MAPS™ SIP-I Emulator

SIP-ISUP Emulation over IP

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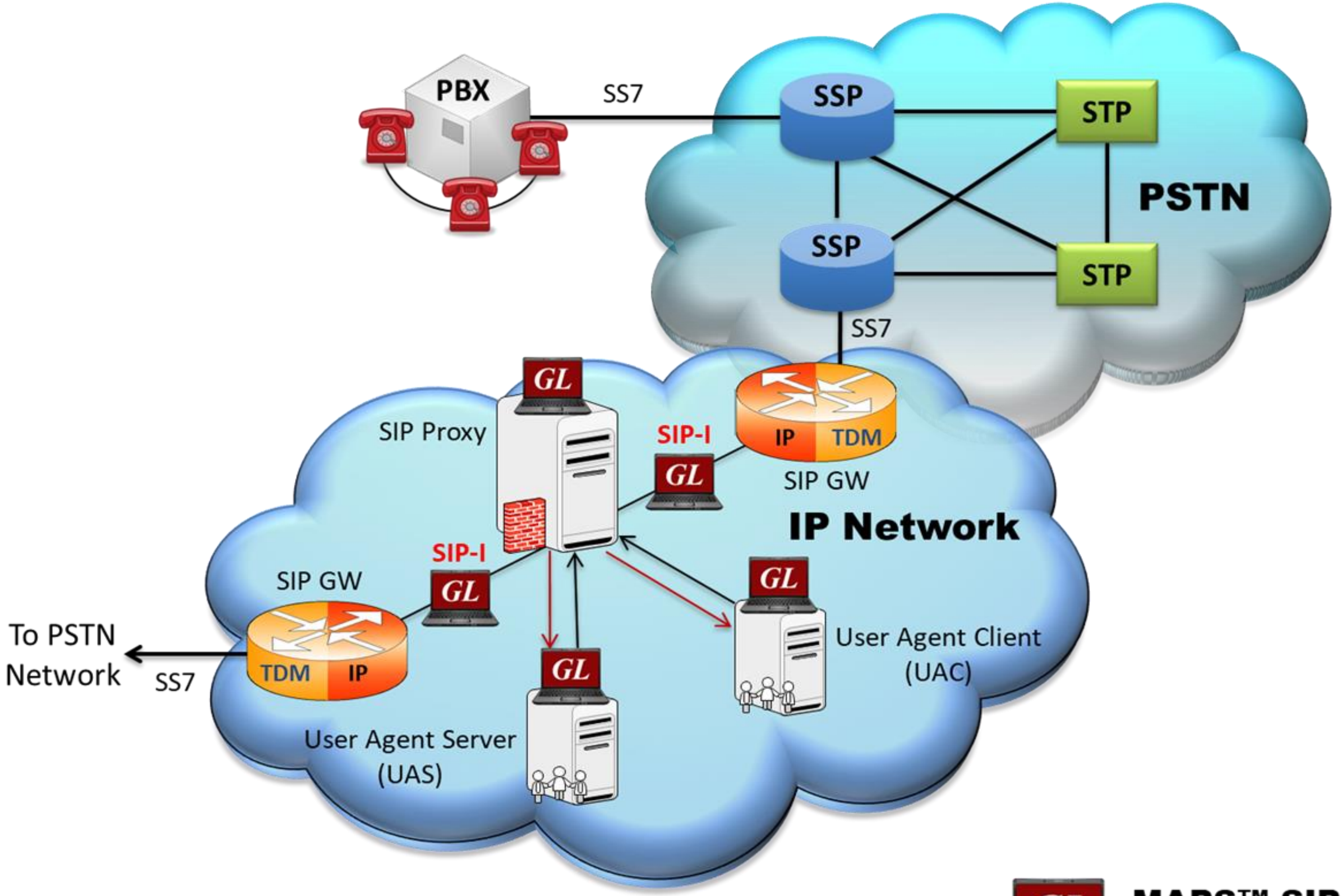
Overview



MAPS™ SIP-I Emulator
(SIP-I and SIP-T Protocol Emulation)

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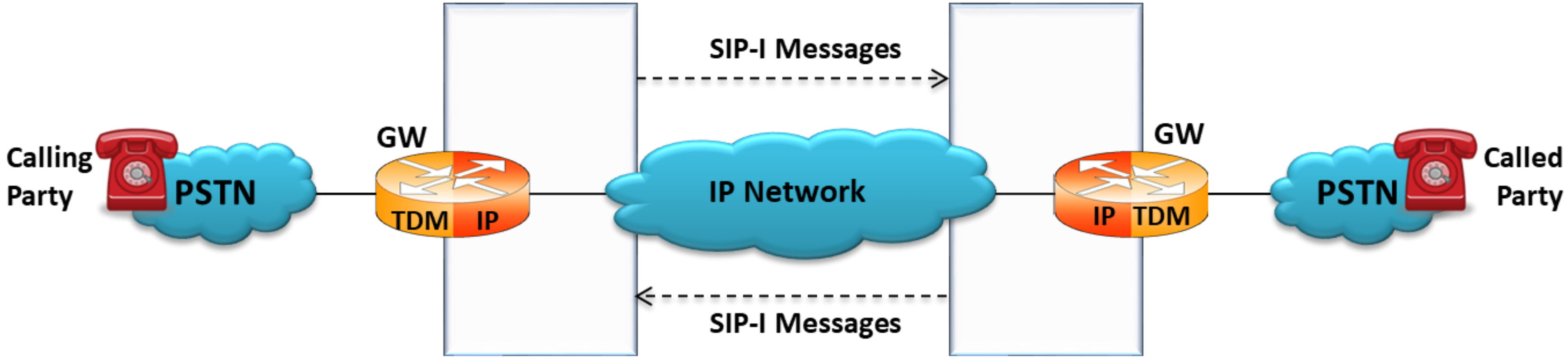
MAPS™ SIP-I



SIP-I Messages
Calling Party
PSTN
GW
TDM
IP
IP Network
GW
IP
TDM
PSTN
Called Party
SIP-I Messages

Protocol Specific Features

Signaling	• Supports both UDP and TCP (Ipv4 and Ipv6) • Generates and processes SIP-I valid and invalid messages • Each SIP-I message template facilitates customization of the protocol fields and access to the various protocol fields from the scripts • Handles Retransmissions and Remote Retransmissions • Supports Call hold, Call redirect, Bind Call Transfer, auto call rejection, and silence packets generation
Traffic	• Supports transmission and detection of various RTP traffic such as, digits, voice file, Fax, IVR, single tone, and dual tones in IP networks • Supports Secure Real-time Transport Protocol (or SRTP) traffic initialized over TLS (Transport Layer Security) or SSL (OpenSSL) • Supports both RTP G.711 Pass Through Fax Simulation and T.38 Fax Simulation over UDPTL • RTP Voice Traffic Generation used in conjunction with SIP Signaling • User-defined global statistics for received RTP audio quality metrics are updated periodically on run time • Bulk Video Call Generation supported with H.264 and H.263 video codecs • Supports almost all industry standard codec types
Applications	• Simulates Signaling Gateway, Softswitch with SIP-I (Profile C) support to test interworking of PSTN services over IP networks • Fully integrated, complete test environment for SIP-I or SIP-T • Inter-operability testing of networks

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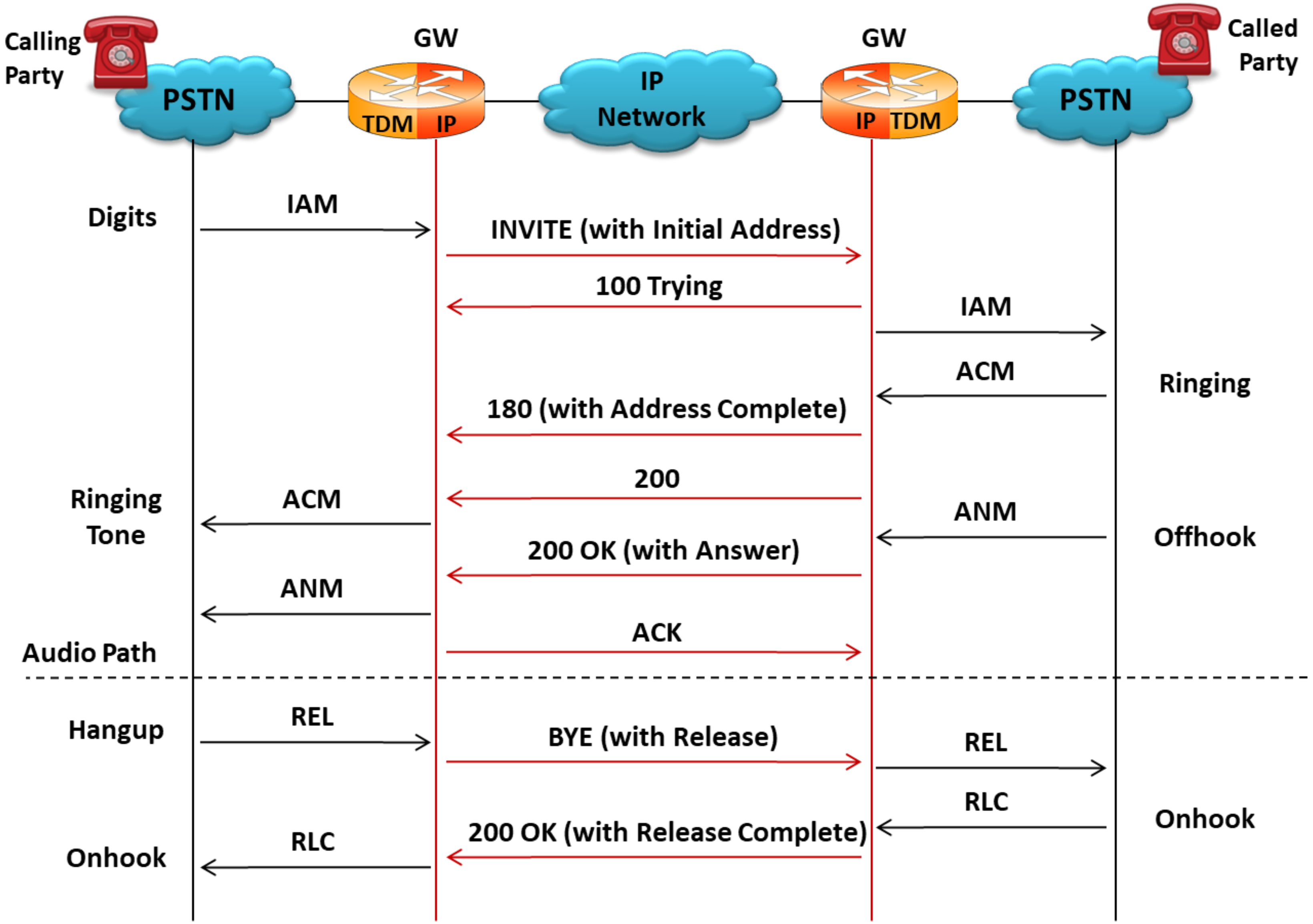
Protocol Specific Standards

