MAPS™ SS7 Protocol Emulator

(SS7/ISUP Protocol Emulation over TDM/ATM)

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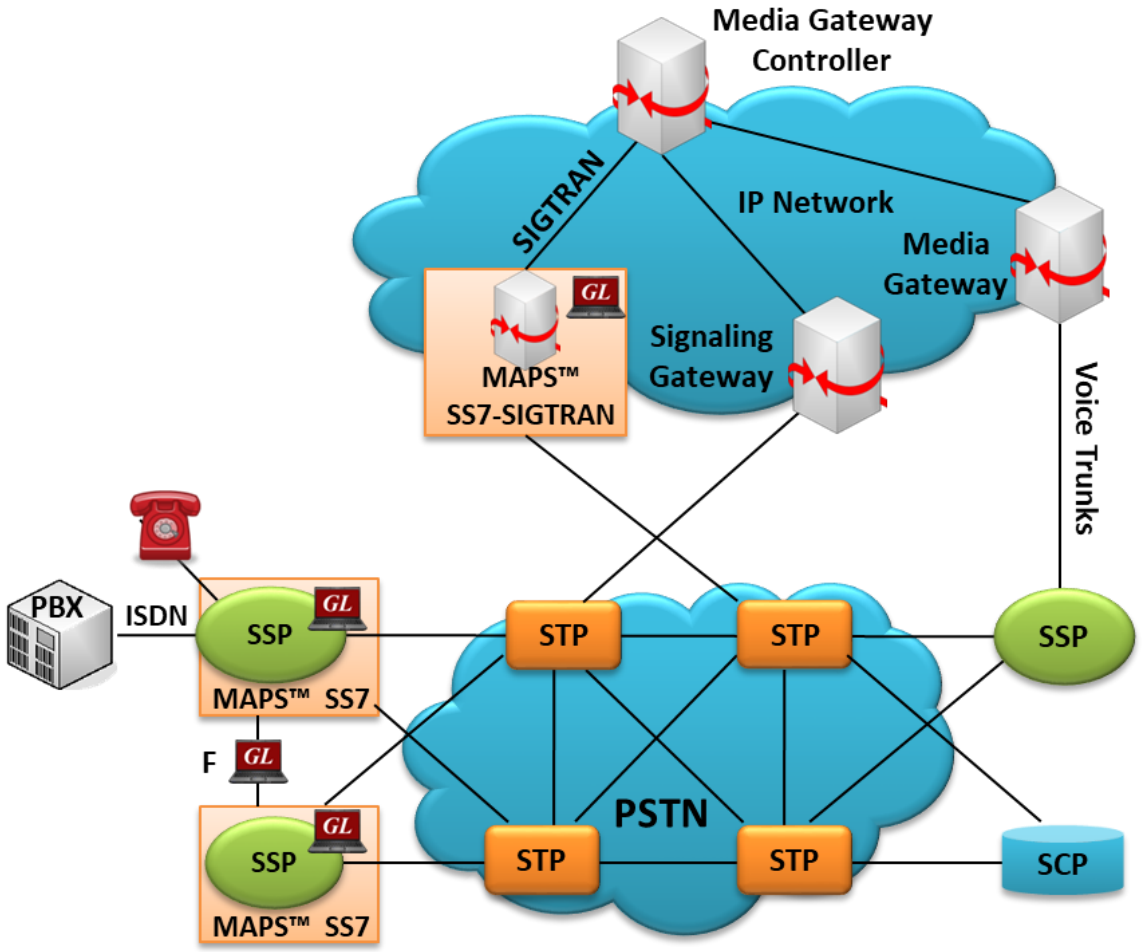
SS7 Network Architecture



