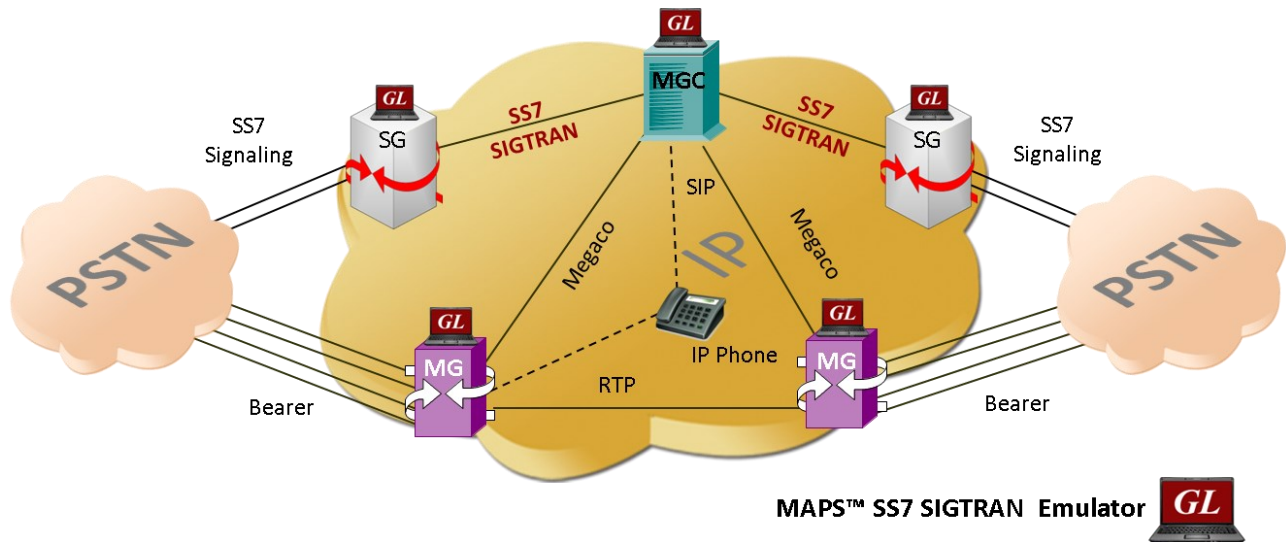# MAPS™ SIGTRAN (SS7 over IP)

MAPS™ SS7 SIGTRAN Emulator

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 pre-defined 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 Command Line Interface (CLI) allowing remote controlling of the application through multiple command-line based clients.

For more information, please visit MAPS™ SIGTRAN 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.
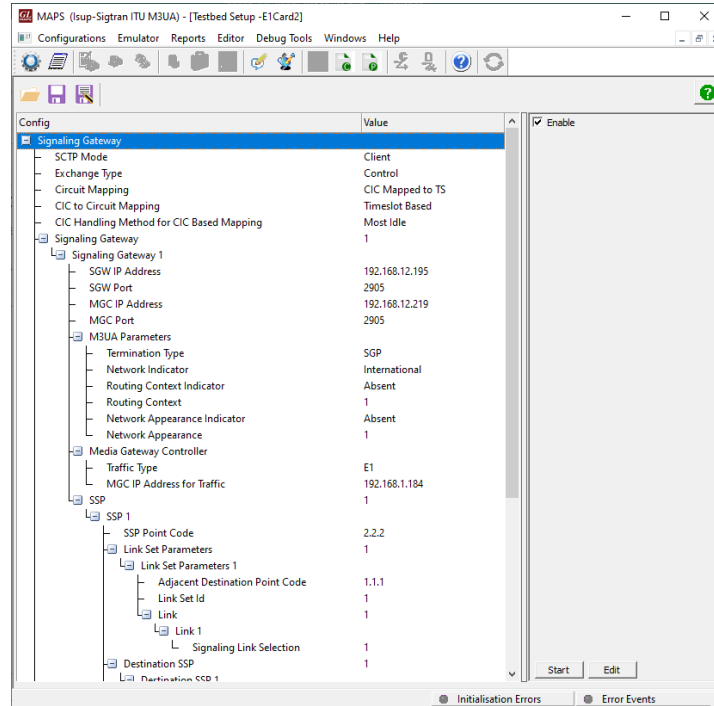

