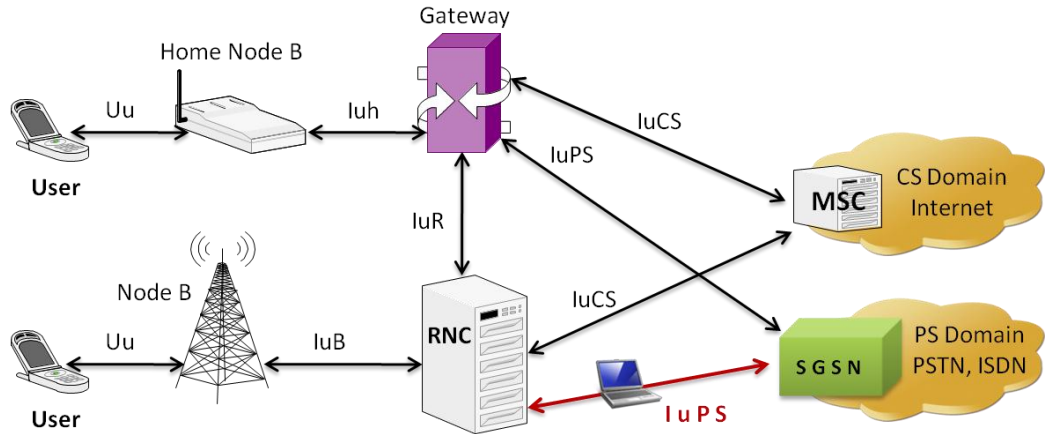


MAPS™ - UMTS Iu-PS Interface (Universal Mobile Telecommunications System)



 **MAPS™ - UMTS IuPS**

Overview

A mobile network consists of radio access and a core network. UMTS is a specific set of 3G standards evolved from Global Systems for Mobile communications (GSM) that covers the entire mobile system – radio access and the core network. The UMTS delivers high-bandwidth data and voice services to mobile users. IP and ATM are the most preferred transport network layer protocol used in the UMTS. IP based UMTS supports integrated services such as multimedia and global roaming to mobile users.

GL's Message Automation & Protocol Simulation™ (MAPS™) designed for UMTS - IuPS interface can simulate RNC (Radio Network Controller), and 3G SGSN (3G Serving GPRS Support Node). Iu-PS Interface (Packet Switched) links RNC (Radio Network Controller) with a 3G SGSN (3G Serving GPRS Support Node). GL's MAPS™ UMTS - IuPS uses IP as transport layer (over SCTP).

The MAPS™ - UMTS test tool is designed with specific test cases, as per UMTS 3GPP standards over IP (as Transport layer). Test cases include general messaging and call flow scenarios for enhanced mobile radio and internet access. Logging and pass/fail results are also reported. Test cases verify actions such as signaling registration, and other related call procedures.

The application gives the users the unlimited ability to edit RANAP messages and call control scenarios (message sequences). "Message sequences" are generated through scripts. "Messages" are created using message templates.

For more information on MAPS™ - UMTS, refer to <http://www.gl.com/maps-umts-iups-emulator.html>.

Main Features

- Simulates RNC, and SGSN.
- Provides fault insertion, and erroneous call flows testing capability.
- Supports all Mobility Management, Session Management, RANAP messages.
- Ready scripts for Mobile Originating, Mobile Terminating, Location Updating, GPRS Attach, and Detach procedures for quick testing.
- Supports RTP traffic generation and reception (requires additional license)
- Impairments can be applied to messages to simulate error conditions
- Supports customization of call flows and message templates using Script and Message editor.
- Supports scripted call generation and automated call reception.

UMTS IuPS Interface
Simulation over IP

Test Cases as per UMTS 3GPP
Mobile Standards

Provides Enhanced Mobile
Radio and Internet Access

Supports RANAP Signaling
Messages

Scripted Call Generation and
Automated Call Reception

Customization of Call Flow
with Message & Sequence
Editors

Provides Fault Insertion, &
Erroneous Call Flow Testing

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



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

Working Principle

- **Message Editor** - Used to edit / create Message Templates
- **Message Templates** - Backbone of MAPS™ application that contains various protocol fields with default values
- **Script Editor** -
 - Creates a script for scenario based testing (call flow) with DUT
 - Uses pre-defined message templates in the script
 - Access protocol fields as variables using import/export files
- **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.

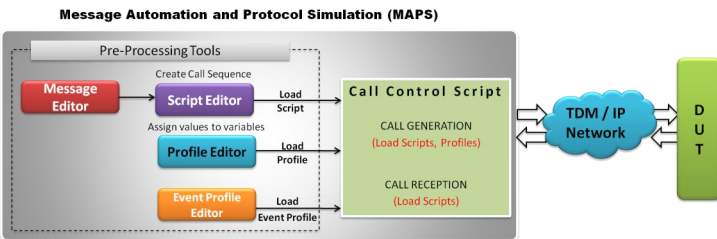


Figure: MAPS™ application Working Principle

Testbed Configuration

The configuration window allows users to setup the required test environment with SCTP and MTP configurations in UMTS IuPS interface.