MAPS™ SS7 Emulator over TDM/ Network

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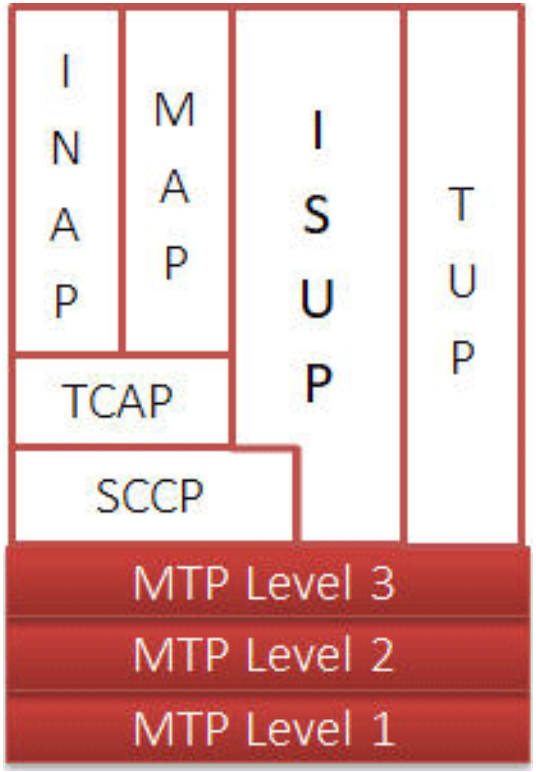
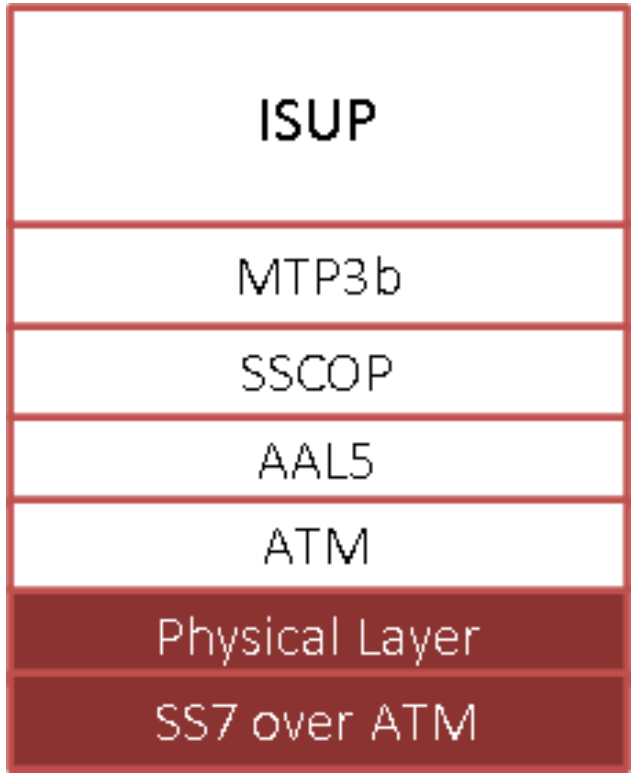
Supported Protocol Standards





Supported Protocols	Standard / Specification Used
TDM	
MTP3 (ITU)	ITU-T Q.704
ISUP (ITU)	ITU - Q.761, Q.762, Q.763 and Q.764
ISUP Conformance testing	ITU - Q.784.1
ISUP CHINA	Ministry of Posts and Telecommunications of the People's Republic of China, Technical Specification of ISUP, 1996
MTP3 (ANSI)	T1.111.4-1996
ISUP (ANSI)	ANSI - T1.113.1 to T1.113.4
Test & Network Management Messages (ITU, China)	ITU-T Q.703, Q.704
Test & Network Management Messages (ANSI)	ANSI T1.111.4, ANSI T1.111.7
ISUP ETSI	EN 300 356 -1 V3.2.2 (1998-08) Part 1
ATM	
ISUP (ITU)	ITU - Q.761, Q.762, Q.763 and Q.764
ATM	ITU-T I.361
SSCOP	ITU-T Q.2110
MTP3b	ITU-T Recommendation Q.2210
AAL5	Class C & D (ITU-T I.363.5)

