

Simulates MAP Signaling over SS7 Protocol Stack



Supporting Interfaces are C, D, E, F, Gc, Gd, Gf, Gr, and H



Analysis and Simulation Capability on par with any Protocol Tester in the Market



Bulk Call Simulation, Load/Stress Testing



Supports Interface Dependent Messages such as Mobile Originating, Location Update, Retrieval Routing



Call Flow Customization with Message & Sequence Editors



Graphically Depicts Call Flows in Ladder Diagrams



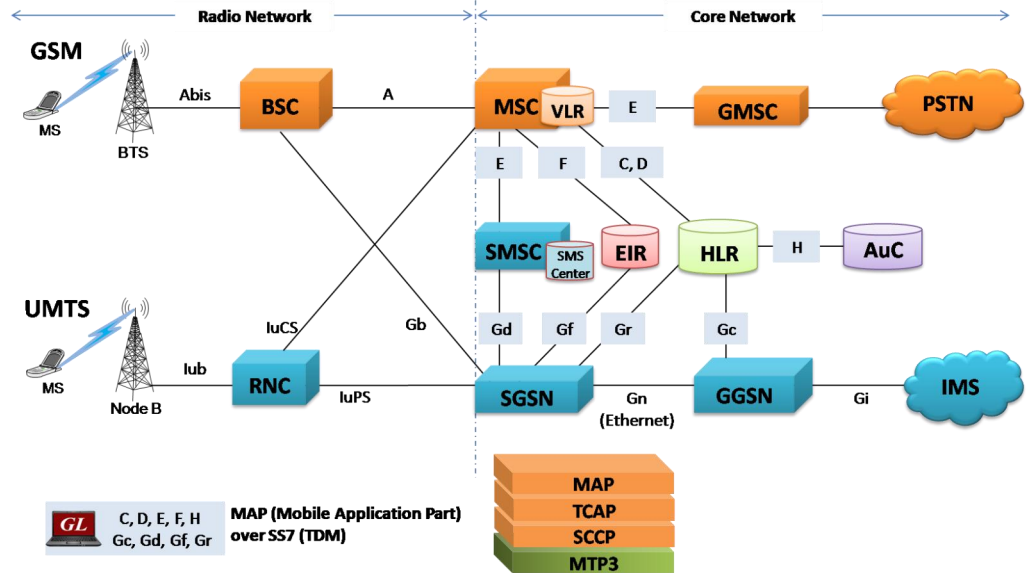
Provides Fault Insertion, & Erroneous Call Flow Testing



Ready Scripts for Simpler & Less Time Consuming Tests



## MAPS™ MAP Protocol Emulator (Scripted Mobile Application Part Protocol Emulator)



### Overview

The **Mobile Application Part (MAP)** is an SS7 protocol which provides application layer services to the various nodes in GSM and UMTS networks. MAP can be transported using 'traditional' SS7 protocols carried by Message Transfer Protocol (MTP) in TDM (T1 and E1) or over IP using SIGTRAN. As illustrated in the network diagram, some of the GSM/UMTS circuit switched interfaces such as C, D, E, F, Gc, Gr, Gf, Gd use Mobile Application Part (MAP) protocol. The "radio" and "core" network partition is also shown above for GSM and UMTS networks. Common services provided by MAP over IP are "location tracking", "roaming", "subscription information", "short message service", and many more.

GL's **MAPS™ (Message Automation and Protocol Simulation)** is an advanced and versatile protocol simulator/tester that can simulate a variety of protocols encountered in the telecom space, including SIP, GSM, UMTS, Megaco, ISDN, CAS, SS7, and many more.

Now, **MAPS™ MAP** product line bearing the same acronym, is used to emulate all the GSM and UMTS MAP interfaces listed above over T1 or E1. Additional features includes error tracking, regression testing, conformance testing, load testing and call generation. It can run pre-defined test scenarios against test objects in a controlled & deterministic manner.

For more details refer to <http://www.gl.com/maps-map-emulator.html> webpage.

