Deployment of Products with Multiple Features & Protocols

Customized Signaling for Each Channel

Provides Fault Insertion, & Erroneous Call Flow Testing

Remote Access to T1/E1 Analyzers Systems

E1 MFC-R2 (All Variants)

Voice Feature Testing Application for Next Generation Networks (NGNs)

T1 Loop Start, Ground Start, Wink Start, FGD, CAM A

Custom Configured CAS Protocol

Digital R1 Wink Start, EUC

Multiple T1/E1 Interfaces

Easy-to-Use Call Control Scripts

High Density G.711 NB Solution (up to 96 Analog Channels)

Supports Script Editor and Profile Editor Utilities

Command Line Interface to Remotely Access MAPS™ Functionalities

MAPS[™] CAS Emulator (Scripted Channel Associated Signaling Emulation)



Overview

GL's **Message Automation and Protocol Simulation (MAPS™)** platform supports CAS signaling simulation over T1 E1 network. MAPS[™] CAS automates the testing procedure allowing the users to place calls on a single or on all timeslots. Calls are established, once the signaling information such as signaling bits, DTMF/MF digits, or Tones are sent/detected. Also, MAPS[™] CAS Emulator is designed to support TDM traffic across CAS network.

This simulator provides a complete solution for testing, troubleshooting, and maintaining devices and networks implementing CAS. MAPS[™] CAS Emulator supports powerful utilities like Script Editor and Profile Editor which allow new scenarios to be created or existing scenarios to be modified.

With the purchase of additional licenses (xx610, xx620, xxFT0) traffic can be simulated over T1/E1 interfaces. Supported traffic includes transmission and detection of TDM digits, voice files, single tone, dual tone, speech and FAX. Also supports various traffic events simulation during the course of a call.

GL offers two solutions for high density 2-wire emulation using MAPS™ CAS with additional Channel Bank (APSCB-24 or APSCB-48):

- High density G.711 NB solution (supports up to 96 Analog Channels) using MAPS™ CAS
- Testing Hybrid networks using MAPS[™] CAS

MAPS[™] also supports a Command Line Interface (CLI) such as the TCL, Python, VBScript, Java, and .Net scripting tools to provide the capability of remote operation, automation, and multi-site connectivity. TCL Client runs TCL scripts which executes commands instructing the MAPS[™] CLI Server to run a particular script that emulates the state machine to place or answer calls.

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



Page 2

Call Scenarios Caller ID Two-way Calling Three-way Calling • Three-way Calling with Calling Party Number Identification VMWI – Voice Mail with MWI (message waiting indicator) and SDT (stutter dial tone) Call Waiting – Detect tone, call id, flash to accept call ٠ **Protocols** T1 Wink Start (R1 wink) T1 Loop Start and T1 Ground Start • T1 Feature Group D (FGD) • T1 Immediate Start T1 CAMA (Centralized Automated Message Accounting) E1 MFC-R2 (All variants, full /semi compelled) E1 European Digital CAS (EUC) • E1 Digital E & M E1 International Wink Start • F1 Sweden P7 • Any User-Defined CAS Protocol **Functionalities** Voice Prompt Confirmation (requires VQT) Voice Quality and Delay Measurements (requires VQT) • Detect Caller ID, and VMWI Basic telephony functions - On-hook, Off-hook, Detect ringing signal, Dial, and 3-Way Call (using flash hook) • Dial Tone Delay, Post Pickup Delay, special dial tone, stutter dial tone, special information tone, call waiting, call in progress tone, reorder tone, busy tone, congestion tone, confirmation tone, howler tone, and ringback tone • Fax - Send /Receive fax image (TIFF format) file from/to the specified location. • Call Failure events Call Completion events Call Drop (sustain calls) events Voice feature testing application for Next Generation Networks (NGNs) • Supports ANI and DID identification Solutions High density G.711 NB solution (supports up to 96 Analog Channels) using MAPS[™] CAS Testing Hybrid networks using MAPS[™] CAS **CLI Capabilities** TCP/IP based Client Server application API available for Tcl, Python, .NET, Java Capability of remote operation, automation, and multi-site connectivity with Command Line Interface (CLI) • support. Reporting Central Database of events/results/errors Multi-User, Multi-Test, Multi-Reporting • • Executed test cases Successful test cases • • Failed test cases Failed reason Test results showing voice quality, failed call attempts, dropped calls • PDF and CSV file formats 🜑 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