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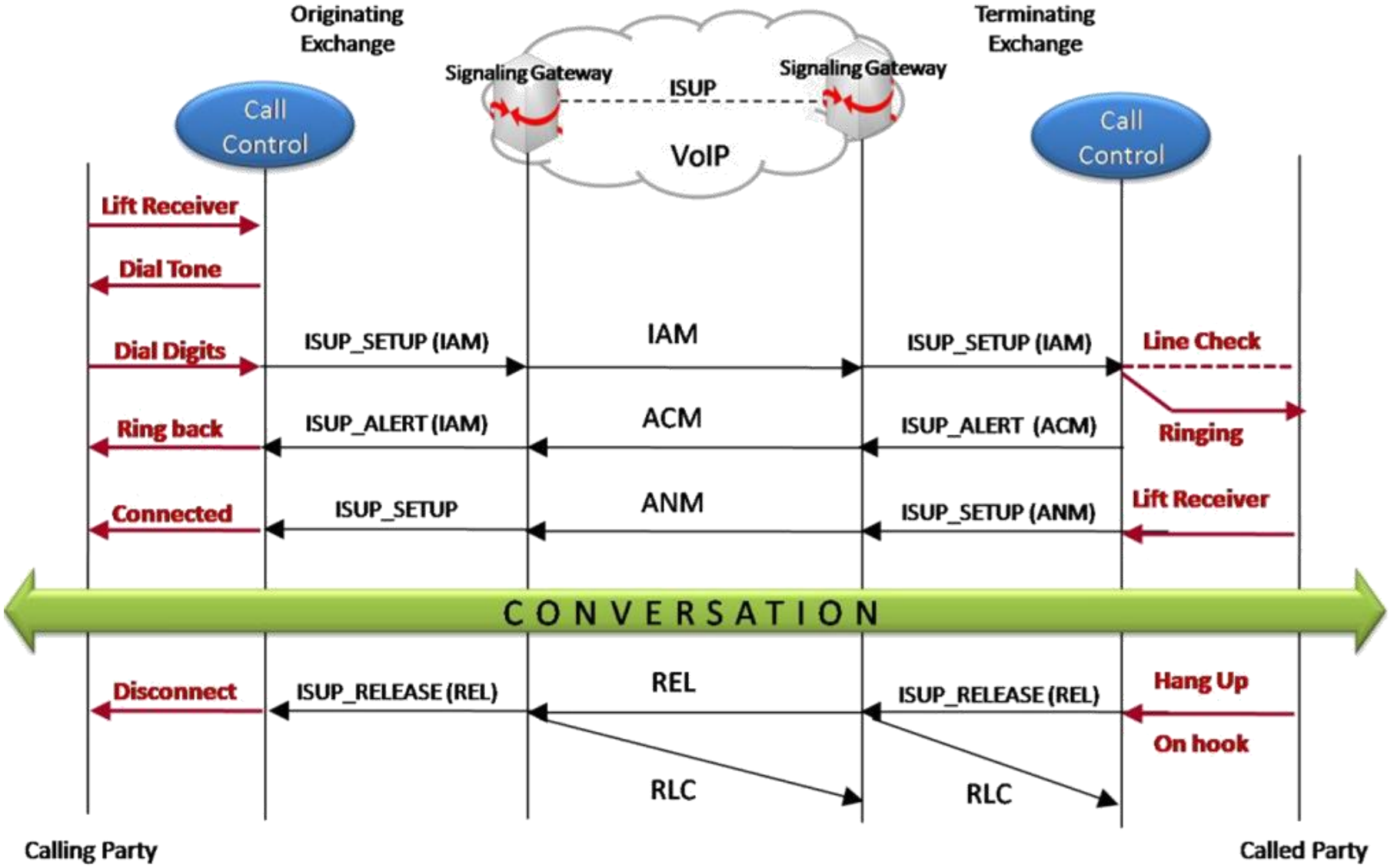
ISUP Call Flow