### Main Features

- MAP protocol simulation over TDM (E1/T1).
- Emulator can be configured as MSC (VLR), HLR, GMSC, EIR, AuC, SMSC, SGSN and GGSN entities and emulate the respective interfaces.
- User-friendly GUI for configuring the MAP signaling links.
- Access to all MTP3, SCCP, and MAP R4 protocol fields such as TMSI, IMSI, MCC, MNC, MSIN, CCBS and more.
- Ready scripts for monitoring other end, set reporting state for the requested service, report an event or call outcome, report remote subscriber status procedures.
- Logging of all messages in real-time.
- Save and load configurations.
- Supported on Windows® XP (or higher) operating systems.



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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 value in the profiles can be changed during script execution.

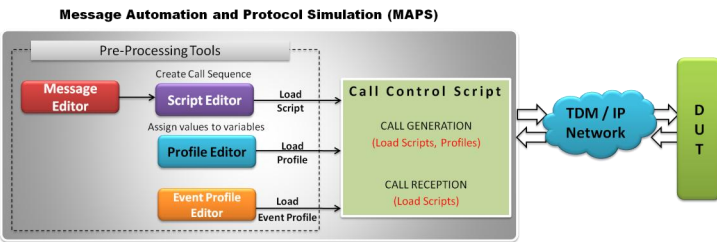


Figure: MAPS™ application Working Principle

## 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.

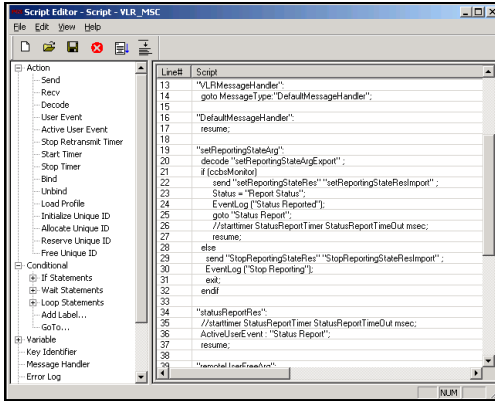


Figure: Script Editor

