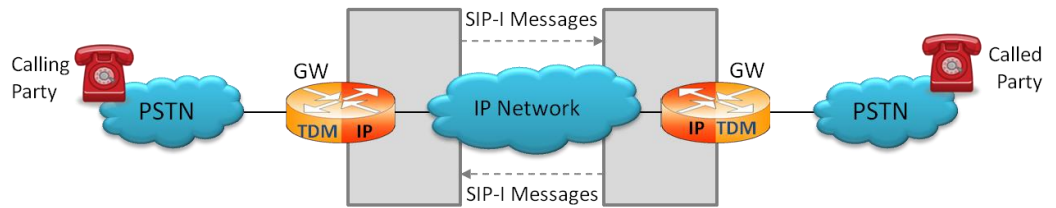


## MAPS™ SIP - I (Scripted SIP-I and SIP-T Protocol Emulation)



Simulates SIP Server and Client entities

Scripted Call Generation and Automated Call Reception

Provides Fault Insertion, & Erroneous Call Flow Testing

Supports a Multipart Payload and/or the ISUP MIME Type

Supports RTP Traffic (requires additional licenses)

Supports Industry Standard Codec Types

Customization of Call Flow with Script and Profile Editors

Option to Change Event Parameters at Run-time

Load Generation Feature for Stress/Load Testing

TCL Client Scripting for Remote Operations

### Overview

VoIP networks predominantly use SIP to setup and tear down voice calls and increasingly for video and multimedia calls. PSTN networks predominantly use SS7 to do the same. PSTN SS7 signaling is quite different from SIP signaling and in many cases PSTN SS7 signaling may be richer than SIP. There may be no one-to-one correspondence between SIP signaling messages and SS7 signaling messages. Also, it may not be possible to enhance SIP to accommodate the additional features of SS7, and vice-versa.

When a SIP-I is used to bridge the SS7 endpoints, the ISUP messages are carried (encapsulated) along with SIP signaling messages.

GL's Message Automation & Protocol Simulation (MAPS™) is a powerful Protocol Test platform-supporting a wide range protocols. MAPS™ SIP-I can simulate SIP-ISUP signaling specification as defined by the ITU / IETF standards ITU-T Q.1912.5.

MAPS™ SIP-I is a test tool/traffic generator can simulate Signaling Gateway / Softswitch as a User Agent Client (UAC) sending SIP requests with ISUP messages and as a User Agent Server (UAS) receiving requests and returning SIP responses with proper ISUP messages attached.

Test cases include general messaging and call flow scenarios for multimedia call session setup and control over IP networks. The application is available as MAPS™ SIP-I (Item # PKS126). With the purchase of RTP Core license (PKS102), MAPS™ supports transmission and detection of various RTP traffic such as, digits, voice file, single tone, and dual tones over IP networks.

Users can remotely control MAPS™ using commands from the TCL environment. Multiple MAPS™ CLI servers can be controlled remotely from single client application (such as TCL, Python, etc). MAPS™ TCL Client application includes a MapsClientIfc interface, a packaged library that enables communication with the MAPS™ Server. TCL (Tool Command Language) Client is a command-line interface (TCLsh85.exe) which is distributed along with MAPS™ Server application, using which any real-time scenarios can be simulated.

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



# GL Communications Inc.

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## Main Features

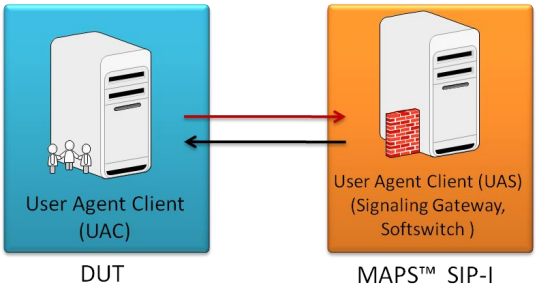
<b>Signaling</b>	<ul style="list-style-type: none"> <li>• Supports both UDP and TCP (Ipv4 and Ipv6).</li> <li>• Generates and processes SIP-I valid and invalid messages.</li> <li>• Each SIP-I message template facilitates customization of the protocol fields and access to the various protocol fields from the scripts</li> <li>• Handles Retransmissions and Remote Retransmissions.</li> <li>• Scripted call generation and call reception.</li> </ul>
<b>Traffic</b>	<ul style="list-style-type: none"> <li>• Supports transmission and detection of various RTP traffic such as, digits, voice file, single tone, and dual tones in IP networks.</li> <li>• Supports various codecs in the Session Description Protocol (SDP)</li> <li>• Supported codec types includes G.711, G.729, G.726, GSM, AMR, EVRC, SMV, iLBC, SPEEX, G.722, and more. Click <a href="#">here</a> for comprehensive information on supported codecs. *AMR and EVRC variants require additional licenses.</li> </ul>
<b>Other Features</b>	<ul style="list-style-type: none"> <li>• Automation, Remote access, and Schedulers to run tests 24/7</li> <li>• Supported on Windows® 7, 8 or higher version operating systems.</li> <li>• Supports 64-bit version to enhance signaling performance</li> </ul>
<b>CLI</b>	<ul style="list-style-type: none"> <li>• Supports Client-Server functionality requires additional license; clients supported are TCL, and Python</li> </ul>
<b>Applications</b>	<ul style="list-style-type: none"> <li>• Simulates Signaling Gateway, Softswitch with SIP-I (Profile C) support to test interworking of PSTN services over IP networks.</li> <li>• Fully integrated, complete test environment for SIP-I or SIP-T.</li> </ul>



