

Overview

GL's MAPS[™] SIGTRAN is an advanced protocol simulator/tester for SS7 simulation over IP Networks. It can simulate a Signaling Gateway and Softswitch ISUP signaling specification as defined by ITU-T standards. The application supports testing network elements, error tracking, regression testing, load testing/call generation and generation of high volumes of ISUP traffic.

MAPS[™] SIGTRAN functionality covers the ITU and ANSI variant of SS7 implementing M3UA, and ISUP protocols. It is able to run predefined test scenarios against ISUP test objects in a controlled & deterministic manner. SS7 SIGTRAN protocol emulation is supported over M3UA, M2UA and M2PA IP transport layers. It is also capable of operating in an environment that interworks between TDM and Sigtran supporting TDM traffic. with optional licensing.

MAPS[™] SIGTRAN High Density supports generation of high volume of calls with traffic for load testing network using MAPS[™] RTP HD network appliance, specialized 1U rack mounted designed to easily achieve up to 20,000 endpoints per appliance (5000 simultaneous calls with duplex traffic per port).

MAPS[™] SIGTRAN Conformance Scripts (requires additional license) are suitable for compliance tests and functional tests, where test objects can be accurately and reliably validated for compliance with ITU-T standard Q.761-764 and Q.784.

MAPS[™] supports <u>Command Line Interface (CLI)</u> allowing remote controlling of the application through multiple command-line based clients.

For more information, please visit <u>MAPS[™] SIGTRAN</u> webpage.

Main Features

- SS7 Simulation over IP
- User-friendly GUI for configuring the SS7 M3UA, M2UA, M2PA layers
- Supports ASP (Application Server Process) or SGP (Signaling Gateway Process) termination types over IP
- Access to all ISUP Message Parameters Initial Address, Subsequent Address, Release messages, and more
- User controlled access to optional ISUP parameters such as timers
- Subsequent Address Message (SAM) configurations available
- Fully Supported Continuity Testing (COT) that includes COT messages
- Supports TDM traffic (digits, voice file, tones, IVR, FAX, Dynamic VF, and Voice Quality) simulation over IP
- Supports Client-Server functionality with additional licenses, clients are TCL, Python, VBScript, Java, and .Net
- Supports conformance testing with additional licenses
- Support of high volume of calls with traffic for load testing network

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Test Bed Setup Configuration

Test Bed Setup provides options to establish communication between MAPS[™] SIGTRAN and the DUT. It includes configuration SCTP mode, M3UA Termination Type, CIC to Circuit mapping, SG and MGC node configuration for traffic. Once the testbed setup is configured properly, ISUP messages can be transmitted and received over IP network using SCTP to the DUT.

End user configuration profile is used to configure MAPS[™] SIGTRAN with end terminal parameters.

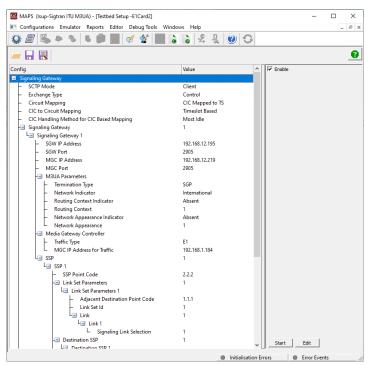


Figure: Test Bed Setup Configuration

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.

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- Action	s# Script	
- Send 1		-
- Recv 2	//Initialize Variables	
Decode 3	ReportEvent (ISUPScript = "Started");	
-Bind	Keyldentifier: opc , dpc , cic ;	
5	CallDuration=\$_CallDuration;	
Unbind 6	CallAnswerTime=\$_CallAnswerTime;	
- Load Profile 7	InterCallDuration=\$_InterCallDuration;	
Start Timer 8	ISUPScriptId="ISUP";	
Stop Timer 10	ProtocolStandard="Isup-Sigtran";	
	StopAll=0;	
Stop Retransmit Timer 11	LocalCICState="";	
Conditional & Flow Control	RemoteCICState="";	
+ If Statements	TDMSessionState = "NOT STARTED";	
Wait Statements	State = "IDLE"; ISUPResult = "Unknown";	
19		
The coop statements	ReattemptCall=0; BindingId="":	
- Add Label 17 18	Binaingia= ; RevBindingid="";	
- GoTo 10	Cause=16:	
Message Handler 20	CICFreed=0:	
	CICFIEEd=0,	
22	if (EnableRandomization == 1)	
Active User Event	InitializeRandomId/RandomDuration, RandomCDMin, RandomCDMax,"uniform"):	
Variable 24	GenerateRandomId(RandomDuration.CallDuration):	
Maps CLI 25	EventLog ("Call Duration = ", CallDuration);	
100	Eroneog (comparation =) comparation);	
Logs / Comment 27	InitializeRandomId(RandomICDuration,_RandomICDMin,_RandomICDMax,"uniform");	
- Send Report 28	GenerateRandomId(RandomICDuration.InterCallDuration);	
Utility Functions 29	EventLog ("Inter Call Duration = ", InterCallDuration);	
Resume 30		
21	InitializeRandomId(RandomCldNo, RandomCalledNoMin, RandomCalledNoMax,"uniform");	
Return 32	GenerateRandomId(RandomCldNo,RandomCalledNumber);	•
- Exit		>