**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.

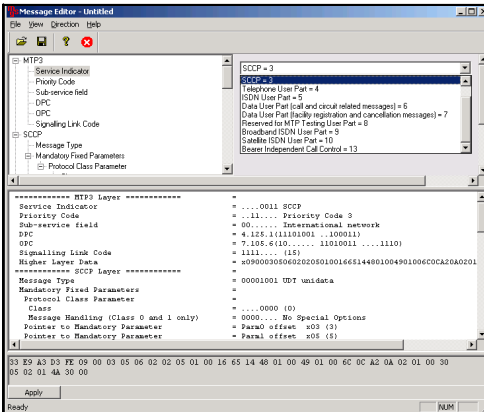


Figure: Message Editor

## Testbed Setup Configuration

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

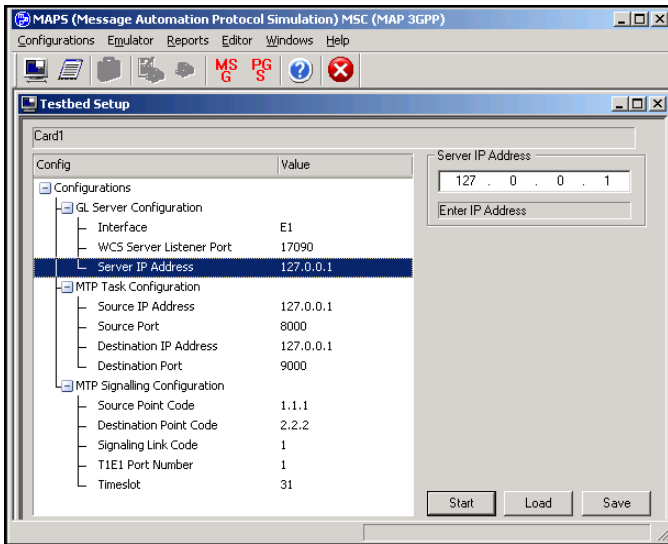


Figure: Testbed Setup

**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.

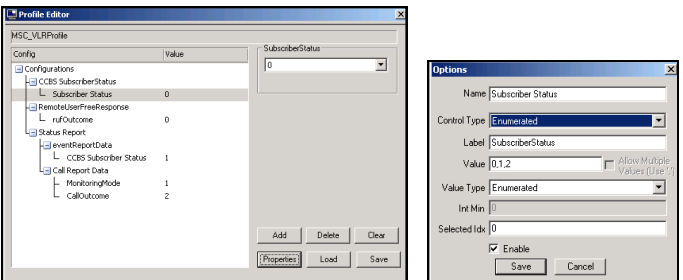


Figure: Profile Editor



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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.

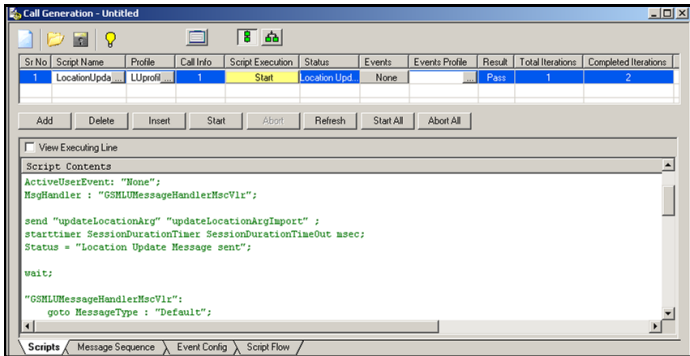


Figure: Call Generation

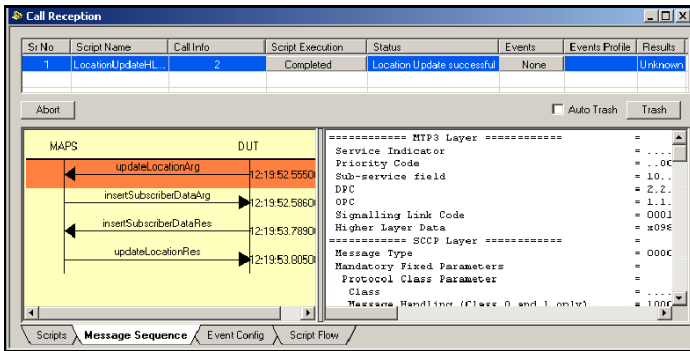


Figure: Call Reception

### Auto Incoming Call Handler Configuration

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

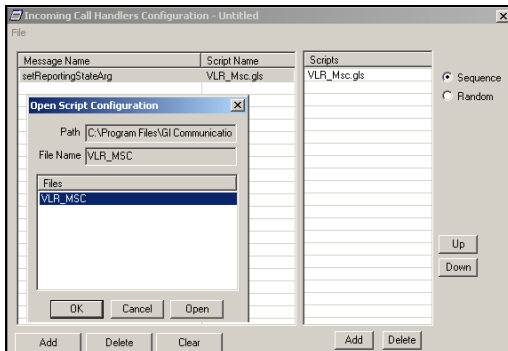


Figure: Incoming Call Handler

### Typical Call Flow Scenarios

Shown below are the various call flow scenarios where MAPS™ MAP can be configured as entities to send and receive messages.

Supporting elements and interfaces that comprise the core network are MSC, HLR, EIR, SMSC, GMSC, SGSN, GGSN, AuC, and C, D, E, F, H, Gc, Gd, Gf, Gr.