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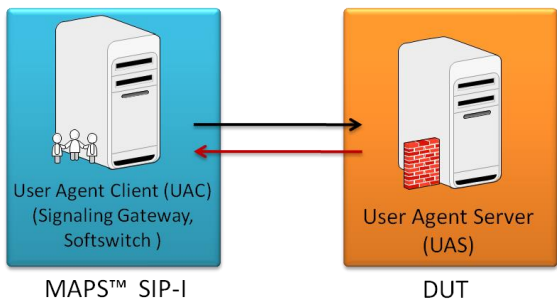
**Scenario 1: MAPS™ SIP-I acting as UAS and testing UAC**

MAPS™ SIP-I acting as UAS receives messages from UAC (DUT) that generates SIP messages.



**Scenario 2: MAPS™ SIP-I acting as UAC & testing UAS**

MAPS™ SIP-I can be configured to act as UAC and to test UAS. This allows the call scenarios to be automated and test DUTs.



**Test Bed Configuration**

The configuration window allows users to setup the required test environment to simulate messaging from different SIP entities such as the User Agent Client (MAPS™) - to - DUT (UAS), and User Agent Server (MAPS™)-to DUT (DUT - SoftPhone, IPPhone). Note that the SoftPhone, IPPhone used as DUT should support SIP-I messages. Default profile is used to configure MAPS™ SIP-I end-users.