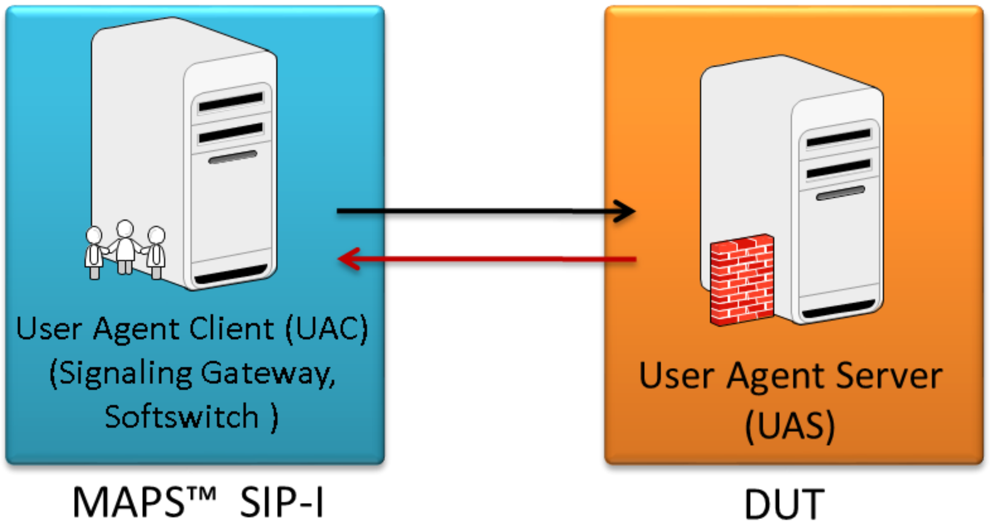
Available Standards	Standard / Specification Used
SIP-I (Profile-C)	ITU Q.1912.5 - Interworking between Session Initiation Protocol (SIP) and ISDN User Part ND1007:2001/07, PNO-ISC/SPEC/007- Interworking between Session Initiation Protocol (SIP) and UK ISDN User Part (UK ISUP)
SIP-T	IETF RFC 3372

Typical SIP-I Call Procedure

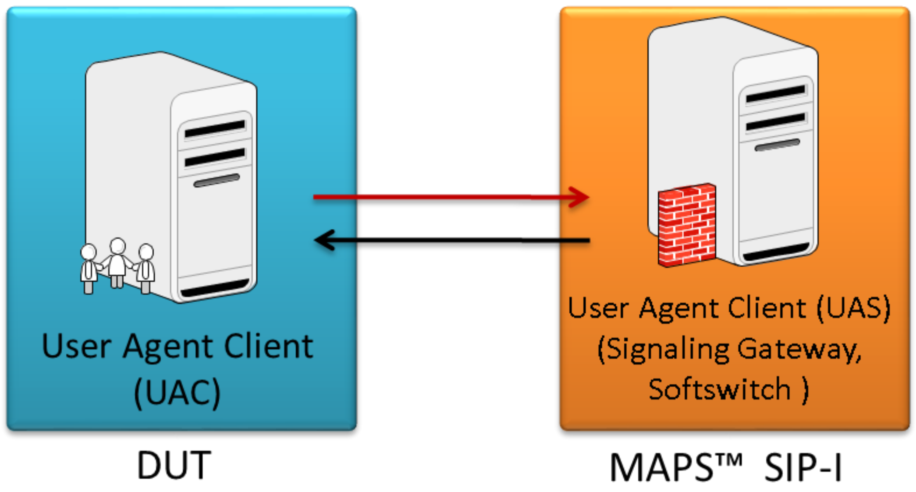


Test Scenarios

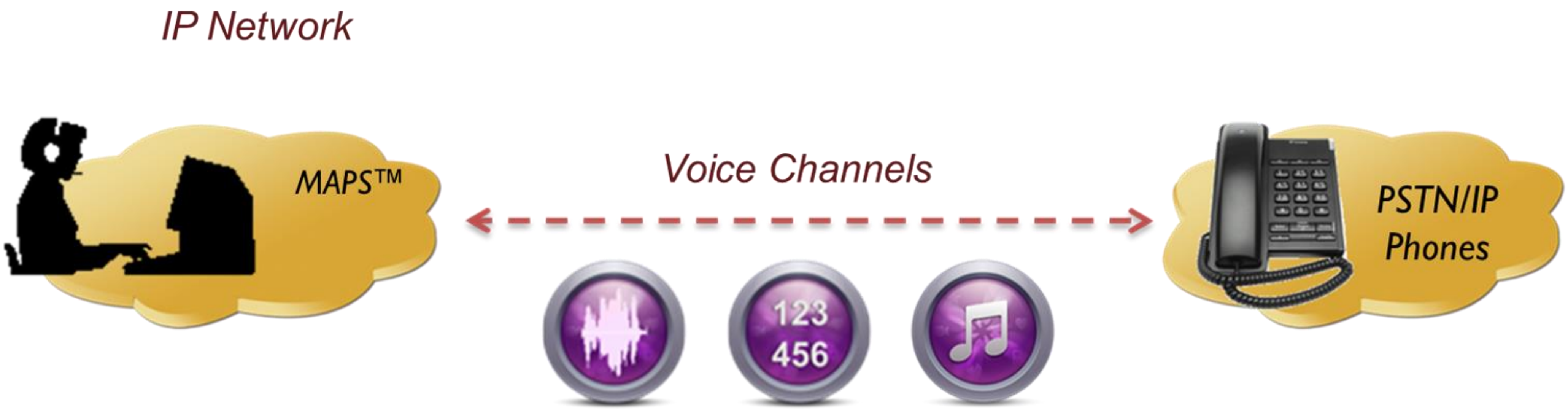
MAPS™ SIP-I simulating UAC and testing UAS (DUT)



MAPS™ SIP-I simulating UAS and testing UAC (DUT)



RTP Traffic Simulation



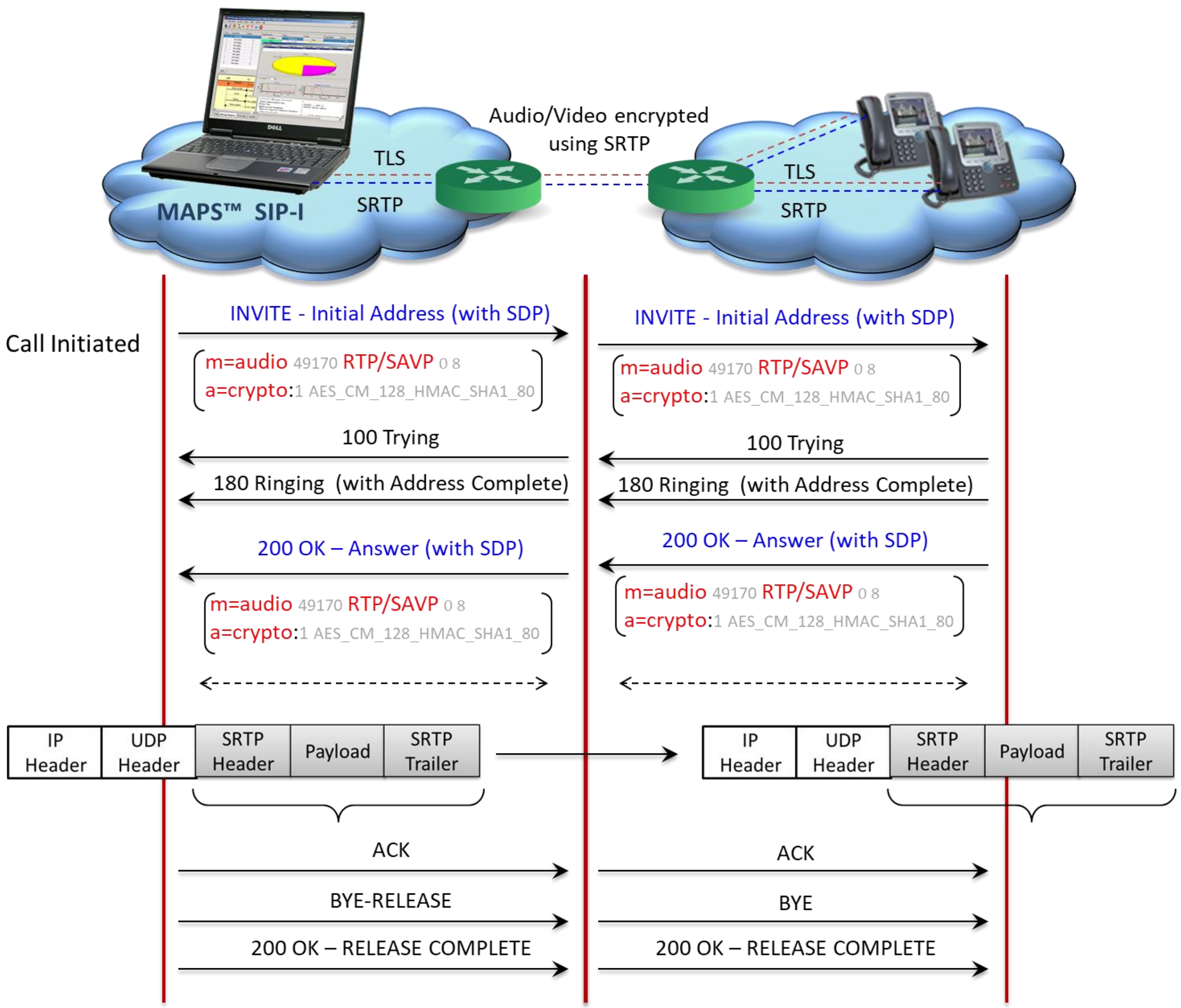
Tx

- Pre recorded GLW files
- DTMF, MF Digits
- User Defined Tones
- Insert Voice
- FAX T.30

