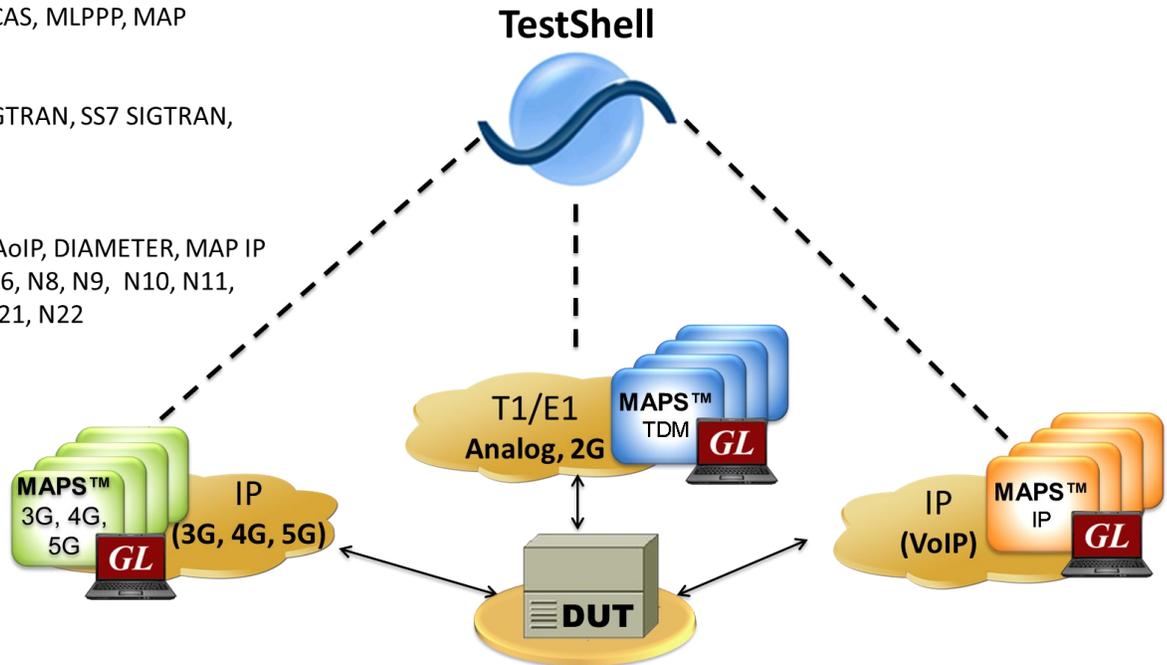


MAPS™ - CLI and TestShell Framework

T1/E1, Analog, 2G:
ISDN, SS7, GSM, CAS, MLPPP, MAP

IP VoIP:
SIP, SIP-I, ISDN SIGTRAN, SS7 SIGTRAN,
MEGACO, MGCP

IP (3G, 4G, 5G):
LTE, UMTS, GSM AoIP, DIAMETER, MAP IP
N1, N2, N3, N4, N6, N8, N9, N10, N11,
N12, N13, N14, N21, N22



Overview

GL's MAPS™ (Message Automation and Protocol Emulation) is a protocol and traffic simulation and conformance test tool that supports a variety of protocols such as SIP, MEGACO, MGCP, SS7, ISDN, GSM, MAP, CAS, LTE, UMTS, SS7 SIGTRAN, ISDN SIGTRAN, SIP I, GSM AoIP, Diameter and others. Along with user friendly GUI and scripting operation, MAPS™ supports a **Command Line Interface** such as the Python, TCL Scripting (Tool Command Language), and others.

A typical application is with **QualiSystems' TestShell** as the centerpiece for achieving network wide automation for testing telecom services and telecom network equipment. **TestShell** is an enterprise software framework offering complete Lab Management, Device Provisioning and Test Automation solutions for engineers. TestShell has a TCL Client built in, with scripting, drag and drop interface. This makes the system compatible with GL's MAPS™ Protocol Emulation software. TestShell / TCL Client runs TCL scripts which executes commands, that instructs the MAPS CLI Server to run a particular script that emulates the state machine to place or answer calls for the protocol specified.