Figure: Test Bed Setup Configuration

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.
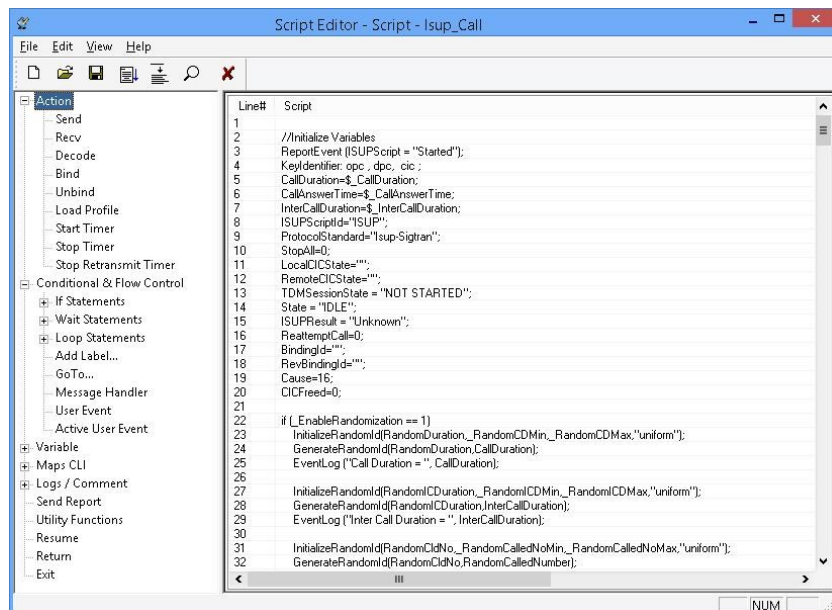

Figure: Script Editor

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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.
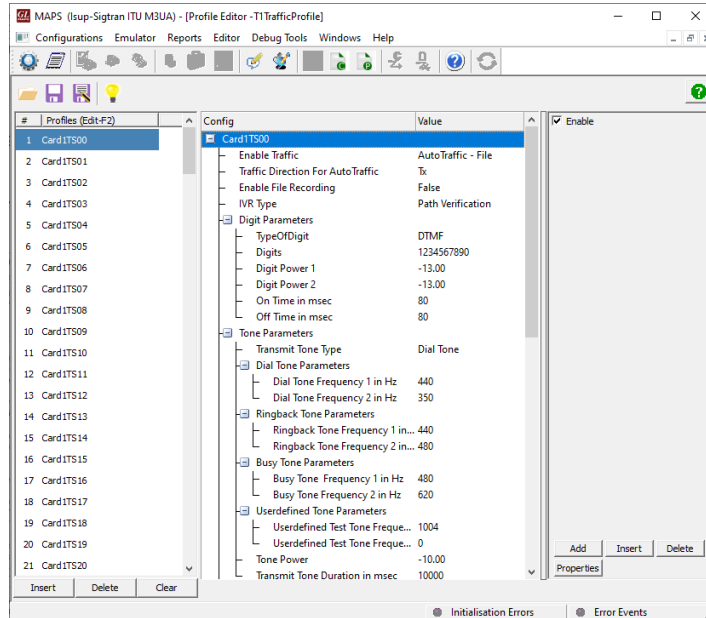

Figure: Profile Editor

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.
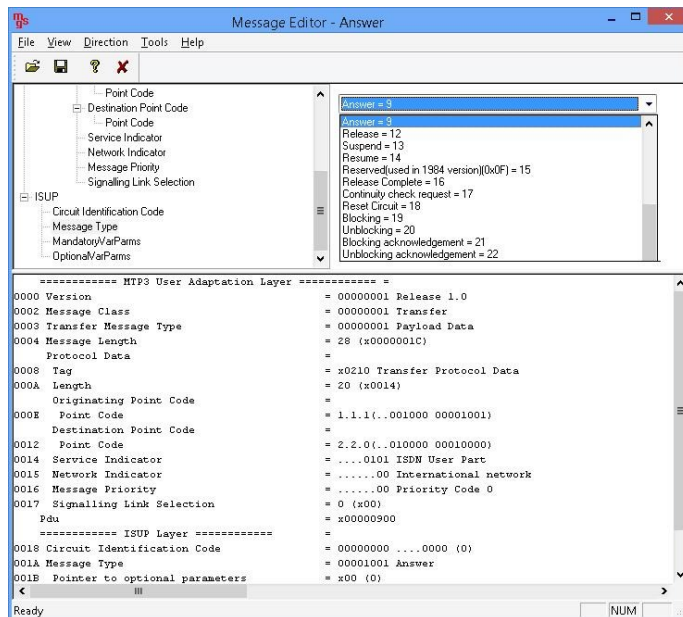