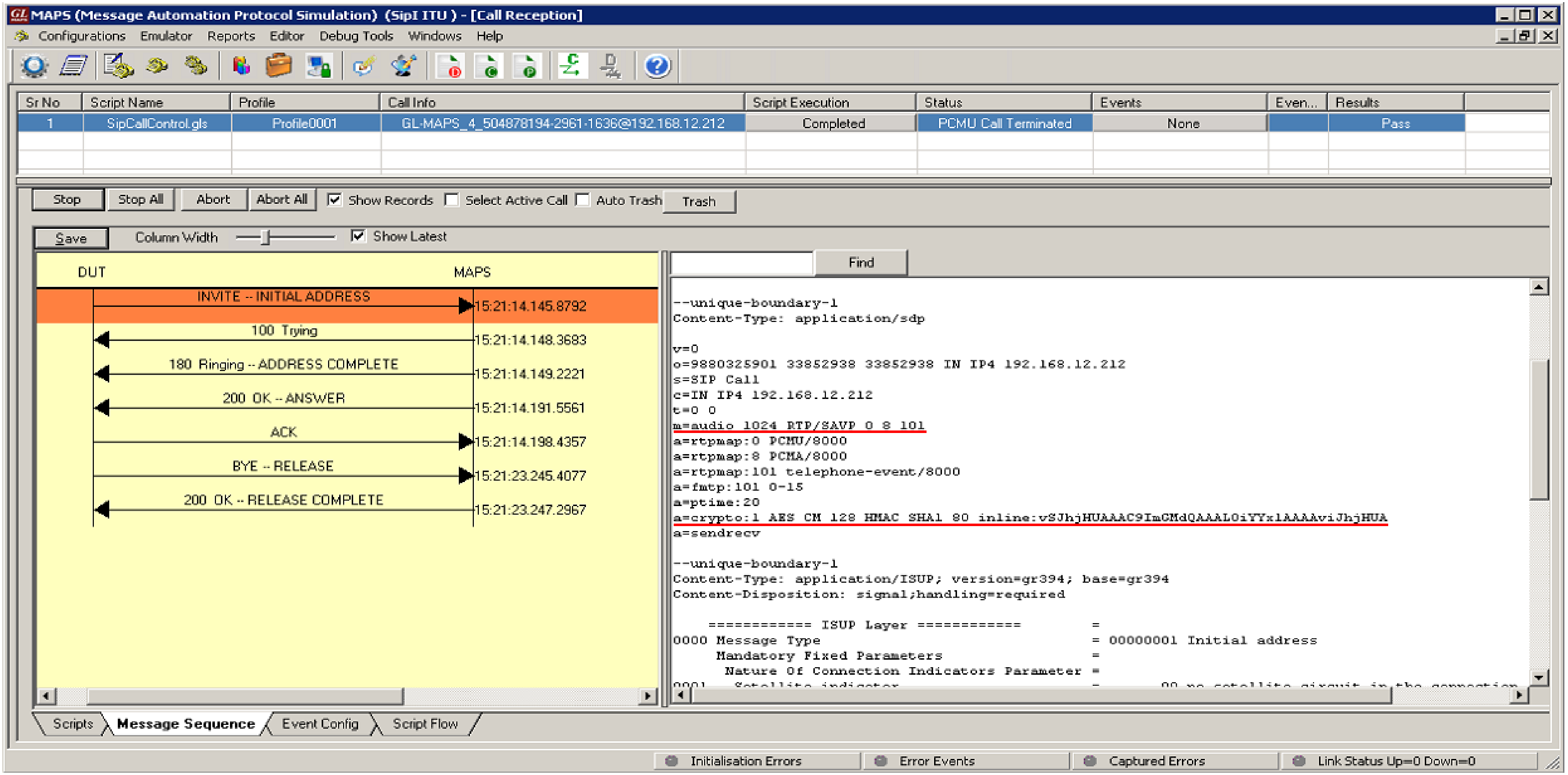
Rx

- GLW files
- DTMF, MF Digits
- User Defined Tones
- FAX T.30

Secured RTP Traffic Simulation



Secured RTP Traffic Simulation