MAPS™ TCL Interface (MAPS Client IFC) application includes a MapsClientIfc.dll file, a packaged library that enables communication with the MAPS™ Server from a TCL environment. The advantage of such communication enables user to control MAPS™ by sending commands and receiving responses in a scripting language already familiar with many users.

For more information, please visit [MAPS™ APIs for Complete Automation](http://www.gl.com) webpage.



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

Typical applications of **GL's MAPS™** integrated with **QualiSystems' TestShell** include:

- TDM, VoIP, and Wireless protocol and Voice traffic testing - such as 2wire CAS or SIP VoIP
- Detailed feature testing – such as foreign country call progress signals
- Regression testing – such as thousands of automated call script execution
- Load testing – hundreds to thousands of simultaneous calls
- Continuity of voice path between end points - such as a SIP to ISDN endpoints
- Voice Quality Testing – such as PESQ or E-model
- Signaling and digit testing – such as robbed bit signaling, SIP, etc.
- Registration and Authentication testing – such as for SIP VoIP systems

Supported Protocols	
5G Protocols	N1 N2, N4 (Coming soon) N3, N6, N8, N9, N10, N11, N12, N13, N14, N21, N22
4G Protocols	LTE S1, LTE eGTP [S3, S4, S5, S8, S10, S11 and S16], LTE Diameter [S6a, S6d, S13, Cx/Dx, Gx, Rx, SLg, SLh], LTE X2-AP, LTE SGs, and LTE SLs.
3G Protocols	UMTS IuCS, IuH (over IP), UMTS IuPS (over IP), UMTS Gn Gp (over IP), UMTS IuPC
IP Protocols	SIP, MEGACO, MGCP, SIP I (SIP ISUP), ED137 (Air Traffic Management) SS7 SIGTRAN (SS7 over IP), ISDN SIGTRAN (ISDN over IP), INAP IP (ANSI, ITU) GSM AoIP (GSM A over IP), GSM Lb, MAP IP (MAP over IP), GPRS Gb over IP, CAP IP (ANSI, ITU), Skinny
TDM, 2G Protocols	ISDN & LAPD, SS7, GSM A, GSM Abis CAS, MC-MLPPP, MAP, CAP, INAP, IUP

Main Features

- MAPS™ CLI with TestShell framework offers complete Lab Management, Device Provisioning and Test Automation solutions.
- A unified solution for advanced testing with intuitive drag and drop user interface
- Tests can easily be executed over multiple test stations and at distributed testing labs.
- Support for a wide range of test setups, interfaces, protocols, and script languages. Examples include CAS and SIP Test Systems that permit automated testing of network devices.
- MAPS™ CLI streamlines both the source script and the output by executing only user requested messages.
- Simultaneous bulk calls capability.
- Remote monitoring capability.
- All script commands are simple and self-explanatory.
- Compatible with Windows® 7/XP Operating System.

Working Principle of MAPS™ and TestShell Integration

Shown below is the working principle of the MAP™ CLI Test System.

- TestShell / TCL Client runs TCL scripts which executes the command, that instructs the MAPS™ CLI Server.
- MAPS™ TCL interface interprets the User Events from TCL to MAPS CLI Server and vice versa.
- MAPS™ CLI Server runs the CLI script which emulates the state machine to place/answer the call or send/receive traffic.
- In case of T1 E1 Protocols, MAPS™ CLI Server additionally interacts with the T1 E1 WCS server to perform the requested task. The reports are generated for the events performed and is sent back to TestShell / TCL via MAPSTCL.