SCTP Configuration - consists of Source, and Destination/ Device under Test (DUT) IP address and port configuration parameters used to configure MAPS™ to simulate RNC and SGSN in UMTS IuPS interface. MAPS™ is configured to generate and receive RANAP messages to/from valid IP Address in the UMTS network.

MTP Configuration - consists of Source, and Destination Point Code (SPC & DPC). The SPC identifies the node from which the messages are originated, and DPC identifies the destination node to route the messages.

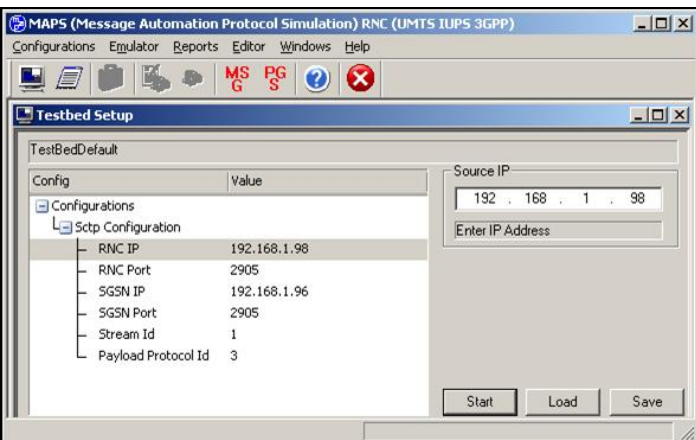


Figure: Testbed Setup

Pre-processing Tools

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.

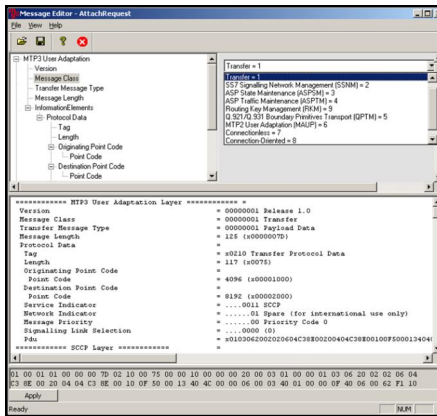


Figure: Message Editor

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.

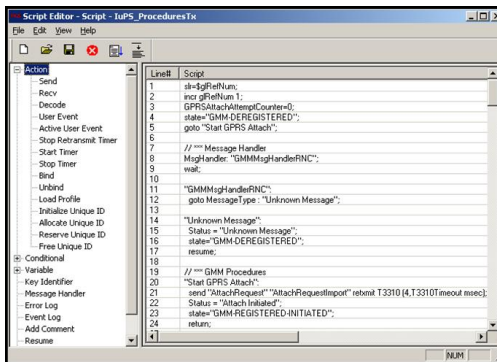


Figure: Script Editor

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.

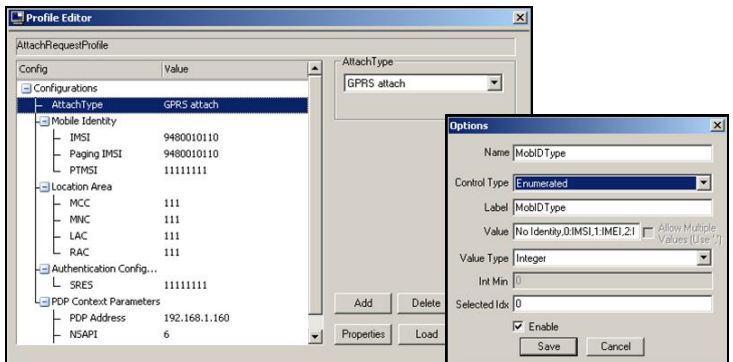


Figure: Profile Editor

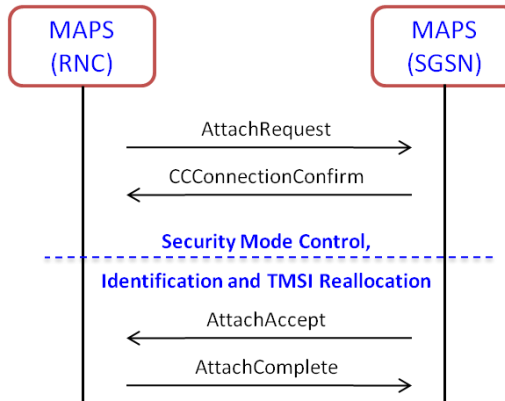


818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com

MAPS™ - UMTS IuPS Signaling Flow

Scenario 1: MAPS™-UMTS IuPS acting as RNC and testing DUT (SGSN)

MAPS™-UMTS IuPS is considered as Caller (User End) and initiates the call flow by sending AttachRequest to the DUT.