Document Number: XX651-5.8.12-01

Main Features

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Solution 1: High Density G.711 NB solution with MAPS[™] CAS and Channel Bank



Solution 2: End-to-end Hybrid Network Testing using High Density MAPS[™] CAS and Channel Bank



Hybrid Network Testing

Features	Hybrid Network Test Solution - MAPS™ CAS
Space Considerations	1U (MAPS [™] CAS) 1U (MAPS [™] SIP/ MAPS [™] MGCP) 1U (Audio Codes Media Gateway) 3U (Channel Bank)
Ports	Quad T1 (4 x T1) 96 Analog Channels
FXO Audio	NB Support
Operation	Fully Independent Ports with control b/w systems
Bulk Call	Yes – Supports

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Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS[™] CAS and the DUT. It includes parameters for configuring T1/E1 (GL) server, CAS protocol specific Signaling Bits parameter, Dial Digit Parameters and Wink parameter settings to simulate CAS Signaling and traffic over T1/E1.

Default CAS_Profiles.xml file is used to configure end-user parameters.



Figure: Testbed Setup Configuration

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Pre-processing Tools

Script Editor

GL's MAPS[™] CAS script editor is based on a self-describable language that can define the behavior of CAS Signaling procedure. Functions such as inbound, outbound, signaling digits detection and transmission are all defined within the script. Additionally, more advanced script may also be defined in the script editor. Definitions for Tx traffic such as Tx File, Tx Tones, Tx digits, call duration, stop traffic are user-definable within each script.

Action Bind - Unbind - Load Profile - Start Timer - Stop Ritransmit Timer	Line# 1 2 3 4 5 6	Script //Fast Simulation //// //TimeStot Allocation ReportEvent (15 = 15);	 	
Action Bind Unbind Load Profile Start Timer Stop Timer Stop Retransmit Timer	Line# 1 2 3 4 5 6	Script //Fax Simulation //// //TimeSlot Allocation ReportEvent {{15 = 15}		
Bind Unbind Load Profile Start Timer Stop Timer Stop Retransmit Timer	1 2 3 4 5	//Fax Simulation //// //TimeSlot Allocation Report(Event (TS = TS);		
Unbind Load Profile Start Timer Stop Timer Stop Retransmit Timer	2 3 4 5	//TimeSlot Allocation ReportEvent (TS = TS);		
Load Profile Start Timer Stop Timer Stop Retransmit Timer	3 4 5	//TimeSlot Allocation ReportEvent (TS = TS);		
Start Timer Stop Timer Stop Retransmit Timer	4 5	ReportEvent (TS = TS);		
Stop Timer Stop Retransmit Timer	5	the second		
Stop Retransmit Timer		EventLog ("TS = ", TS);		
Stop Retransmit Limer	2	HeserveUniqueId "UASTS" TS;		
	6	E ventLog (is Unique = , isUnique);		
Conditional & Flow Control	i i i	BenortEvent (TSStatus - "TS is alreadu in Lice")		
If Statements	10	EventLog ("Another Call is Active on this TS"):		
🗭 Wait Statements	11	exit;		
- Loon Statements	12	else		
Odd Label	13	ReportEvent (TSStatus = "TS is Unique");		
Add Label	14	EventLog ("TS is Unique");		
	15	endif		
Message Handler	16	Taskid=U; Exclosure Time Out 2000000		
User Event	19	raxbession1 metout = 200000; ExcGessionStartTimeOut = 200000;		
Active User Event	19	TyBy create trimeour = 30000,		
Variable	20	Status="TDM Session Stated":		
Mans CI I	21	ActiveUserEvent: "Tx-FAX", "Rx-FAX", "Terminate Session";		
http://cei	22			
Logs / Comment	23	wait;		
Send Report	24			
Utility Functions	25	"Un France vent":		
Resume	26	HeportEvent (FAX_Detection = FAX_Detected);		
Return	20	TrafficEventType == PaxinioDetected (
Exit	29	Eventl og ("Eax Status" : "EaxStatus):		
Traffic Commands	30	EventLog ("Fax Direction: "Direction):		
Costs Service	31	EventLog ("Fax CardNo: ",CardNo);		
Create Session	32	EventLog ("Fax TimeSlot: ",TimeSlot);		
Monitor	33	EventLog ("Fax Time: ",Time);		
Record File	34	EventLog ('Fax ModemType: '',ModemType);		
Send Tone	35	E ventLog ("Fax ModemHate: ",ModemHate);		
- Send Digits	36	if (EavOration are "EavTransmissionOracted")		
Send File	10°/			