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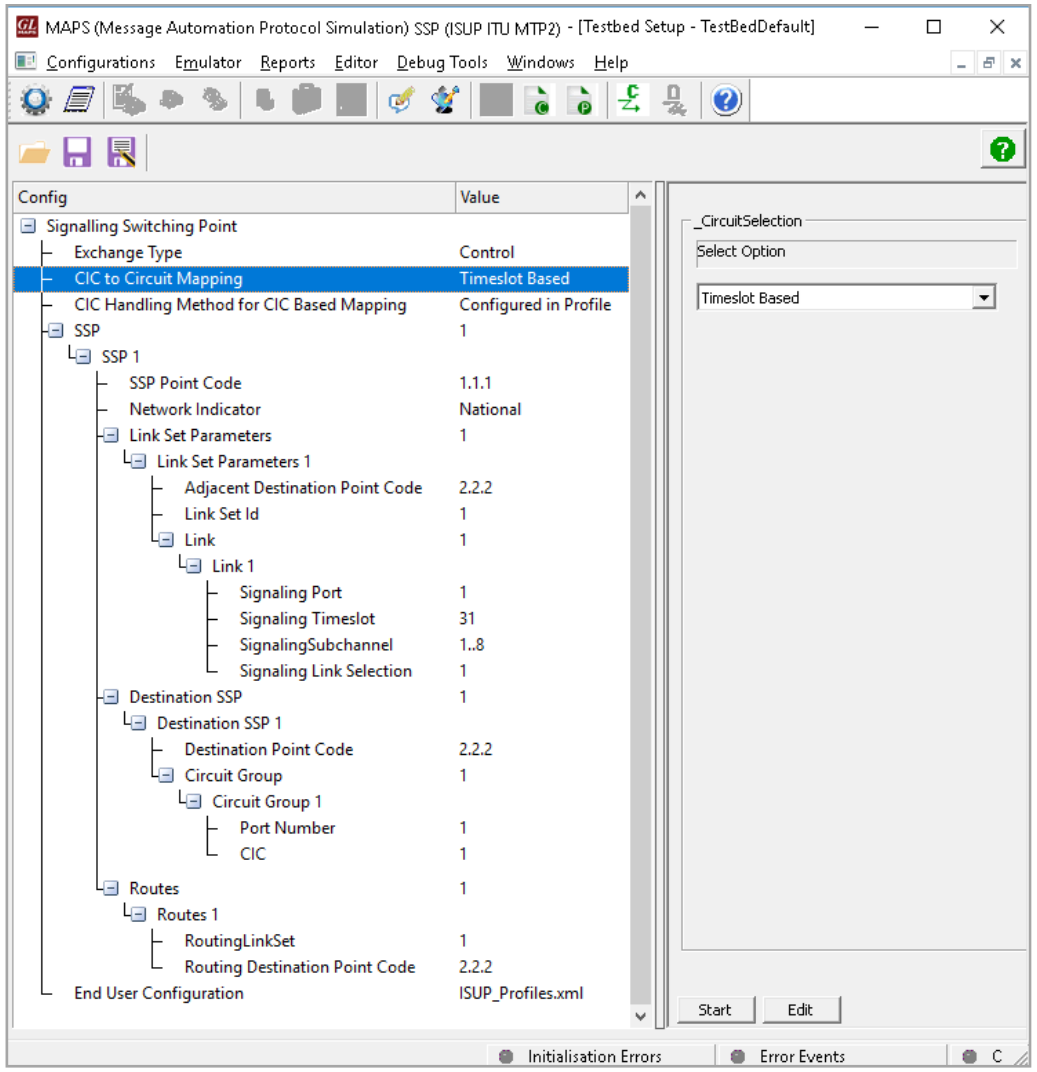