Figure: Script Editor

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Pre-processing Tools (Contd.)

Profile Editor

The 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.

Traffic profiles can be configured to support TDM traffic, various types includes Auto Traffic Digits, Auto Traffic File, Auto Traffic Tones, IVR, Fax, and User-defined traffic.

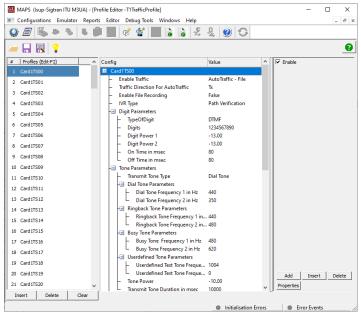


Figure: Profile Editor

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.

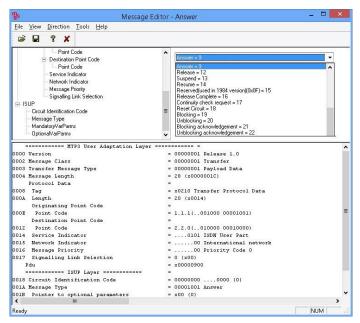


Figure: Message Editor

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Test Setup

MAPS[™] Sigtran can be setup to simulate TDM traffic as shown in the figure. MAPS[™] Sigtran configured to act as **SIGNALING GATEWAY** (SGW) and **MEDIA GATEWAY CONTROLLER (MGC)** terminals in the SS7 IP network is connected to the GL's T1/E1 Analyzer units simulating TDM traffic.

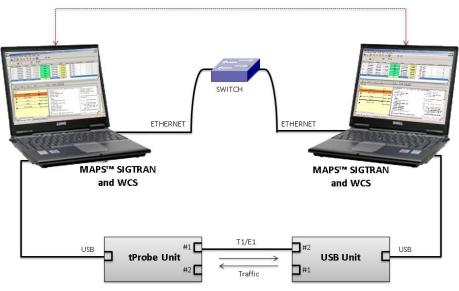


Figure: TDM Traffic Simulation Test Setup

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.

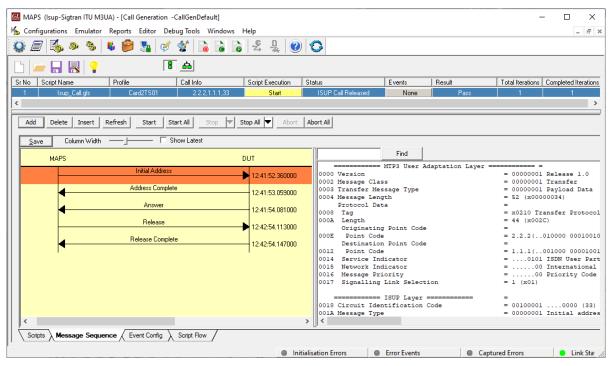


Figure: Call Generation

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Call Generation and Call Reception (Contd.)