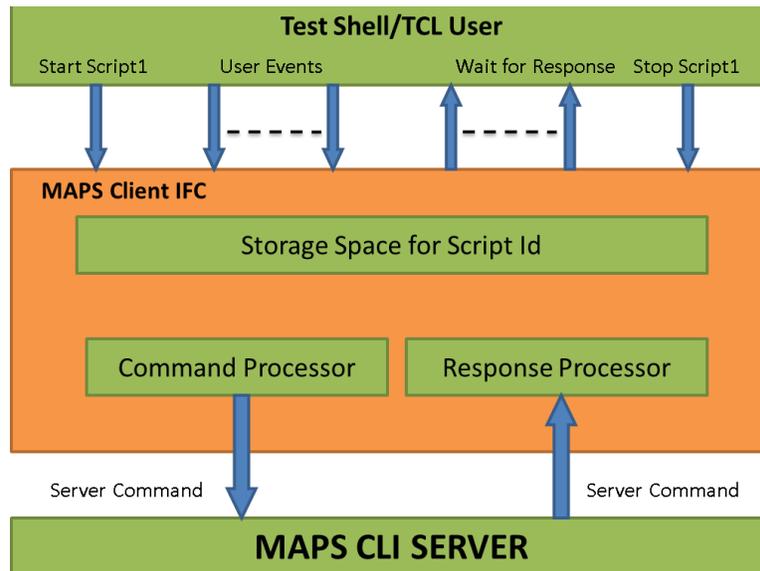


Figure: Working Principle

TestShell with TCL Client and TCL Scripting

QualiSystems' TestShell comes with TCL Client - a client application that includes a *command-line* interface (Tclsh85.exe) into which client users may key in commands or load commands from previously saved files.

MAPS TCL interface includes **MpsClientIfc.dll** file, a packaged library that acts as an interface between MAPS™ Server and its TCL users through TestShell.

```

Z:\BACKUP\MAPS-T1E1-IP-3G\COMMON Binar...
% source Sample_DetectDialTone.tcl
Connection Established
Starting Scripts...
Line 1 Offhook...
Pass
Line 1 Detecting Dial Tone..
Pass
Line 1 Onhook...
Pass
Connection Closed
Press Enter to Exit_

Z:\BACKUP\MAPS-T1E1-IP-3G\COMMON Binar...
% source VerifySpeech.tcl
Starting Scripts...
Line 1 Detecting Speech...
Fail
Connection Closed
% source VerifySpeech.tcl
Connection Established
Starting Scripts...
Line 1 Detecting Speech...
Pass
Connection Closed
% _
  
```

Figure: TCL Client

MAPS™ CLI Server

MAPS™ CLI Server is an executable which inherits all features of MAPS™ without GUI. It listens to a TCP message socket to receive and execute commands from client and sends the responses back to client.

CLI Server script execution is Event Driven, i.e., Server detects the Events such as Tone, Digits, Tx File Rx File, Signals etc., and sets or resets predefined Variables.

- **Signaling Events:** Signaling events are triggered when any protocol signaling messages are detected such as Offhook, OnHook, Seizure, AnswerCall, PlaceCall, Terminate, & so on.
- **Traffic Events:** Traffic events are triggered when any traffic other than signaling are detected such as Tone, Digits, File, and others.

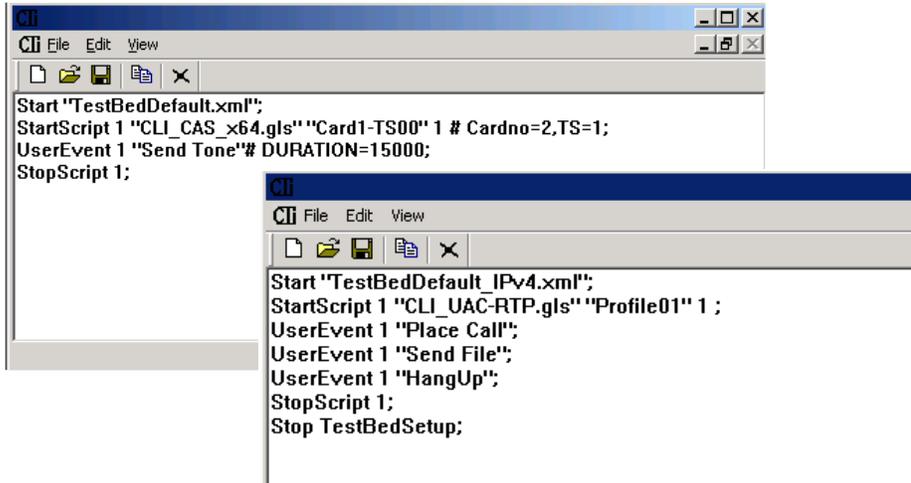


Figure: MAPS™ CLI Server

T1 E1 WCS Server (applicable only for T1 E1 Protocols Only)

Windows Client/Server software performs all CAS emulation primitives including signaling, tone detection, call progress signals, file transfer, and many more functions.