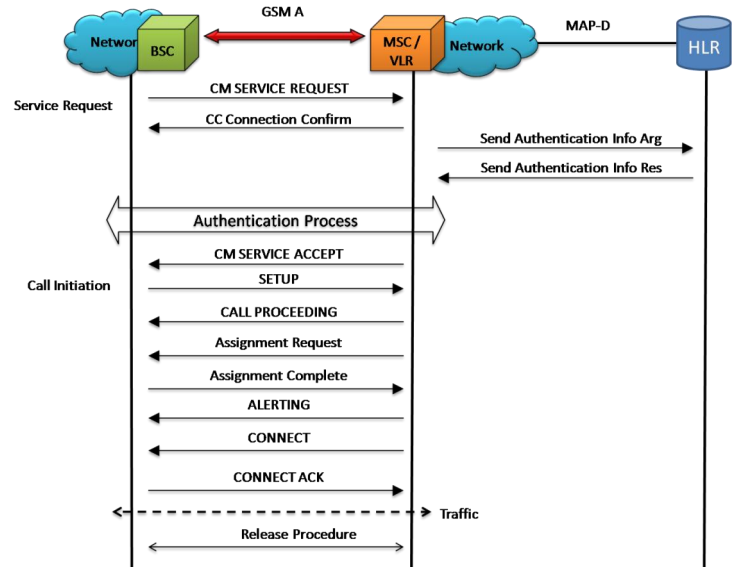


Figure: MAP/D Mobile Originating Call Flow

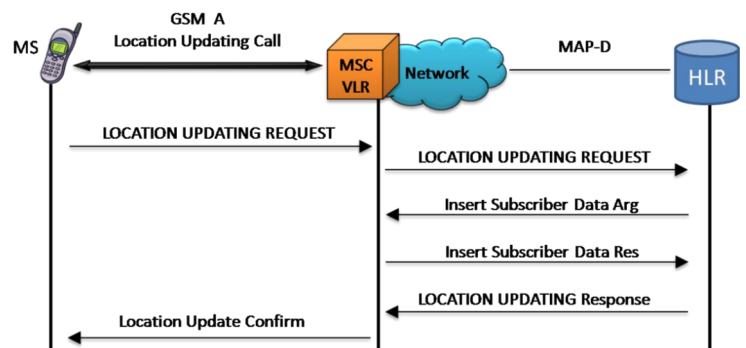


Figure: MAP/D Location Update Call Flow

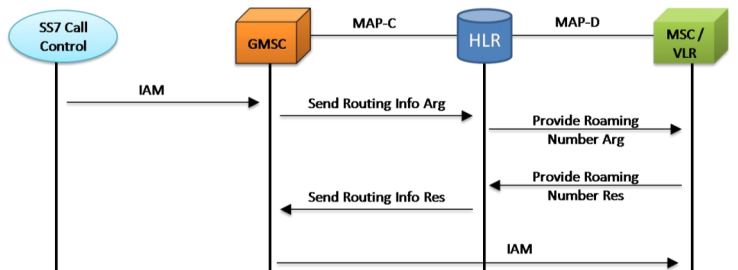


Figure: Retrieval Routing Information Call Flow



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## Supported Protocol Standards

Available Standards	Supported Protocols	Standard / Specification Used
MAP	MAPR4	3GPP TS 29.002 V4.18.0 (2007-09)
	TCAP	ANSI T1.114-1996
	SCCP	Q.713, CCITT (ITU-T) Blue Book
	MTP3	Q.703, ITU-T Blue Book

### Buyer's Guide

[XX649](#) - MAPS™ SS7 Protocol Emulation, includes MAP Protocol Emulation over TDM

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

### Related Software

[XX120](#) - SS7 Analysis Software

[PKS130](#) - MAPS™ SIGTRAN (SS7 over IP), includes MAP Emulation over IP

[XX648](#) – MAPS™ ISDN Interface Emulator

[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

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

[XX100](#) - ISDN Analyzer Software

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

[XX693](#) – MAPS™ GSM -Abis Interface Emulator

### Related Software...

[XX651](#) - MAPS™ CAS Emulator

[XX652](#) - MAPS™ MC-MLPPP Conformance Test Suite (Test Scripts)

[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

[FTE001](#) - QuadXpress T1 E1 Main Board (Quad Port– requires additional licenses)

[ETE001](#) - OctalXpress T1 E1 Main Board plus Daughter Board (Octal Port– requires additional licenses)

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



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