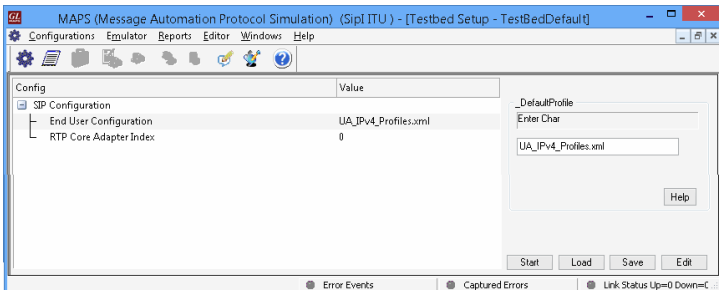


Figure: Testbed Setup

**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.

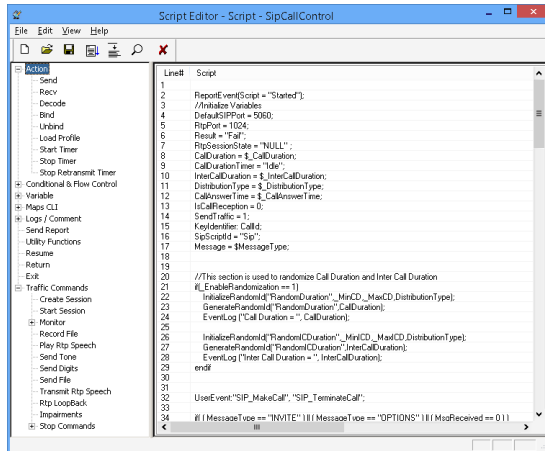


Figure: Script Editor

**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. 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.

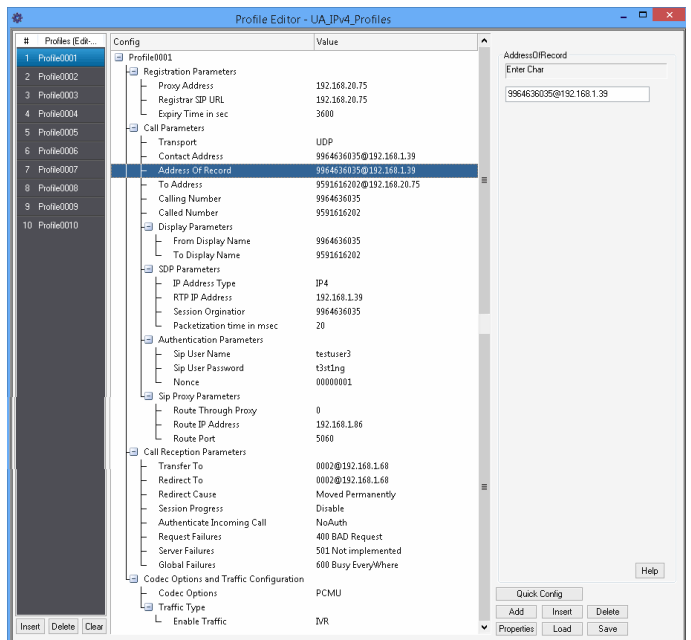


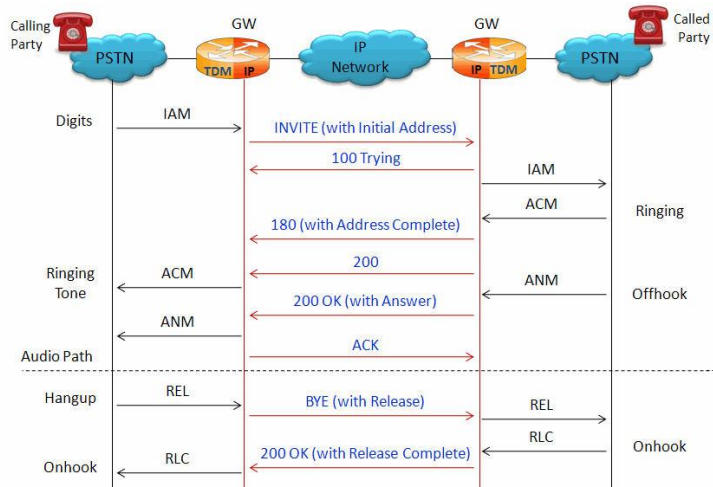
Figure: Profile Editor



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## MAPS™ SIP-I Call Flow Scenarios

MAPS™ SIP-I is configured as a User Agent Client (UAC) in ISUP-IP network. It can generate calls to a Device under Test (DUT) and the DUT can be any IP Phone, Soft phone, Proxies, Registrar, or any SIP Server that supports ISUP-IP interworking.



## 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.

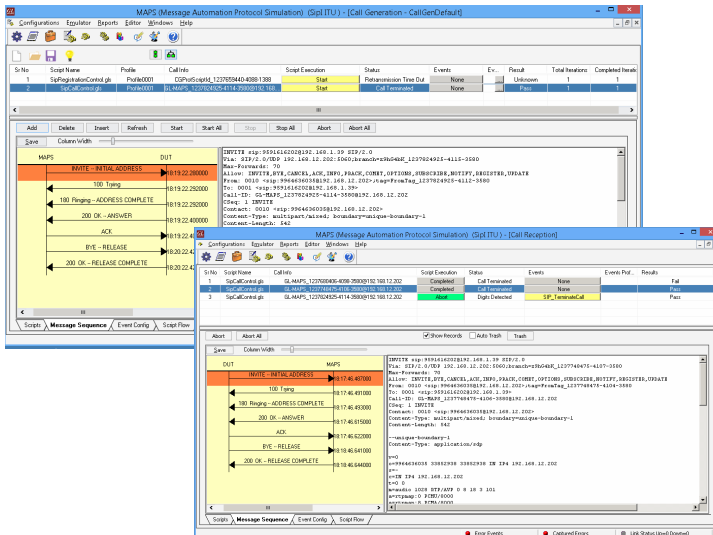


Figure: Call Generation and Reception

## SIP-I Messages

'Messages' are created using pre-defined Message Templates, which are then internally called by the certain commands in the script, based on the scenario requirement. A message template is nothing but a text file containing a SIP message to which ISUP message are attached at the run time. ISUP Message Templates are created using Message Editor, in which user can specify values of certain fields to be supplied at run time.

Users may also create custom message templates and place it in these directories for later use with Script Editor.