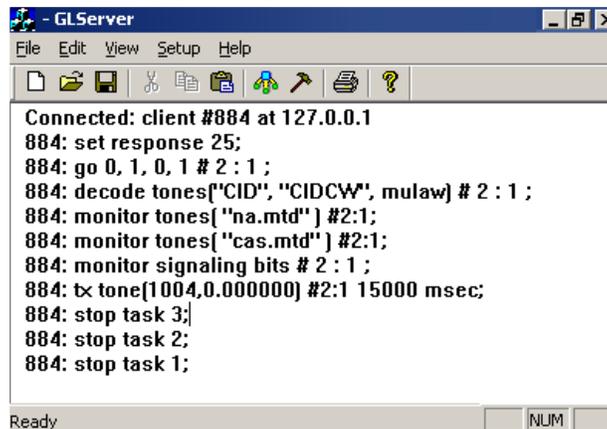


Figure: GL's WCS Server

A Typical MAPS™ CAS Test System

As depicted in the figure below, MAPS™ CAS CLI test system consists of the following -

- TestShell with a TCL interface communicating over TCP/IP
- MAPS™ Client IFC, MAPS™ CAS CLI Server, T1 Software (including Windows Client Server software) and a Dual T1 Card
- Analog Hardware with FXO Cards
- A patch panel for RJ-11 connections to the outside world

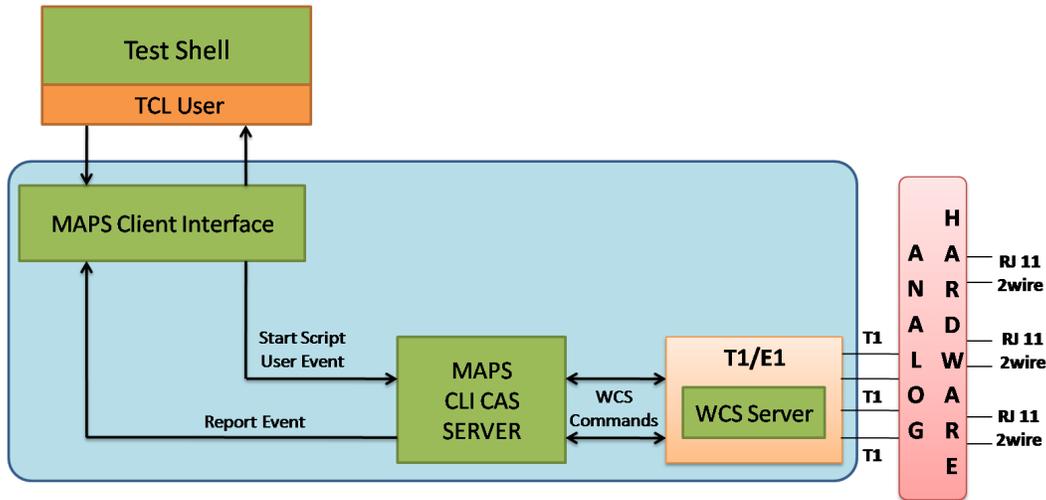


Figure: CAS Test System Modules

A Typical MAPS™ SIP Test System

As depicted in the figure below, MAPS™ SIP CLI test system consists of the following -

- TestShell with a TCL interface communicating over TCP/IP
- MAPS™ Client IFC, and MAPS™ SIP CLI Server