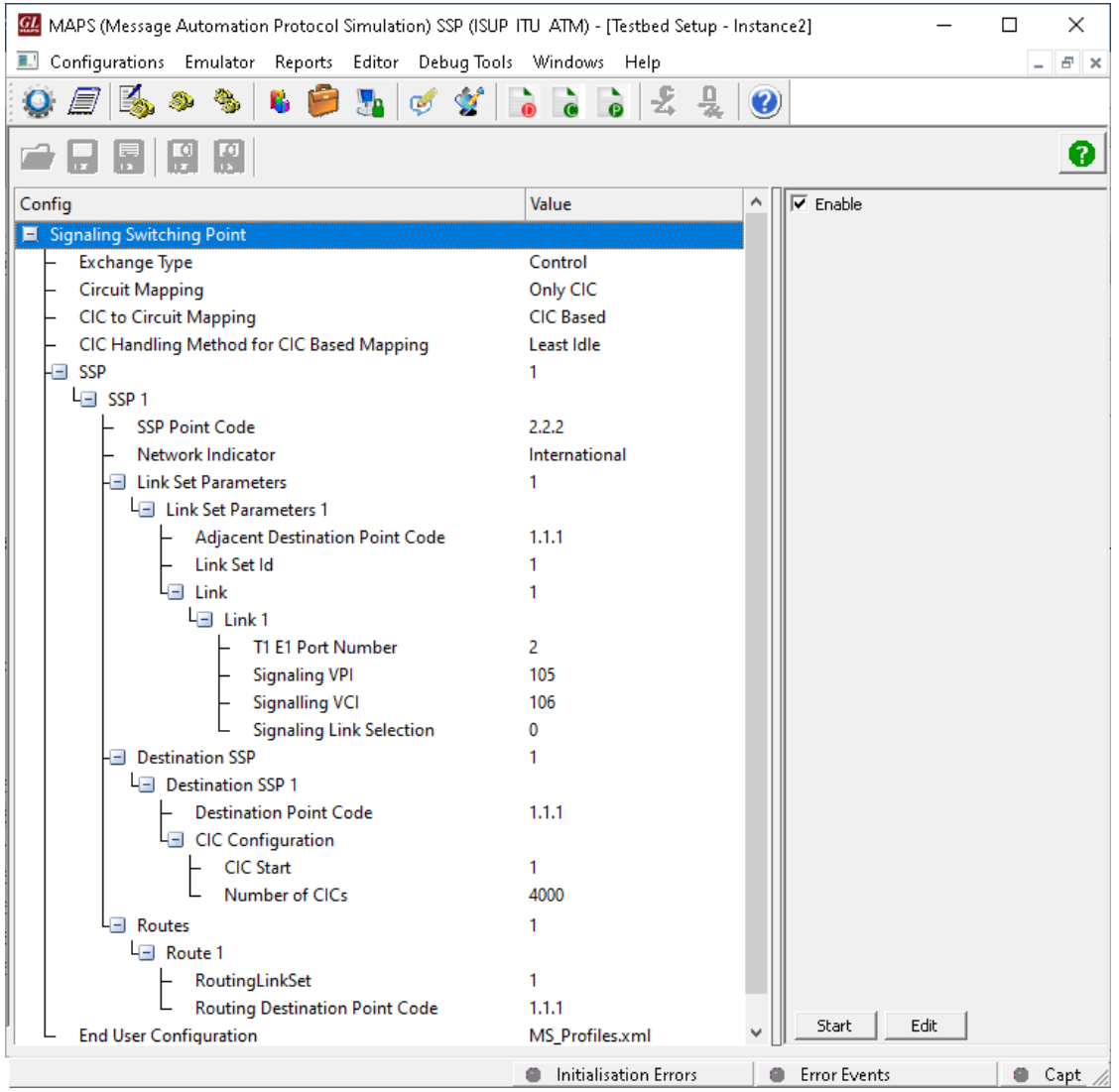
Testbed Setup Configuration