Figure: Message Editor

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.
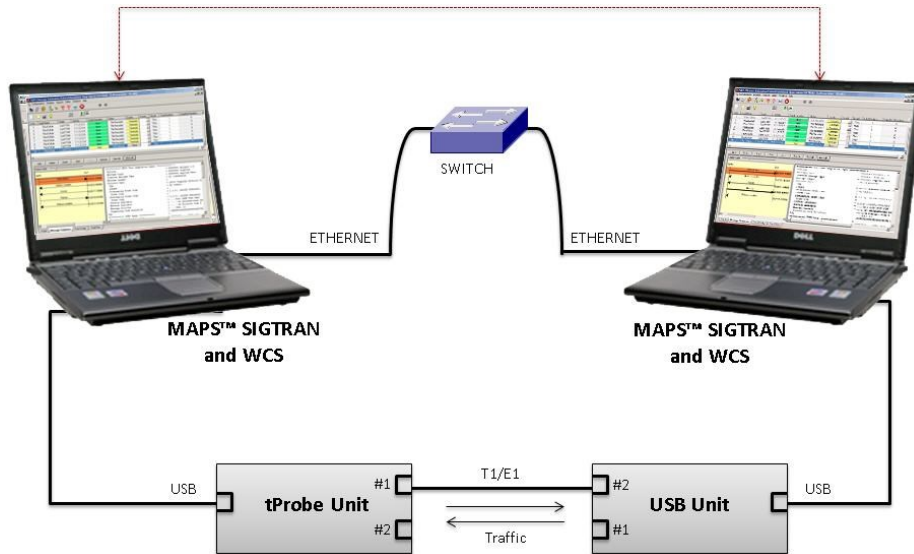

Figure: TDM Traffic Simulation Test Setup

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.
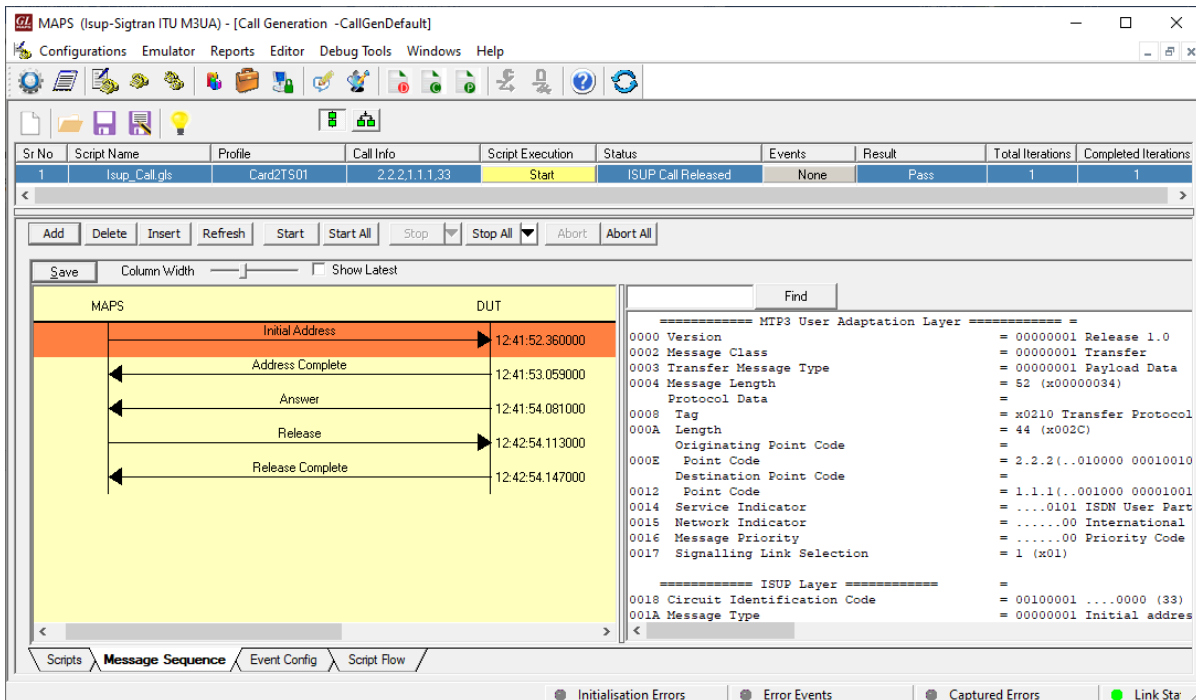