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No Script Name	Profile	Call Info	Script Execution	Status	Events	Results
1 M3UA.gls		1001	Stop	ASP Active	None	Pass
2 Isup_Call.gl	s	1.1.1,2.2.2,33	Completed	ISUP Call Released	None	Pass
Stop Stop All Ab	ort 🛛 Abort All 🛛 🔽 Show Reco	rds 🔲 Select Active Call 🗌 Auto	Trash Trash			
<u>Save</u> Column Widt	h ──_j─── □ Showl	_atest				
DUT		MAPS		Find		
DOI		MAFS		MTP3 User Adap	tation Layer ======	
	Initial Address	12:41:53		ersion		00000001 Release
	Address Complete			lessage Class Transfer Message Type		00000001 Transfe 00000001 Payload
	riddiote complete	12:41:53		lessage Length		52 (x00000034)
	Answer	12:41:54		rotocol Data	=	
		12:41:54	10000			x0210 Transfer 1
	Release	12:42:54		Length Originating Point Code	=	44 (x002C)
	Release Complete	-		Point Code	_	2.2.2(010000)
← −	Helease Lomplete	12:42:54		Destination Point Code	=	
I.		1		Point Code		1.1.1(001000
				Service Indicator Network Indicator		0101 ISDN Us
				Message Priority		00 Priori
				Signalling Link Selection		1 (x01)
			Pd			x210001000000A
				===== ISUP Layer ===		
				ircuit Identification Cod Message Type		0010000100 00000001 Initia
				essage type		COCCOUNT INICIA.
<			> <			
Scripts Message Seg	uence Event Config Scr	ipt Flow				

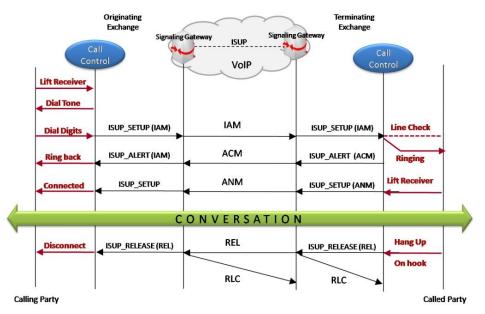
Figure: Call Reception

Typical SS7 SIGTRAN Call Procedure

A very basic call flow involving two telecom switches to exchange ISUP messages is depicted in the figure.

The most common messages are:

- Initial Address Message (IAM)
- Address Complete Message (ACM)
- Answer Message (ANM)
- Release (REL)
- Release Complete (RLC)



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Command Line Interface

MAPS[™] can be configured as server-side application, to enable remote controlling of the application through multiple command-line based clients. Supported clients include TCL, Python, VBScript, Java, and .Net.

Clients can remotely perform all functions such as start testbed setup, load scripts, and profiles, apply user events such as send digits/ file/tones, detect digits/file/tones, dial, originate call, terminate call, start and stop traffic and so on. User can also generate and receive calls through commands. This client application is distributed along with MAPS[™] Server application

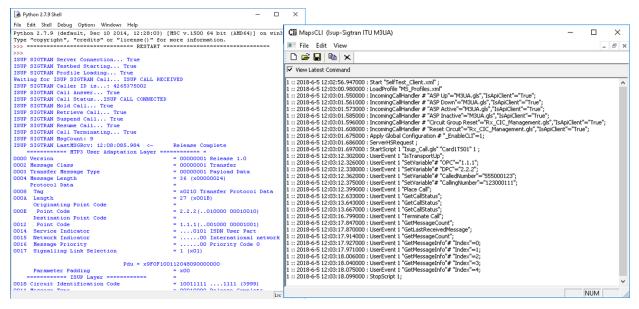


Figure: MAPS CLI Server and Python client sample script

Supported Protocols and Specifications

M3UA	MTP3		
	M2PA	M2UA	
	SCTP		

Supported Protocols	Standard / Specification Used
ISUP (ITU)	ITU - Q.761, Q.762, Q.763 and Q.764
ISUP (ANSI)	ANSI - T1.113.1 to T1.113.4
ISUP (UK)	ND1007:2007/01 TSG/SPEC/007
M3UA (ITU)	RFC 4666
M3UA (ANSI)	RFC 4666
M2PA	RFC 4165
M2UA	RFC 3331



Buyer's Guide

Item No	Product Description
<u>PKS130</u>	MAPS [™] SIGTRAN Emulator

Item No	Related Software
<u>PKV100</u>	PacketScan™ (Online and Offline)
<u>PKV105</u>	SIGTRAN Analyzer (Optional with PacketScan™)
<u>XX610</u>	w/ Transmit and Receive File capability
<u>XX620</u>	w/ DTMF/MF/MFC-R2 + answer/place call capability
XXFTO	Fax Emulation for T1 E1 and Analog Interfaces
Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer with Basic Analyzer Software
XTE001	Dual T1 E1 Express (PCIe) Boards (requires additional licenses)

<u></u>	
<u>FTE001</u>	QuadXpress T1E1 Main Board (Quad Port- requires additional licenses)

ETE001 OctalXpress T1E1 Main Board plus Daughter Board (Octal Port– requires additional licenses)

<u>Note</u>: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more information, please visit <u>Signaling and Traffic Simulator</u> webpage.



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