MTP2 Testbed Setup



ATM Testbed Setup



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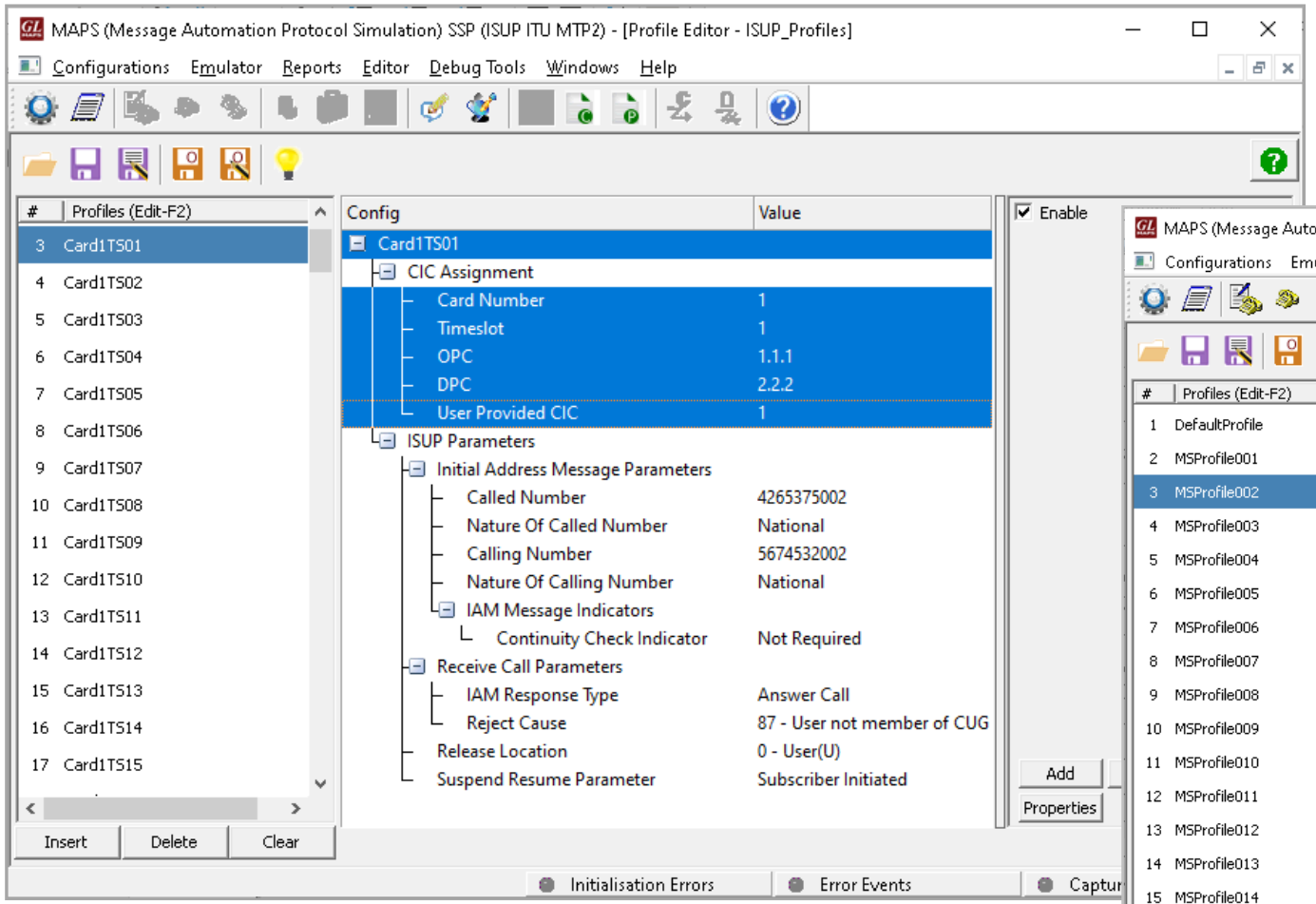
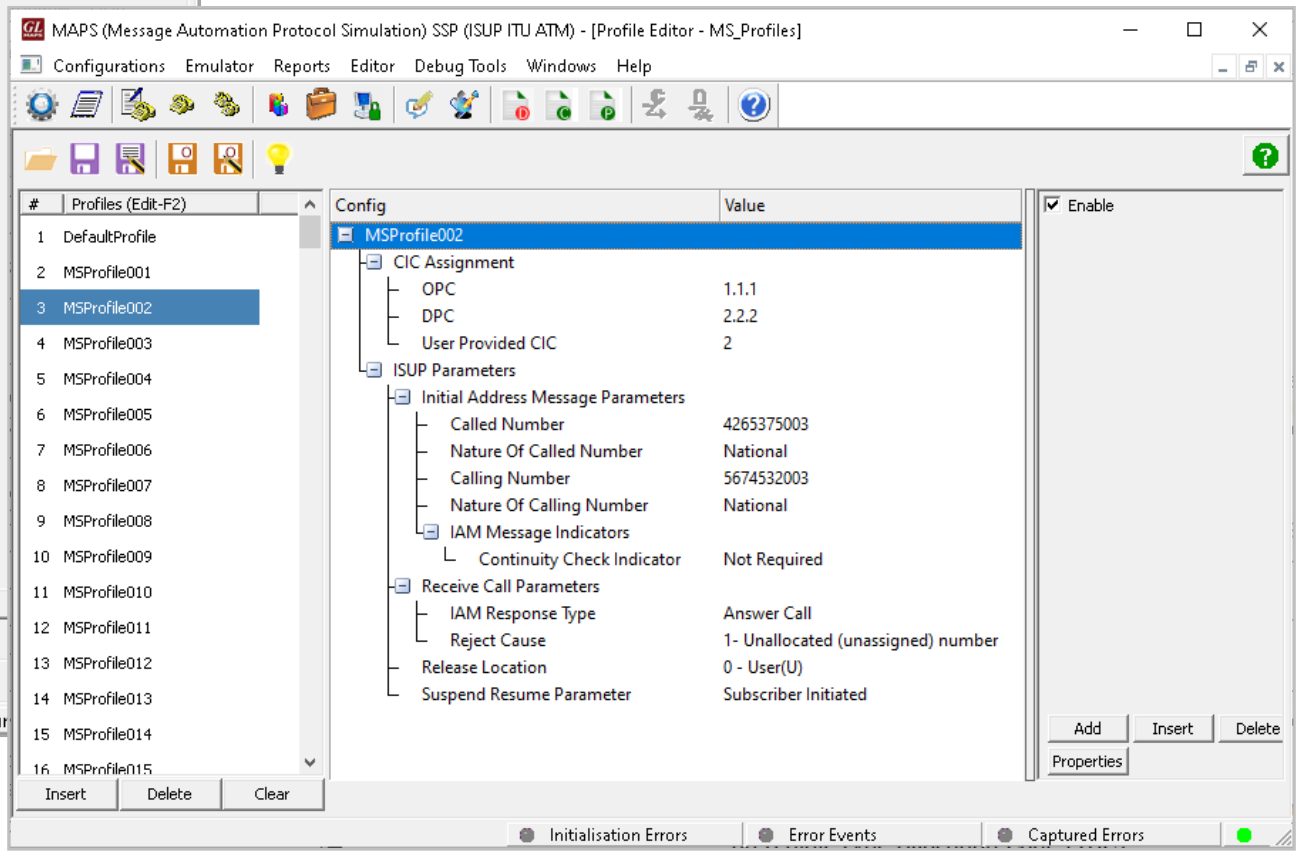
Profile Configuration