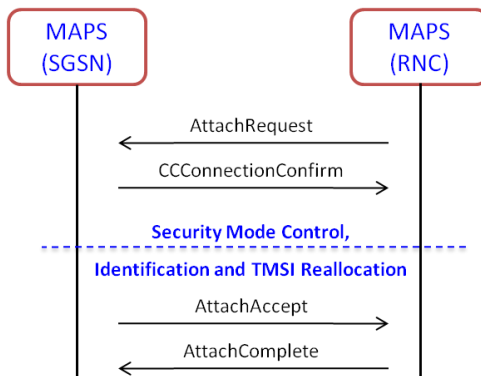
Sample Place Call Script

```

send "AttachRequest" "AttachRequestImport";
decode "AuthenticationRequestExport";
send "AuthenticationResponse" "AuthenticationResponseImport";
decode "SecurityModeCommandExport";
send "SecurityModeComplete" "SecurityModeCompleteImport";
decode "AttachAcceptExport";
send "AttachComplete" "AttachCompleteImport";
    
```

Scenario 2: MAPS™-UMTS IuPS resides at the network (SGSN) testing DUT (RNC)

MAPS™ -UMTS IuPS is considered as the DUT (RNC) processing the call flow by receiving the AttachRequest from the caller (SGSN).



Sample Answer Call Script

```

decode "AttachRequestExport";
send "AuthenticationRequest" "AuthenticationRequestImport";
decode "AuthenticationResponseExport";
send "SecurityModeCommand" "SecurityModeCommandImport";
decode "SecurityModeCompleteExport";
send "AttachAccept" "AttachAcceptImport";
decode "AttachCompleteExport";
    
```

Call Generation and Call 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.

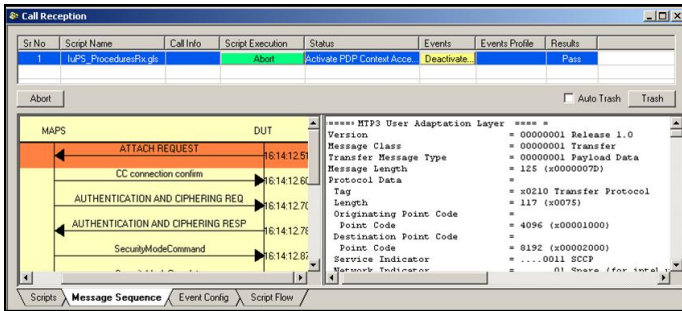
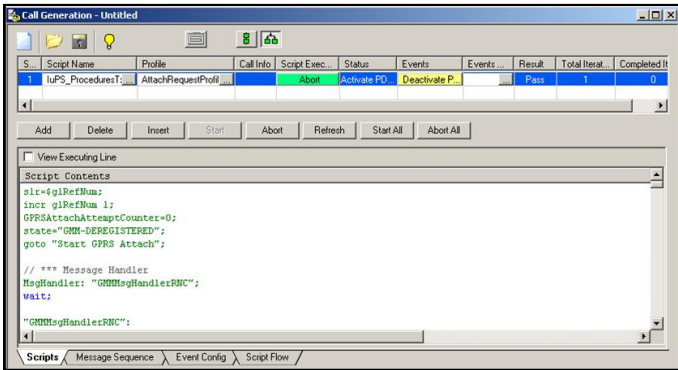


Figure: MAPS™ - IuPS Call Generation and Reception

Incoming Call Handler Configuration

This option to preset the script required to handle all possible signaling and call processing messages for responding to the call requests in Call Receive part of the MAPS™-IuPS.

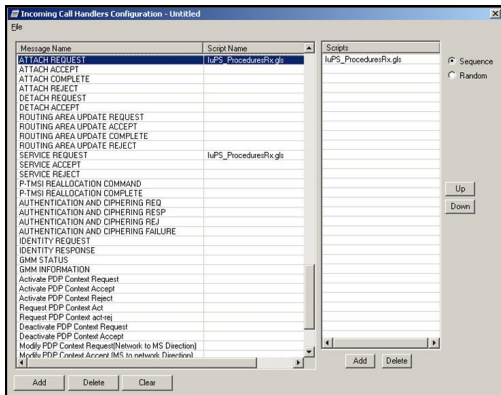


Figure: Incoming Call Handler



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 Protocols and Specifications

Supported Protocols	Standard / Specification Used
Iu-PS Interface	
SCCP	Q.713, CCITT (ITU-T) Blue Book
M3UA	RFC 3332
RANAP	3GPP TS 25.413 V9.1.0
GMM / SM	3GPP TS 24.008 V5.16.0 (2006-06)
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

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

Related Software

[PKS160](#) - MAPS™ - UMTS – Iu-CS and Iuh Interface Emulation

[PKS130](#) - MAPS™ - SIGTRAN (SS7 over IP)

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

[PKS140](#) - MAPS™ - LTE S1 Interface

[PKS142](#) - MAPS™ - LTE eGTP (S11, S5/S8) Interfaces

[XX648](#) – MAPS™ - ISDN

[XX692](#) – MAPS™-GSM A

[XX693](#) – MAPS™-GSM A bis

[XX649](#) – MAPS™-SS7

[XX647](#) – MAPS™-SS7 Conformance Test Suite (Test Scripts)

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

[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://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