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.

Users can configure the traffic options for Auto traffic type or User -defined traffic type. Supported traffic configuration includes Send/Receive file, DTMF/MF digits, and Single/Dual tones.

Configurations Emu	lator Reports Editor Windows Help		- 6
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Card1TS05	- Dialing Options		
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Card1TS07	H Ring Signal Detection Options		
Card1TS08	- Number Of Rings	2	
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	 Local Call Duration Timer in msec 	0	
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ert Delete Clear			Properties

Figure: Profile Editor

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Typical Call Flow Scenario



Figure: Typical CAS Call from Side A to Side B

The following are the typical CAS signaling procedures supported by $\mathsf{MAPS^{m}}$ CAS -

- E1 MFC-R2 Signaling Defined by the ITU Recommendations Q.421-Q.442, uses a multi-frequency compelled signaling protocol to exchange address information. Sends MFC-R2 forward and backward tones per CCITT specifications. Currently, MAPS[™] CAS includes ready profiles for India, China, and Mexico. Different country specific implementations will be supported in future.
- E1 European Digital CAS (EUC)
- E1 Digital E & M
- E1 International Wink Start
- E1 Sweden P7
- T1 Wink Start (R1 wink) The R1 wink protocol uses one-bit signaling, and the wink (brief presence of current or variation of the signaling bit) that the inbound side uses to indicate readiness to receive address signaling.
- T1 Loop Start
- T1 Ground Start
- T1 Feature Group D (FGD)
- T1 Immediate Start
- T1 CAMA (Centralized Automated Message Accounting)
- Any User-Defined CAS Protocol

Outbound and Inbound CAS Signaling

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).

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Figure: Call Generation

Event Log

MAPS[™] provides Events, Error Events, and Captured Errors log encountered during the progress of the call. The events are saved in the database which can be accessed via web interface.

Protocol specific signaling events and the traffic events are logged along with the Call Trace ID, Script Name, Script ID, and the Timestamp of the occurred event.



Figure: Events Log

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Command Line Interface



Figure: Typical MAPS[™] CAS Test System with TCL Client

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.



Figure: MAPS[™] CAS TCL Script

Buyer's Guide

XX651 - MAPS[™] CAS Emulator (requires xx610, xx620, and xx630) xx610, xx620, xx630 - TDM Traffic Options

Related Software

- XX092 T1/E1 Channel Associated Signaling Analyzer
- XX649 MAPS[™] SS7 Emulator
- XX694 MAPS[™] MAP (B, C, D, E, F, G, and H interfaces)
- XX647 MAPS[™] SS7 Conformance Test Suite (Test Scripts)
- PKS132 MAPS™ MAP Emulation over IP
- XX648 MAPS™ ISDN Emulator
- XX692 MAPS™ GSM -A Interface Emulator
- XX693 MAPS[™] GSM- Abis Interface Emulator
- PKS130 MAPS™ SIGTRAN (SS7 over IP)
- PKS135 MAPS[™] ISDN -SIGTRAN (ISDN over IP)
- PKS120 MAPS[™] SIP
- PKS121 MAPS[™] SIP Conformance Test Suite (Test Scripts)
- PKS122 MAPS™ MEGACO
- PKS123 MAPS[™] MEGACO Conformance Test Suite (requires PKS122)
- PKS124 MAPS[™] MGCP (with MGCP Conformance 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
- <u>ETE001</u> OctalXpress T1E1 Main Board plus Daughter Board (Octal Port

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

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