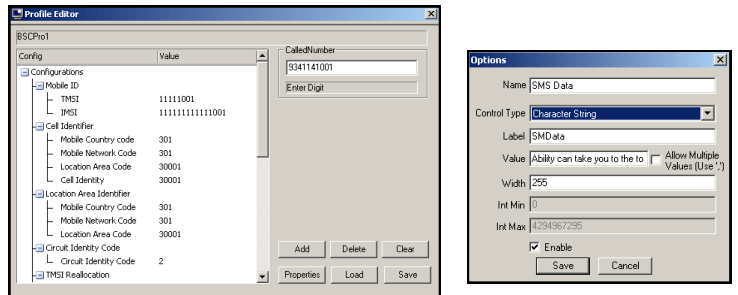


Figure: Profile Editor



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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.

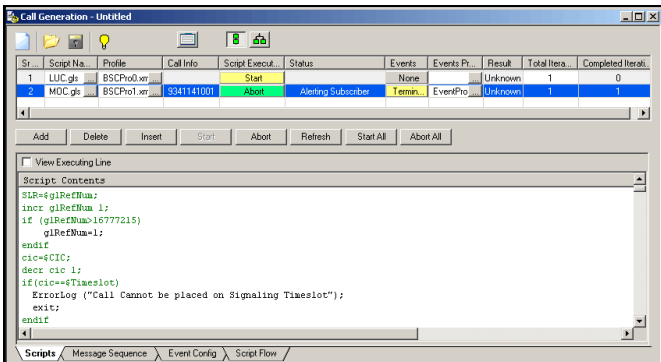


Figure: Call Generation

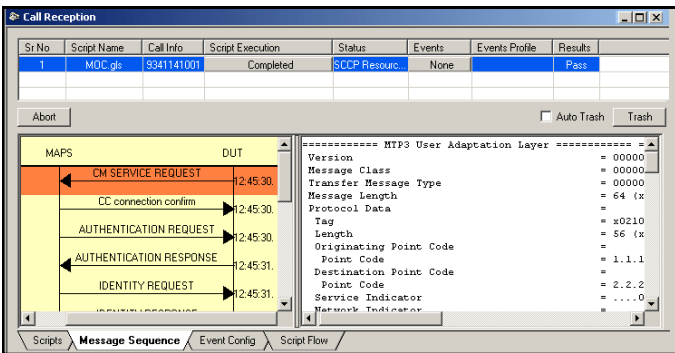


Figure: Call Reception

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.

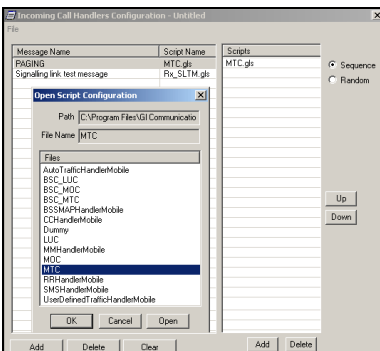


Figure: Incoming Call Handler

MAPS™ GSM A over IP Call Flow Scenarios

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

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

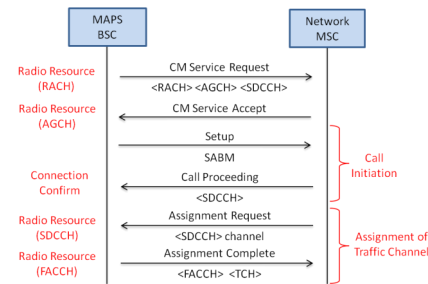


Figure: MAPS™ GSM A over IP acting as BSC

Sample Place Call Script

```

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

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

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

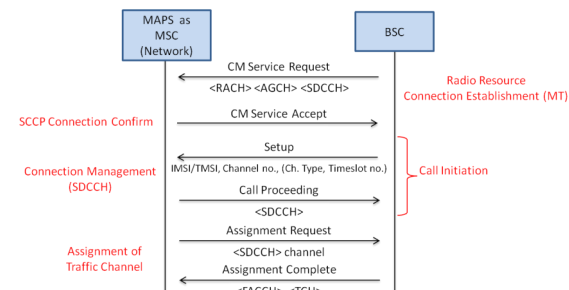


Figure: MAPS™ GSM A over IP acting as MSC

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" ;
    
```



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Supported Protocol Standards

Available Standards	Supported Protocols	Standard / Specification Used
GSM A over IP 3GPP TR 43.903 V9.0.0 (2009-12)	SCCP	Q.713, CCITT (ITU-T) Blue Book
	SCTP	RFC 4960
	M3UA	RFC 3332
	BSSMAP/DTAP	3GPP TS 08.08 V8.9.0, 3GPP TS 48.008 V10.0.0 (2011-01)
	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

[PKS137](#) - MAPS™ GSM A over IP (GSM A Emulation over IP)

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

PKS102 - RTP Traffic Options

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

[PKS164](#) - MAPS™ UMTS – Iu-PS Interface Emulation

[PKS160](#) - MAPS™ UMTS – Iu-CS 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

Related Software...

[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

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

[PKS126](#) - MAPS™ SIP-I

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.



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