Figure: Call Generation

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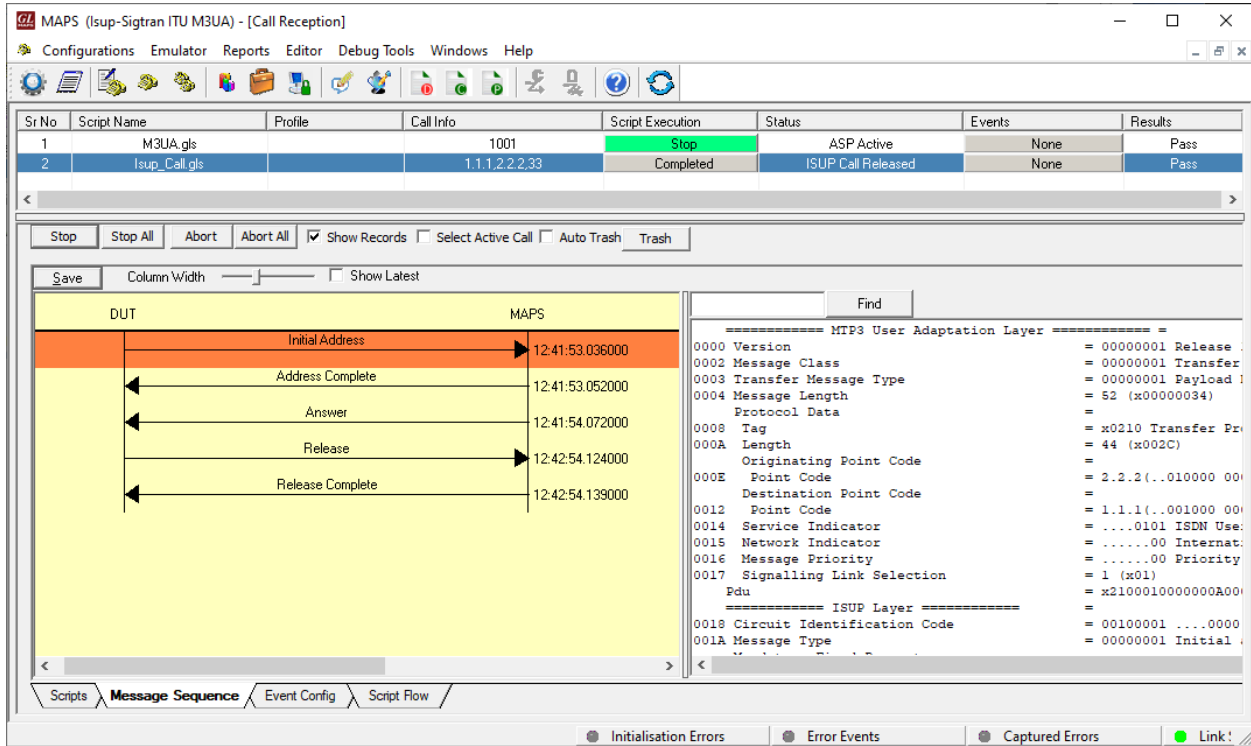
# Call Generation and Call Reception (Contd.)

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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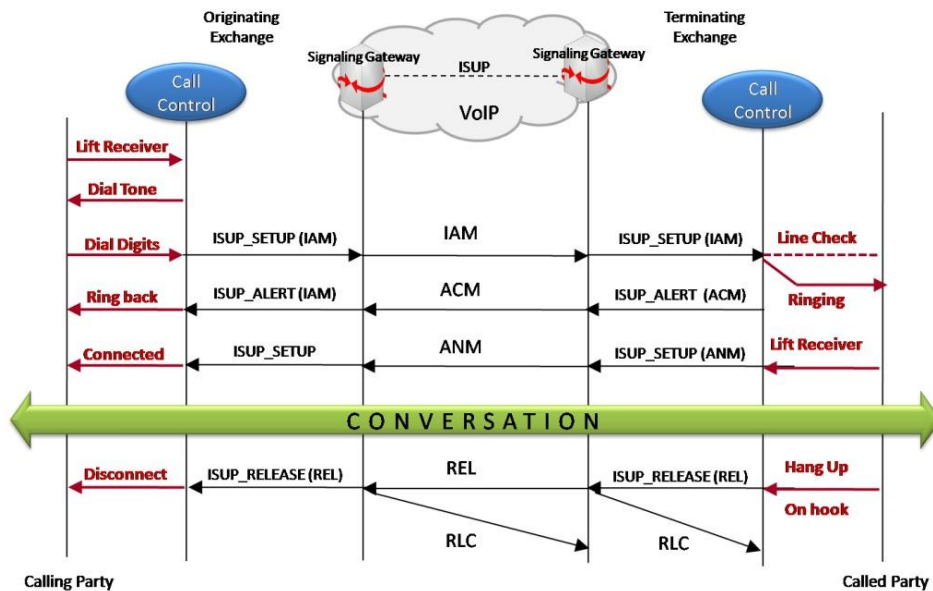
Command Line Interface