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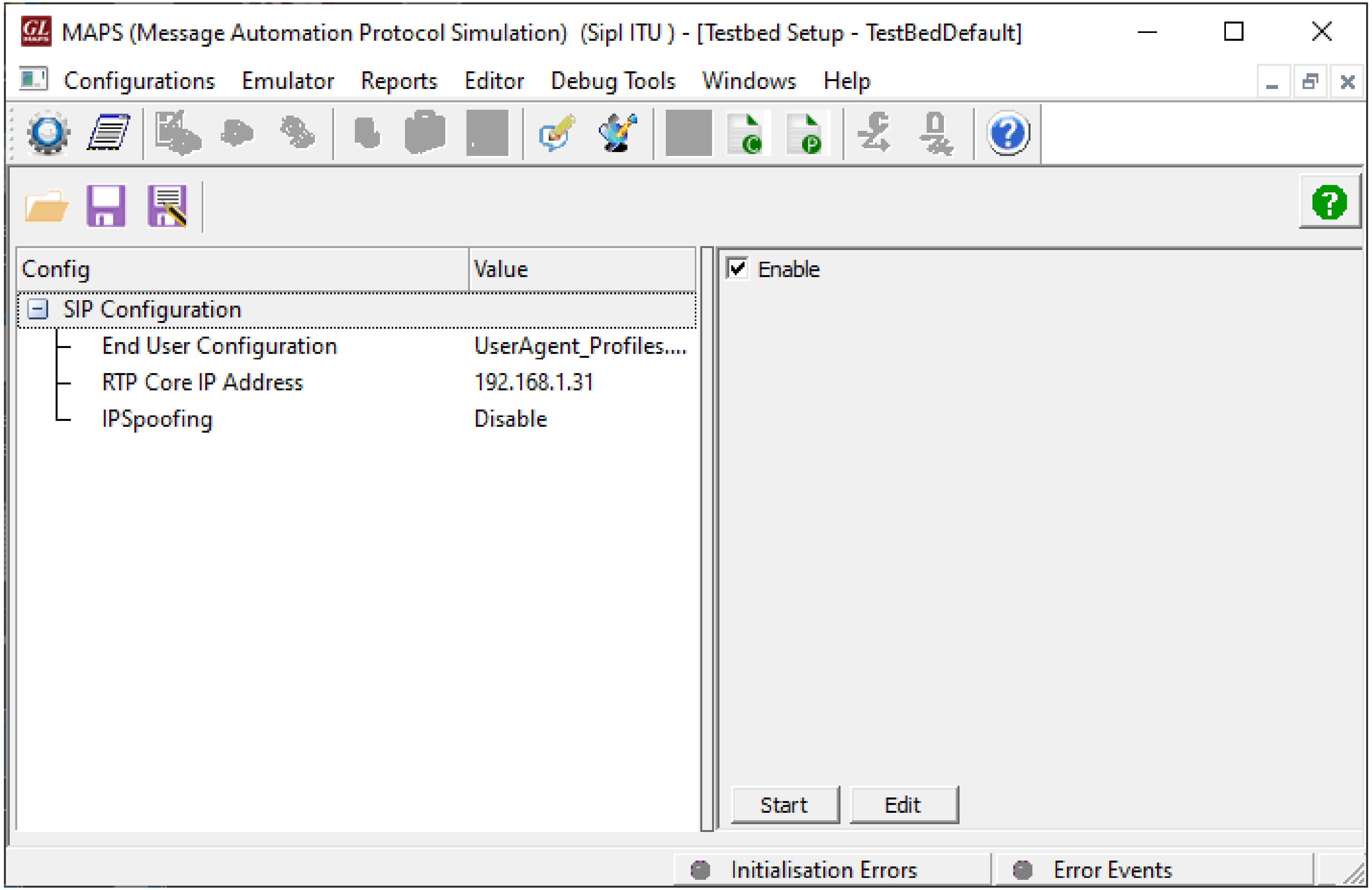
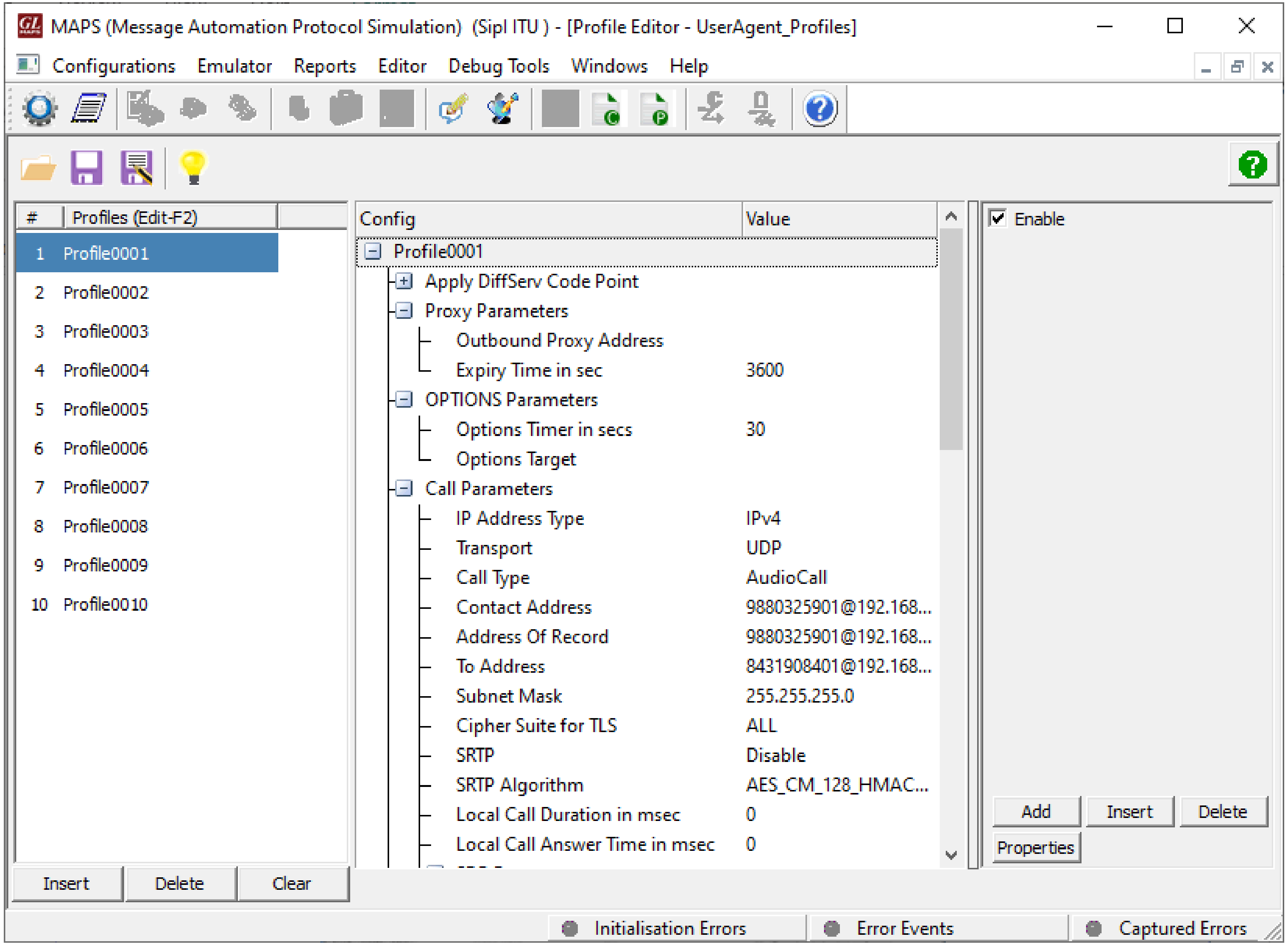
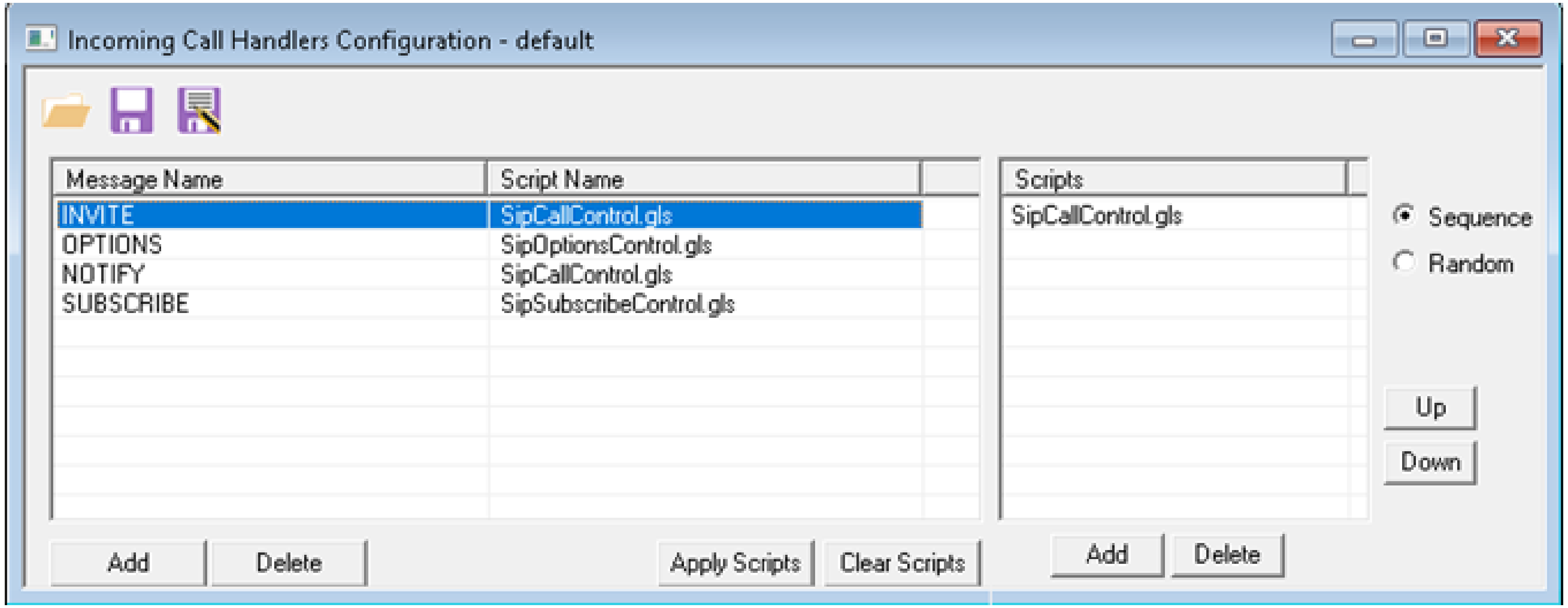
Testbed Configuration