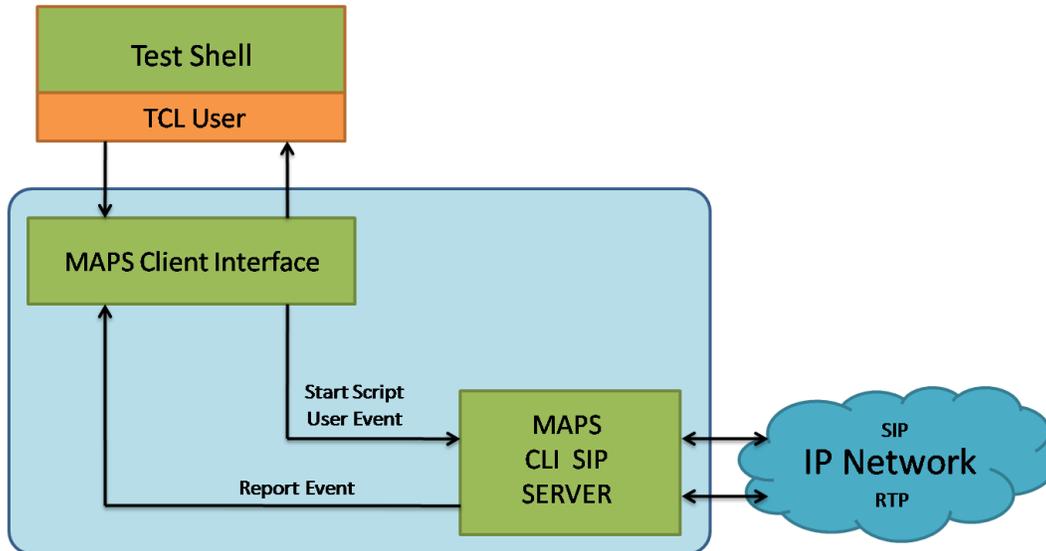


Figure: SIP Test System Modules

Sample TCL Script (Send_File.tcl)

```
#Sample TCL Script (Send_File.tcl)
```

```
set cliMapsSip 1
```

```
set Line1 1
```

```
set ipaddr "192.168.1.78"
```

```
set port 10024
```

```
load mapsclientfc.dll
```

```
##### Connecting to MAPS SIP CLI Server #####
```

```
puts "Connecting to MAPS SIP CLI Server..."
```

```
maps Connect $cliMapsSip $ipaddr $port
```

```
##### Starting TestBedSetup #####
```

```
puts "\nStarting TestBedSetup..."
```

```
maps Cmd $cliMapsSip {Start "TestBedDefault_IPv4.xml"}
```

```
set StartStatus "Null"
```

```
waitforevent $cliMapsSip StartStatus 10 sec
```

```
if { $StartStatus == "Started" } {
```

```
##### Sending File #####
```

```
puts "\nSending File from Line1..."
```

```
##### Applying Send File UserEvent #####
```

```
maps cmd $cliMapsSip UserEvent $Line1 {"Send File"}
```

```
set TrafficStatus "null"
```

```
##### waiting for Traffic Status #####
```

```
waitforevent $cliMapsSip $Line1 TrafficStatus 50 sec
```

```
if { $TrafficStatus == "RTP File Sent" } {
```

```
puts "\nRTP File Sent"
```

```
}
```

```
##### Stopping Script #####
```

```
maps cmd $cliMapsSip StopScript $Line1
```

```
puts "\nScript Stopped"
```

```
}
```

```
##### Stopping Script #####
```

```
maps cmd $cliMapsSip Stop TestBedSetup
```

```
puts "TestBedSetup Stopped"
```

```
#### Disconnecting from MAPS SIP CLI Server ####
```

```
maps Disconnect 1
```

Buyer's Guide

Item No	Product Description
xx651	MAPS™ CAS
xx651	MAPS™ CAS CLI Server
XX600	Basic Client/Server Scripted Control Software
PKS120	MAPS™ SIP
PKS120	MAPS™ SIP CLI Server
PKS121	MAPS™ SIP Conformance Scripts

For more information, please visit [Signaling and traffic simulator](#) webpage.



GL Communications Inc.

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(Web) www.gl.com - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) info@gl.com