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
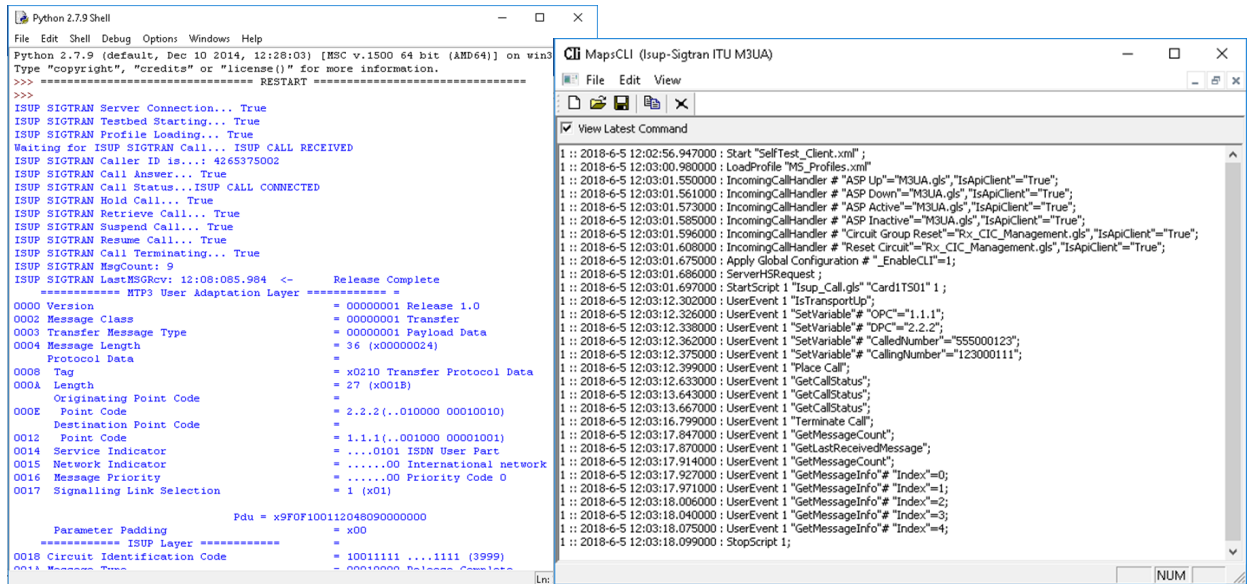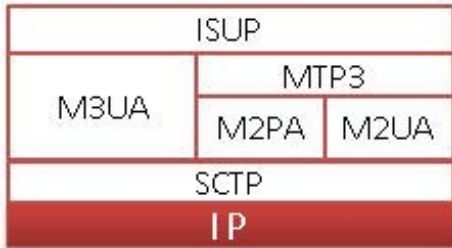

Figure: MAPS CLI Server and Python client sample script

Supported Protocols and Specifications

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

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Buyer's Guide

Item No	Product Description
PKS130	MAPS™ SIGTRAN Emulator

Item No	Related Software
PKV100	PacketScan™ (Online and Offline)
PKV105	SIGTRAN Analyzer (Optional with PacketScan™)
XX610	w/ Transmit and Receive File capability
XX620	w/ DTMF/MF/MFC-R2 + answer/place call capability
XXFT0	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)
FTE001	QuadXpress T1E1 Main Board (Quad Port– requires additional licenses)
ETE001	OctalXpress T1E1 Main Board plus Daughter Board (Octal Port– requires additional licenses)

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

For more information, please visit Signaling and Traffic Simulator webpage.