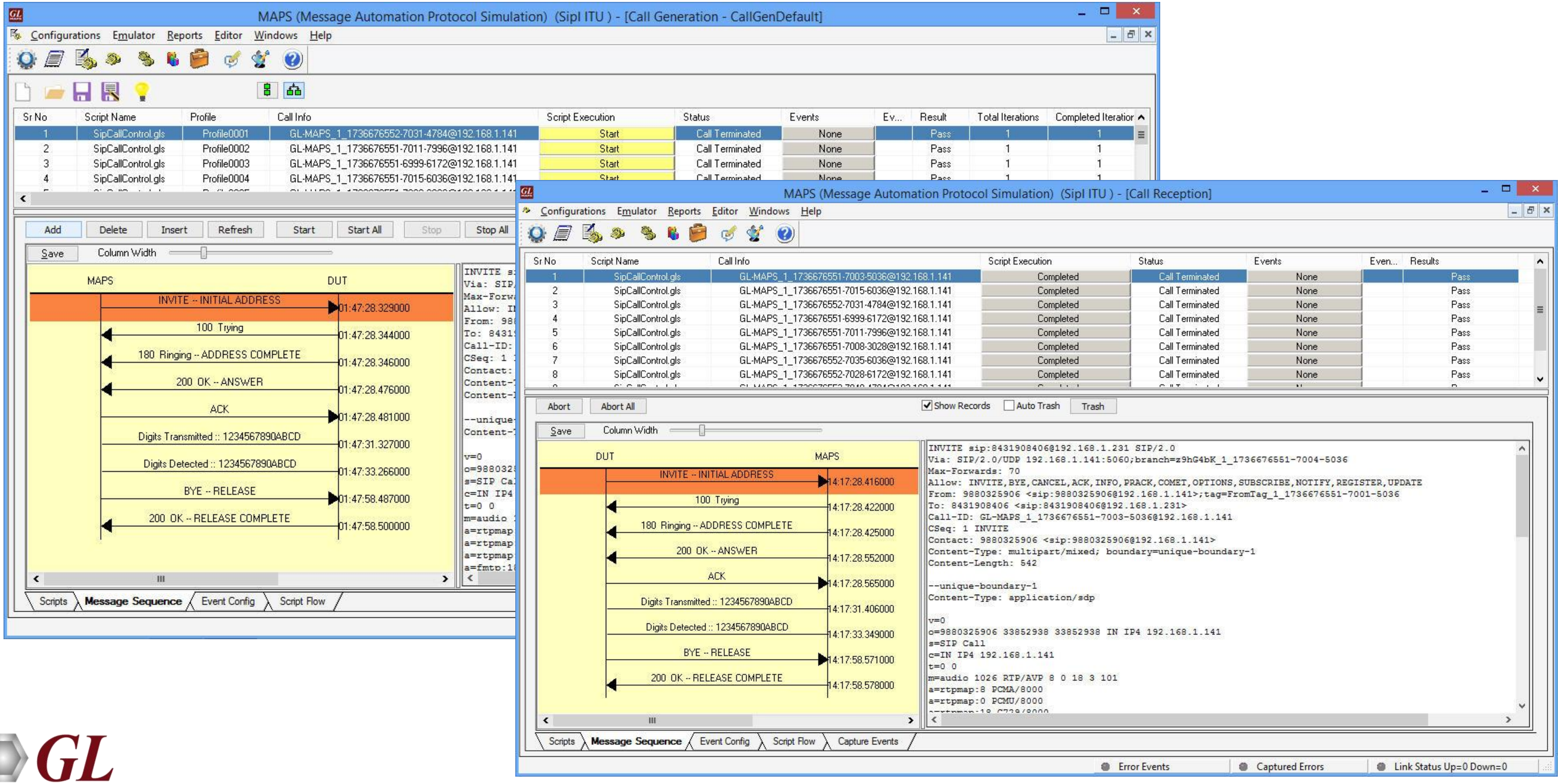
Profile Configuration



Incoming Call Handler Configuration



Call Generation and Reception



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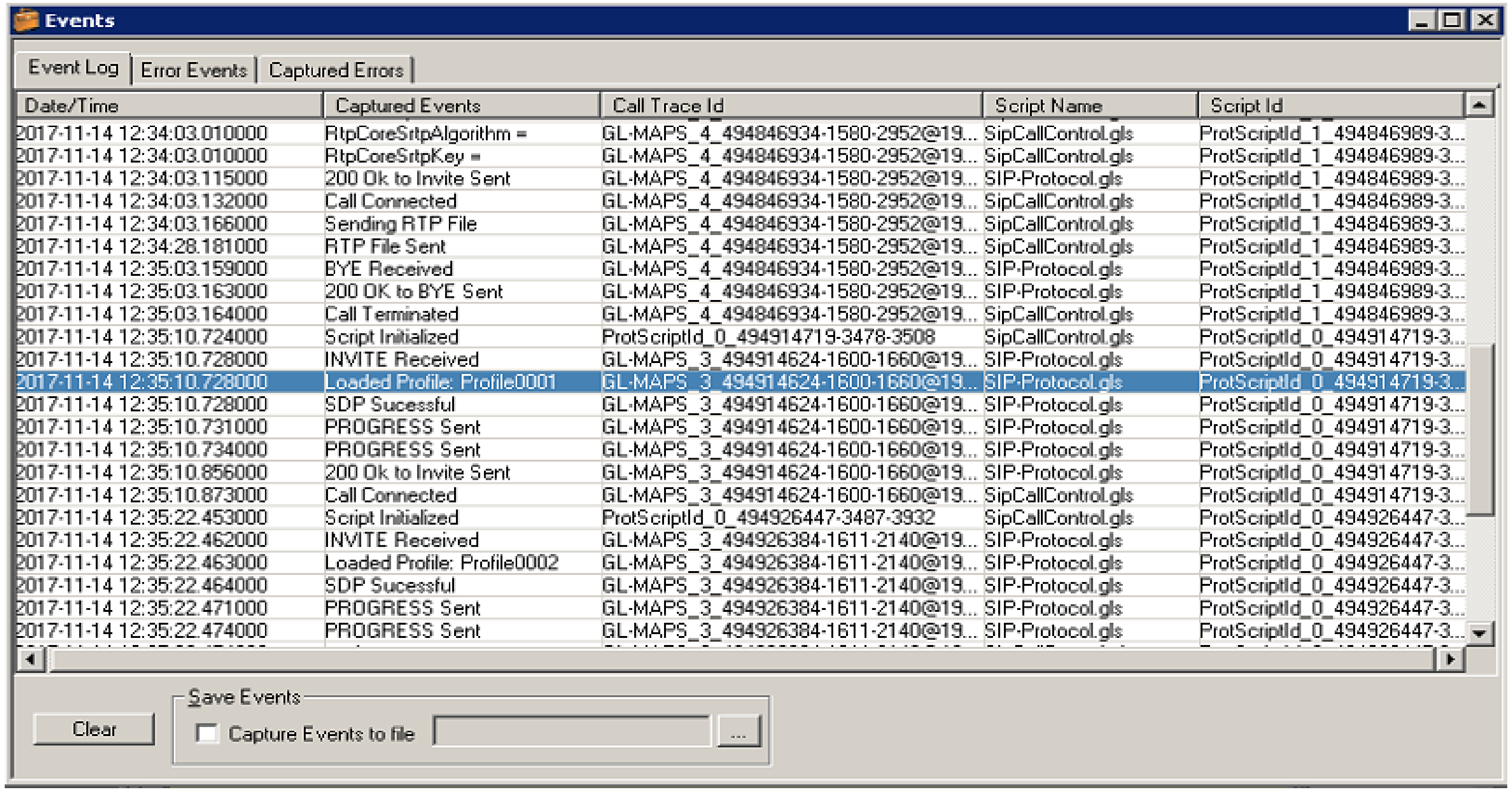
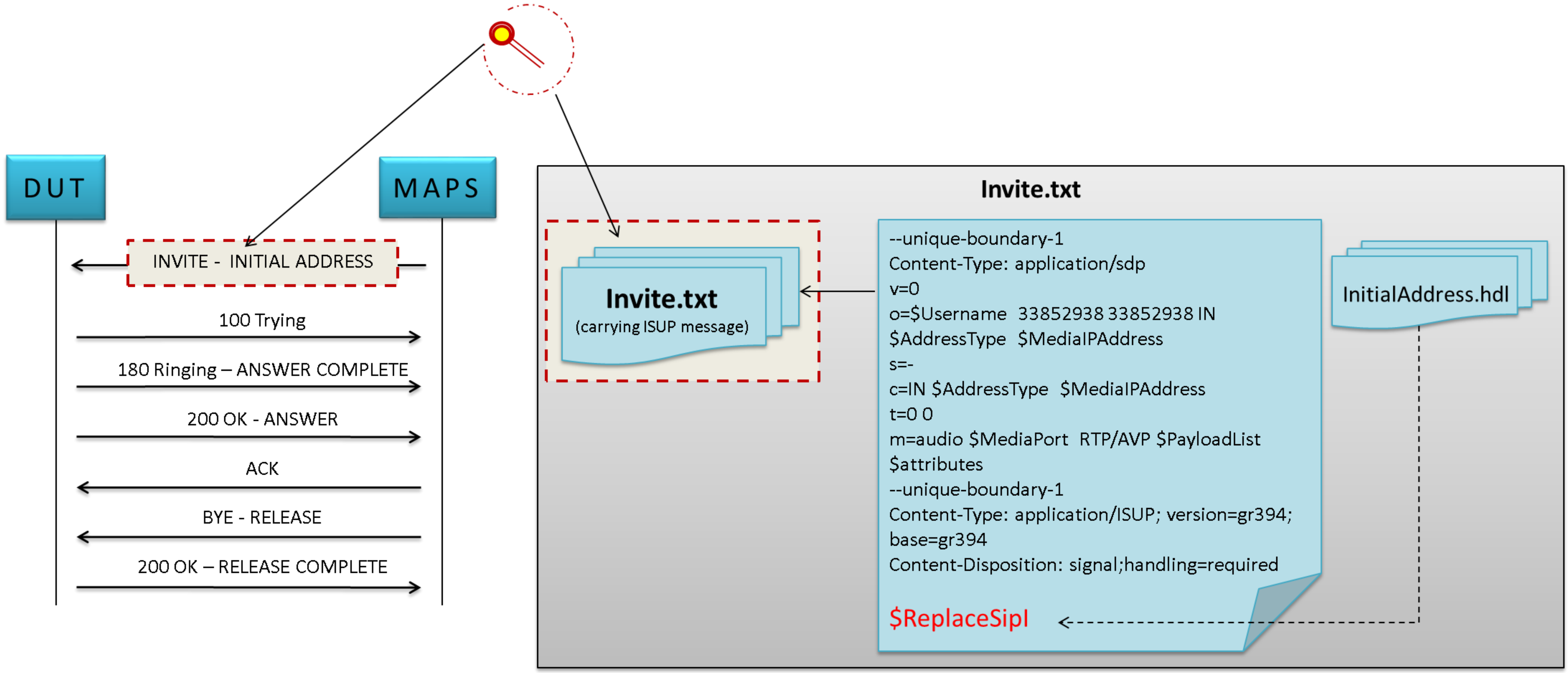
Event Log



Date/Time	Captured Events	Call Trace Id	Script Name	Script Id
2017-11-14 12:34:03.010000	RtpCoreSrtpAlgorithm =	GL-MAPS_4_494846934-1580-2952@19...	SipCallControl.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:34:03.010000	RtpCoreSrtpKey =	GL-MAPS_4_494846934-1580-2952@19...	SipCallControl.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:34:03.115000	200 Ok to Invite Sent	GL-MAPS_4_494846934-1580-2952@19...	SIP-Protocol.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:34:03.132000	Call Connected	GL-MAPS_4_494846934-1580-2952@19...	SipCallControl.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:34:03.166000	Sending RTP File	GL-MAPS_4_494846934-1580-2952@19...	SipCallControl.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:34:28.181000	RTP File Sent	GL-MAPS_4_494846934-1580-2952@19...	SipCallControl.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:35:03.159000	BYE Received	GL-MAPS_4_494846934-1580-2952@19...	SIP-Protocol.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:35:03.163000	200 OK to BYE Sent	GL-MAPS_4_494846934-1580-2952@19...	SIP-Protocol.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:35:03.164000	Call Terminated	GL-MAPS_4_494846934-1580-2952@19...	SipCallControl.gls	ProtScriptId_1_494846989-3...
2017-11-14 12:35:10.724000	Script Initialized	ProtScriptId_0_494914719-3478-3508	SipCallControl.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.728000	INVITE Received	GL-MAPS_3_494914624-1600-1660@19...	SIP-Protocol.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.728000	Loaded Profile: Profile0001	GL-MAPS_3_494914624-1600-1660@19...	SIP-Protocol.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.728000	SDP Sucessful	GL-MAPS_3_494914624-1600-1660@19...	SIP-Protocol.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.731000	PROGRESS Sent	GL-MAPS_3_494914624-1600-1660@19...	SIP-Protocol.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.734000	PROGRESS Sent	GL-MAPS_3_494914624-1600-1660@19...	SIP-Protocol.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.856000	200 Ok to Invite Sent	GL-MAPS_3_494914624-1600-1660@19...	SIP-Protocol.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:10.873000	Call Connected	GL-MAPS_3_494914624-1600-1660@19...	SipCallControl.gls	ProtScriptId_0_494914719-3...
2017-11-14 12:35:22.453000	Script Initialized	ProtScriptId_0_494926447-3487-3932	SipCallControl.gls	ProtScriptId_0_494926447-3...
2017-11-14 12:35:22.462000	INVITE Received	GL-MAPS_3_494926384-1611-2140@19...	SIP-Protocol.gls	ProtScriptId_0_494926447-3...
2017-11-14 12:35:22.463000	Loaded Profile: Profile0002	GL-MAPS_3_494926384-1611-2140@19...	SIP-Protocol.gls	ProtScriptId_0_494926447-3...
2017-11-14 12:35:22.464000	SDP Sucessful	GL-MAPS_3_494926384-1611-2140@19...	SIP-Protocol.gls	ProtScriptId_0_494926447-3...
2017-11-14 12:35:22.471000	PROGRESS Sent	GL-MAPS_3_494926384-1611-2140@19...	SIP-Protocol.gls	ProtScriptId_0_494926447-3...
2017-11-14 12:35:22.474000	PROGRESS Sent	GL-MAPS_3_494926384-1611-2140@19...	SIP-Protocol.gls	ProtScriptId_0_494926447-3...