SIP-I uses multipart MIME bodies to enable SIP messages to contain multiple payloads (SDP, ISUP, etc).

The SIP headers and encapsulated ISUP bodies form the SIP requests. The SIP headers takes precedence over the ISUP as the contents of SIP headers may be updated in routing within the IP network.

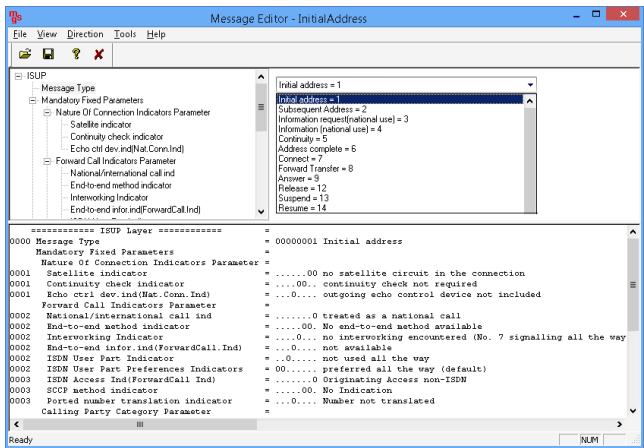


Figure: ISUP Message Editor

The following illustrates the ISUP (IAM) message encapsulation in the SIP (INVITE.txt) message:

send "Invite.txt" SendIp Port "IAMSIP" "InitialAddressImport";

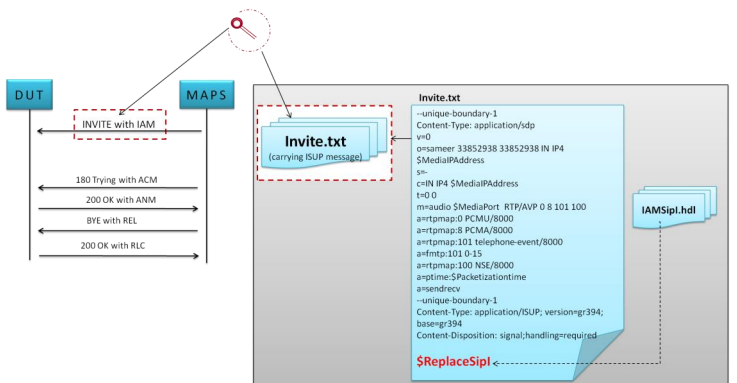


Figure: Generating SIP-I Messages



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## Command Line Interface

The MAPS™ TCL Client application includes a **MapsClientIfc** interface, a packaged library that enables communication with the MAPS™ Server from a TCL environment. The advantage of such communication enables user to control MAPS™ using send and receive commands.

TCL (Tool Command Language) Client is a command-line interface (Tclsh85.exe) which is distributed along with MAPS™ Server application.

Using TCL client, any real-time scenarios can be simulated by sending instructions to the MAPS™ server. MAPS™ Server processes the commands and takes necessary actions. MAPS™ Client can get the server status by exporting the variables.

TestShell or scripting languages such as TCL with library of functional capabilities can easily create compliance tests for simple to complex Next Generation Networks (NGN) voice features.

```

C:\Program Files\GL Communications Inc\MAPS-SIPI\Tcl Client\tclsh85.exe
% load MapsClientIfc.dll
% source StartTestBed.tcl
Connecting to MAPS SIP CLI Server...
Connection Established
Starting TestBedSetup...
TestBedSetup Started
% Run UserAgentServer.tcl "Detect_Digits" "Accept"
Connecting to MAPS SIP CLI Server...
Connection Established
Configured IncomingCallHandler
Waiting For Incoming Call...
Started Script Name = SipCallControl.gls
Receive Call
Profile Loaded
SDP Successfull
Call Established
Codec negotiated is PCMU
RTP Digits Detected
Detected digits are 7890*#ABCD
BYE Received
Call Terminated
Script Stopped
%
  
```

Figure: UserAgentClient TCL Script

## Supported Protocol Standards

Available Standards	Standard / Specification Used
SIP-I (Profile-C)	ITU Q.1912.5 - Interworking between Session Initiation Protocol (SIP) and ISDN User Part ND1007:2001/07, PNO-ISC/SPEC/007- Interworking between Session Initiation Protocol (SIP) and UK ISDN User Part (UK ISUP)
SIP-T	IETF RFC 3372

## Buyer's Guide

[PKS126](#) - MAPS™ SIP-I

[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

[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

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

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

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

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

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

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

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



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