Generating SIP-I Messages

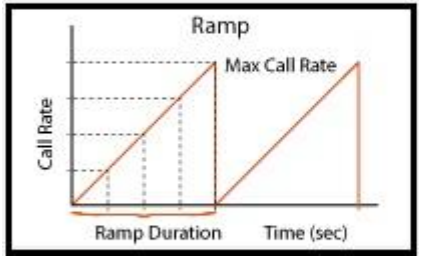


Load Generation

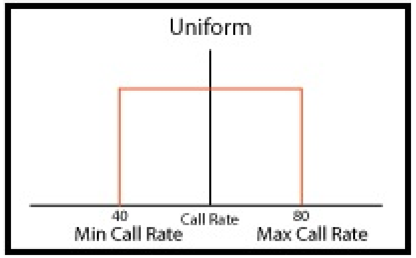
- Stability/Stress and Performance testing using Load Generation
- Different types of Load patterns to distribute load
- User can load multiple patterns for selected script
- User configurable Test Duration, CPS, Maximum and Minimum Call Rate etc.

Fixed

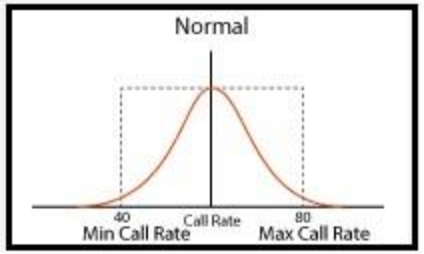
Ramp



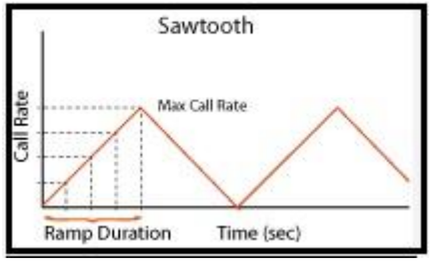
Uniform



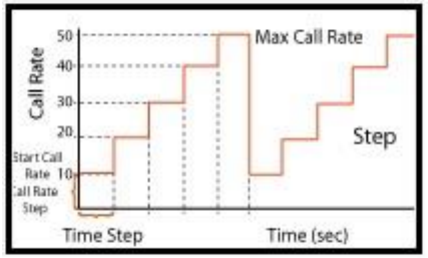
Normal

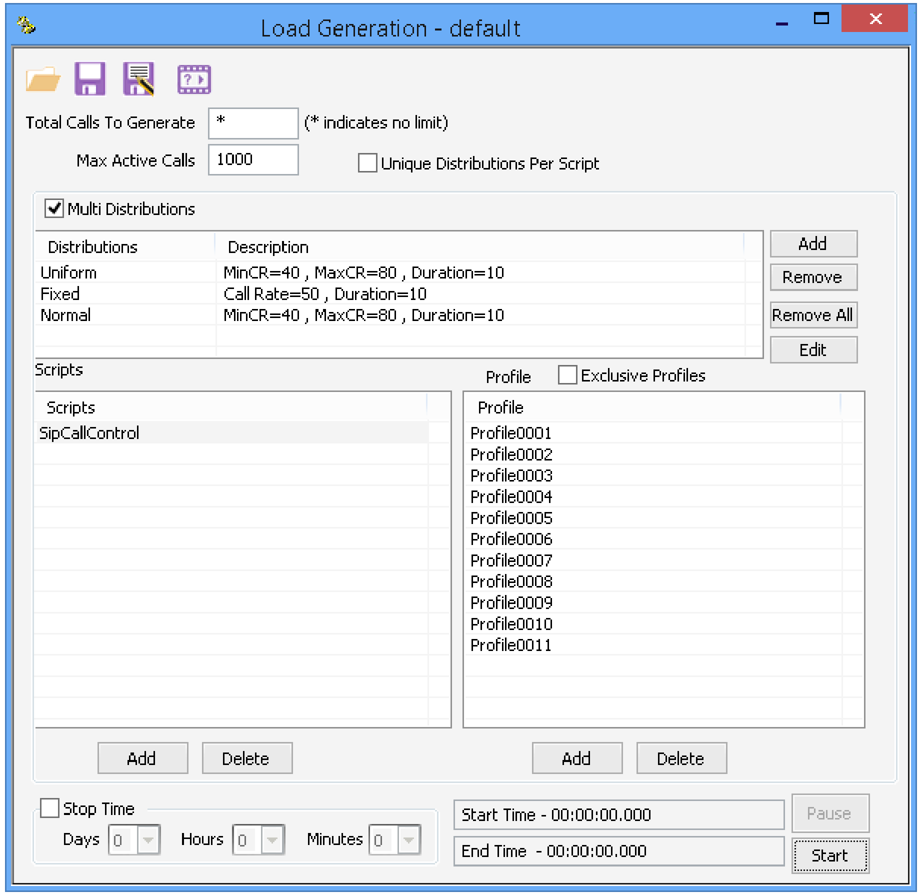


Saw-tooth

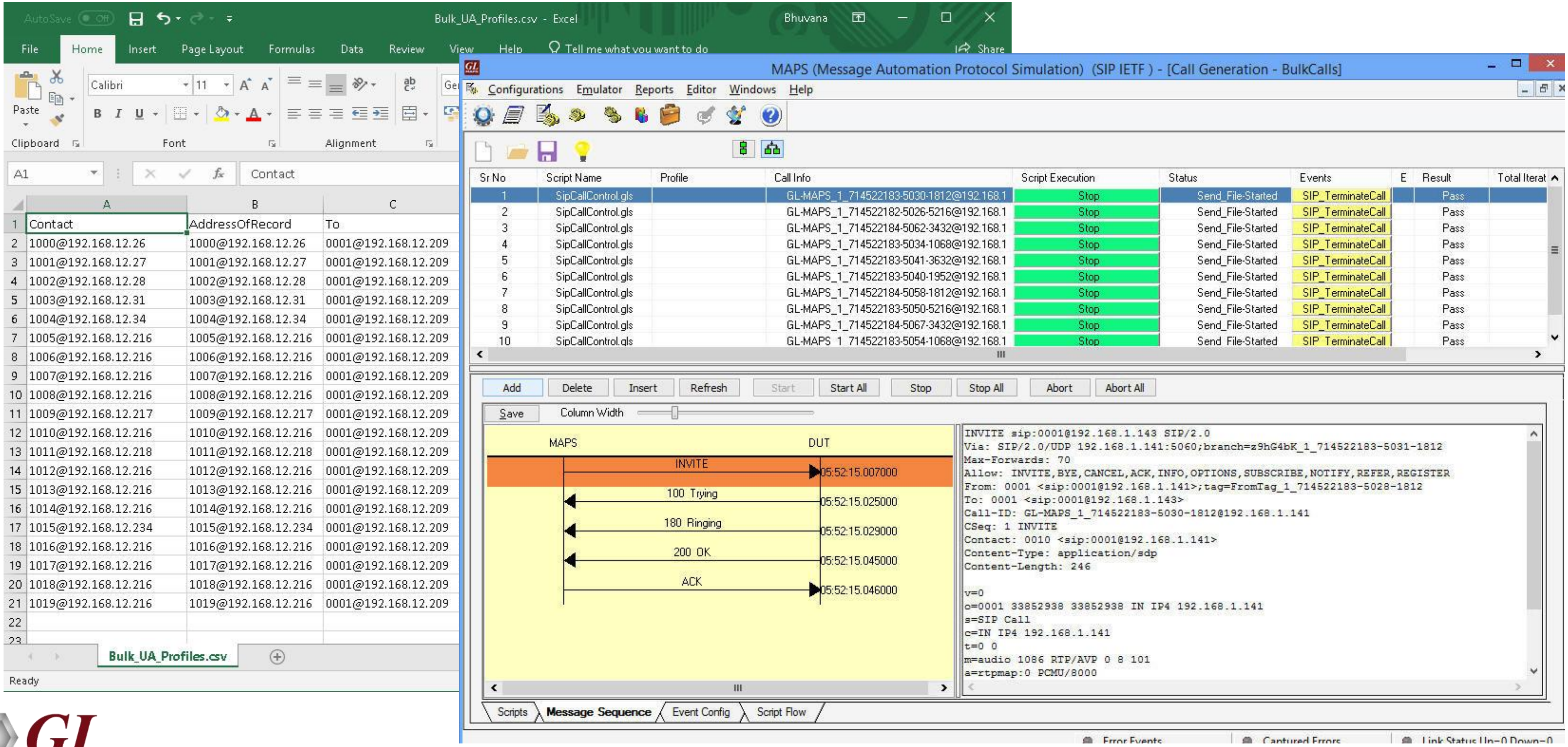


Step





Bulk Call Simulation using CSV File



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Customizations - Statistics and Reports

MOS, R-Factor

Packet Loss

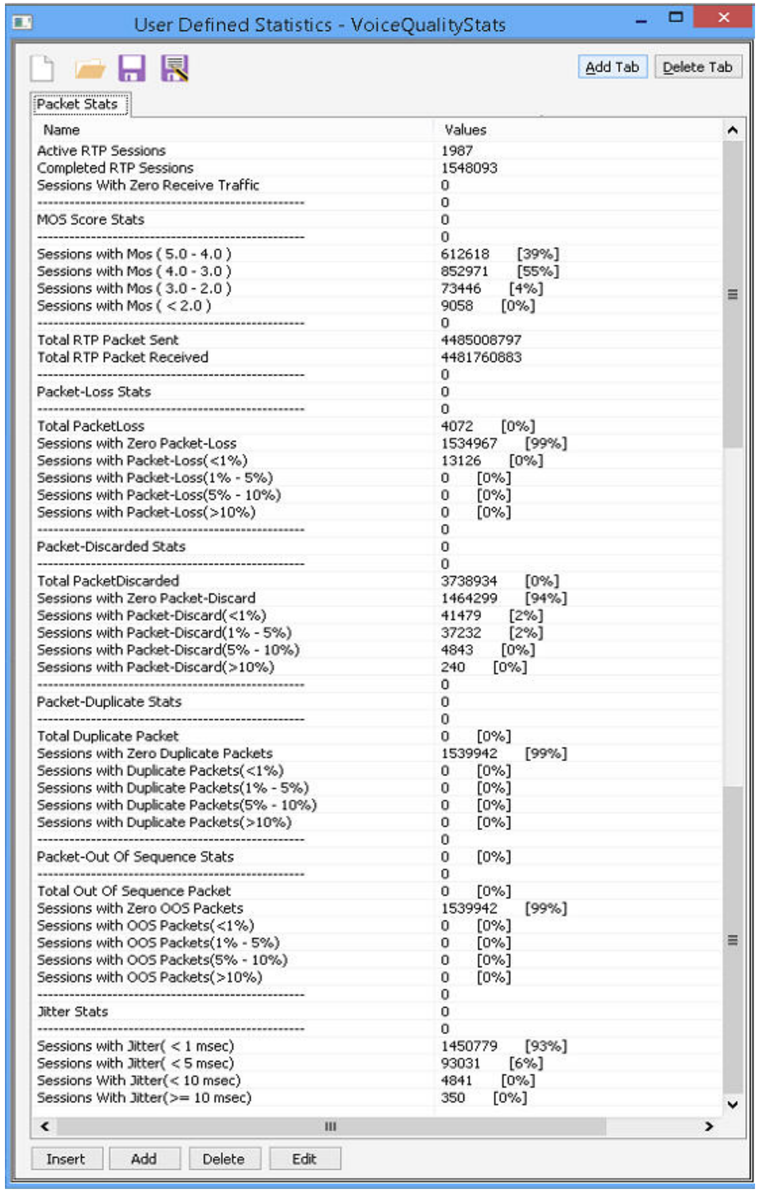
Packets Discarded

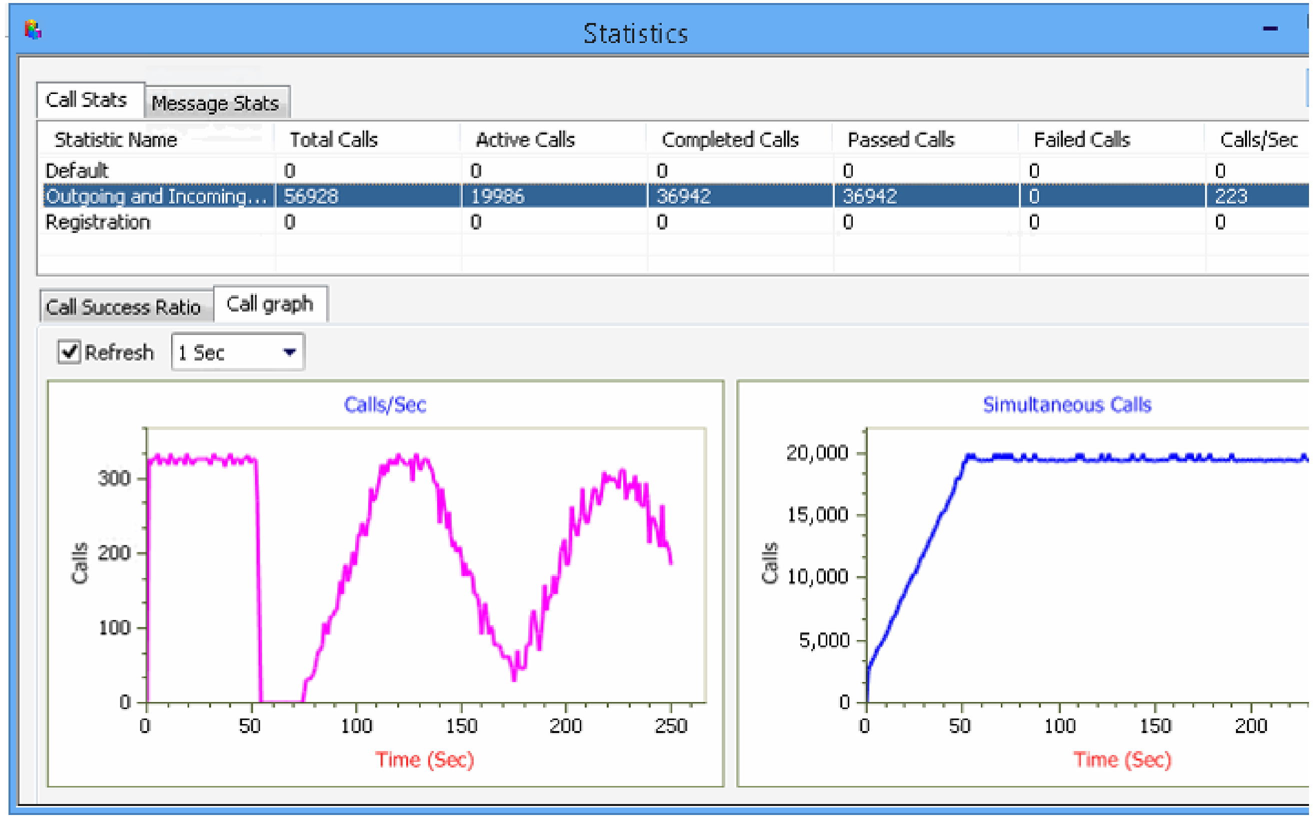
Duplicate Packets

Out-Of-Sequence

Packets

Jitter Statistics





Call Stats provide a running tabular log of system level stats, tracked stats include Total Calls, Active Calls, Completed Calls, Passed Calls, Failed Calls, Instantaneous Calls/Sec

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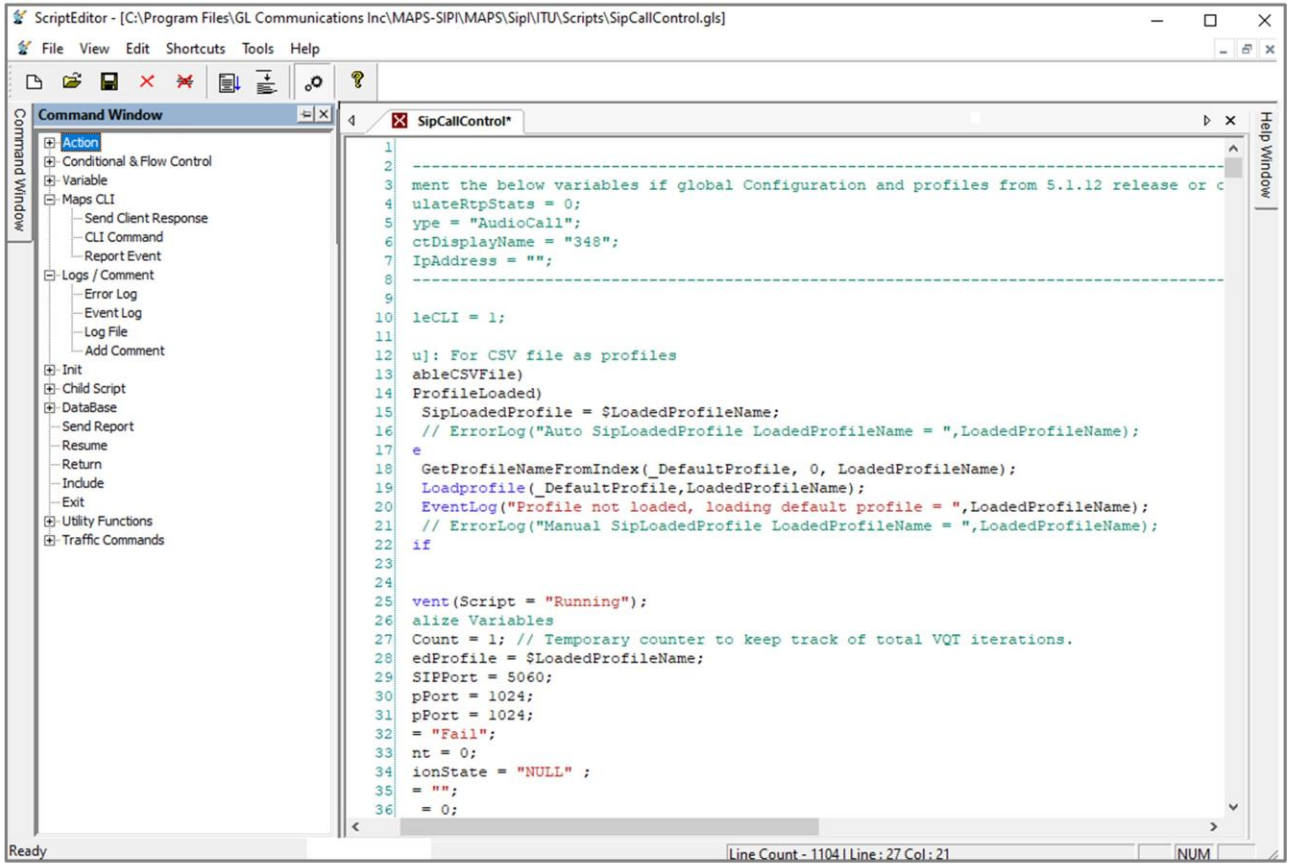
Customizations - Call Flow (Scripts)

- Scripts are written in our proprietary *.gls scripting language. They represent generic state machines intended provide protocol/signaling logic for a call and establish bearer traffic
- Each instance of a script corresponds to a single transaction/call, i.e if you place 500 calls in parallel you will have 500 script instances running at once. If you place 500 calls in series the same script will execute and terminate 500 times
- It is possible to create your own scripts, but almost never necessary! We attempt to provide all necessary scripts out of the box



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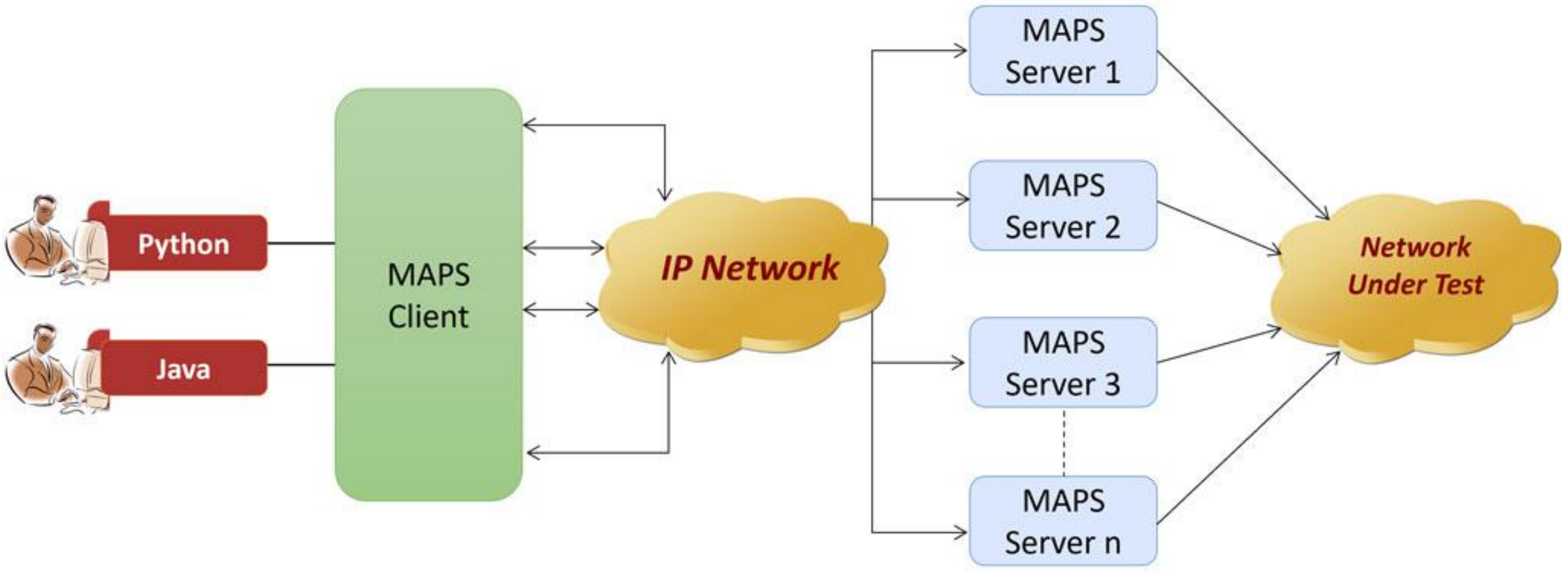
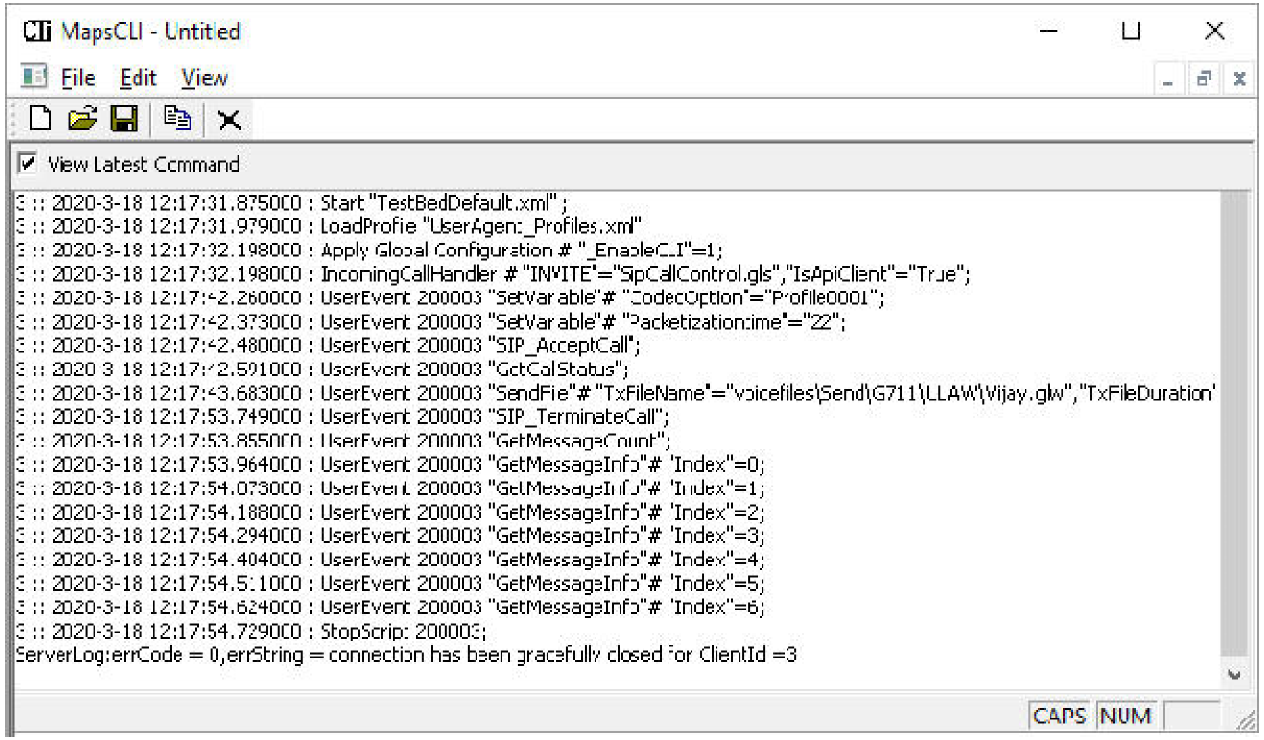
MAPS™ API Architecture

- API wraps our proprietary scripting language in standard languages familiar to the user:
    - Python
    - Java
- Clients and Servers support a "Many-to-Many" relationship, making it very easy for users to develop complex test cases involving multiple signaling protocols

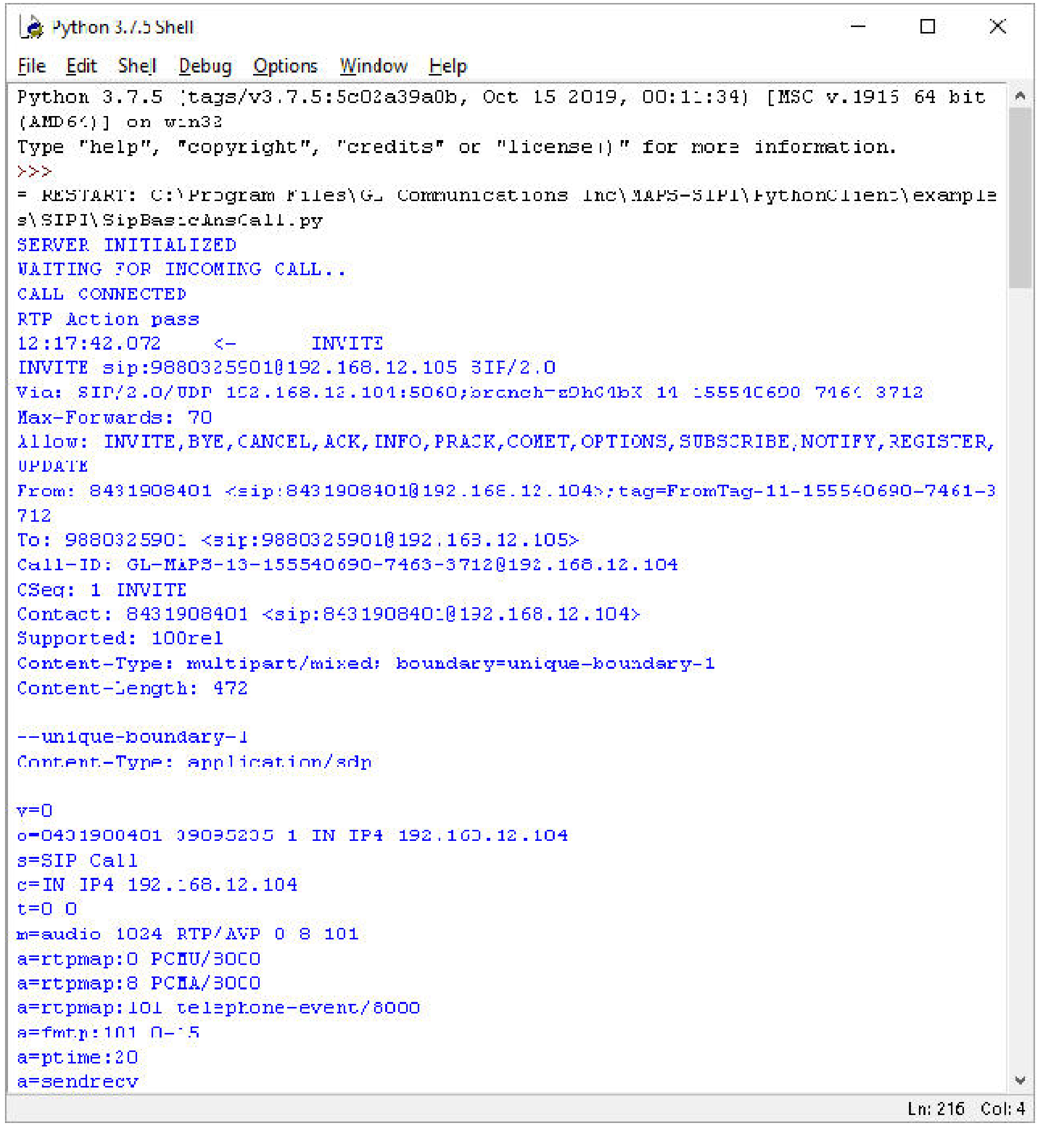


CLI Support

MAPS™ CLI Server



Sample Python CLI Script



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Thank you

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