ISUP Profile



MS Profile



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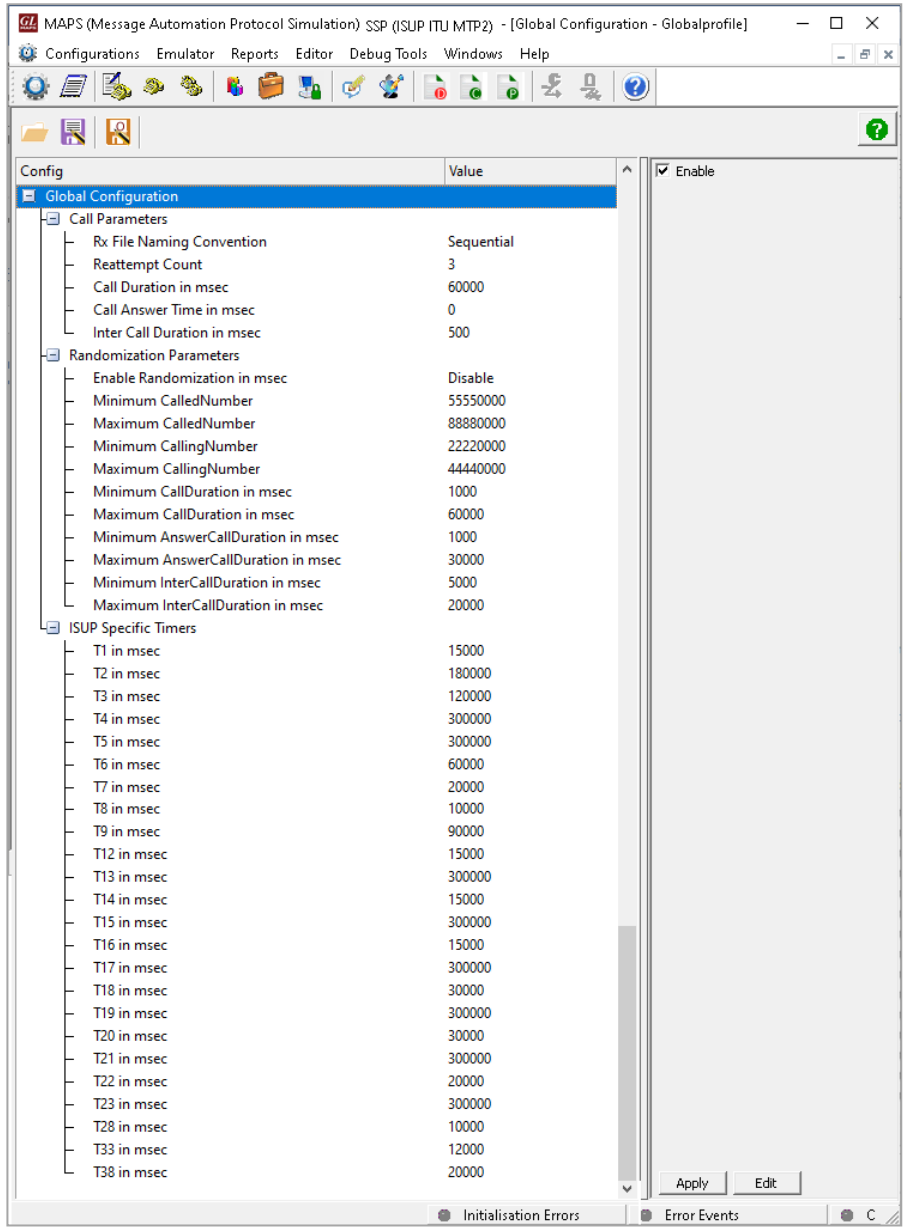
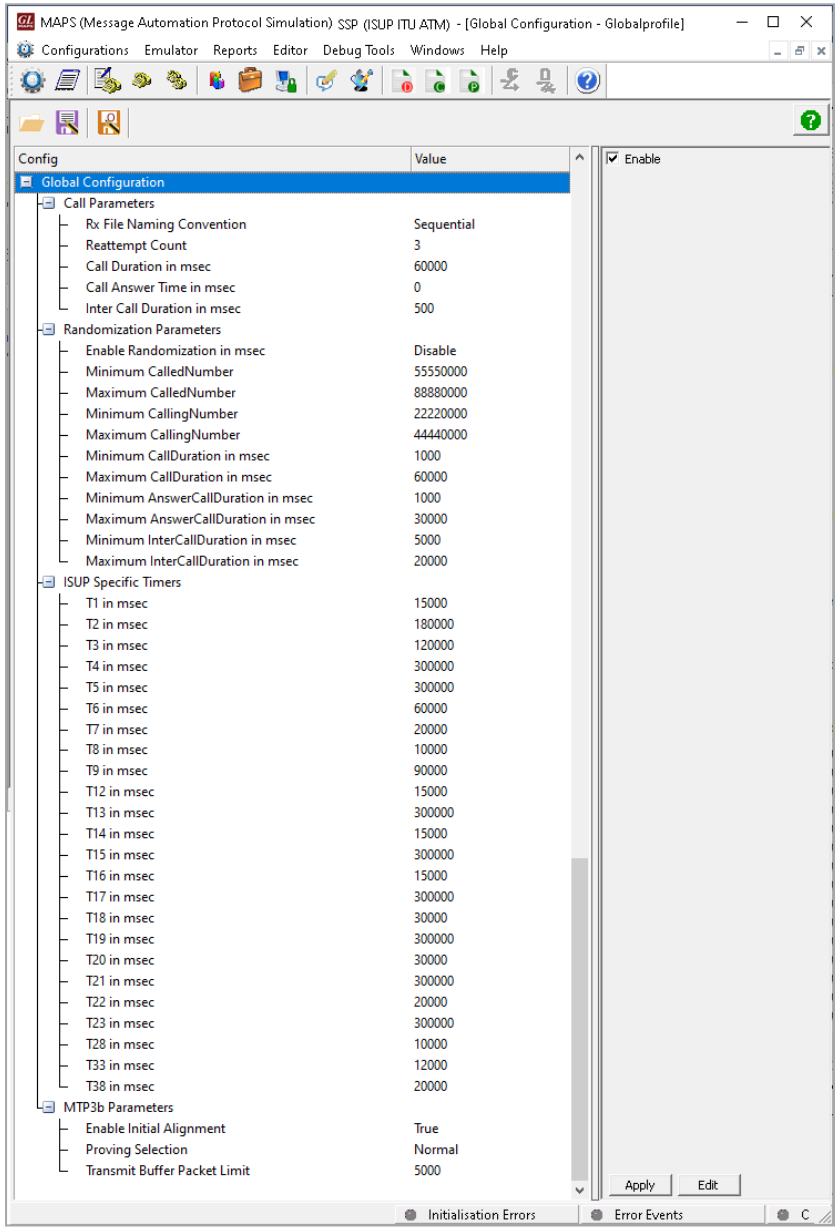
Global Configuration

MTP2 Global Profile



ATM Global Profile



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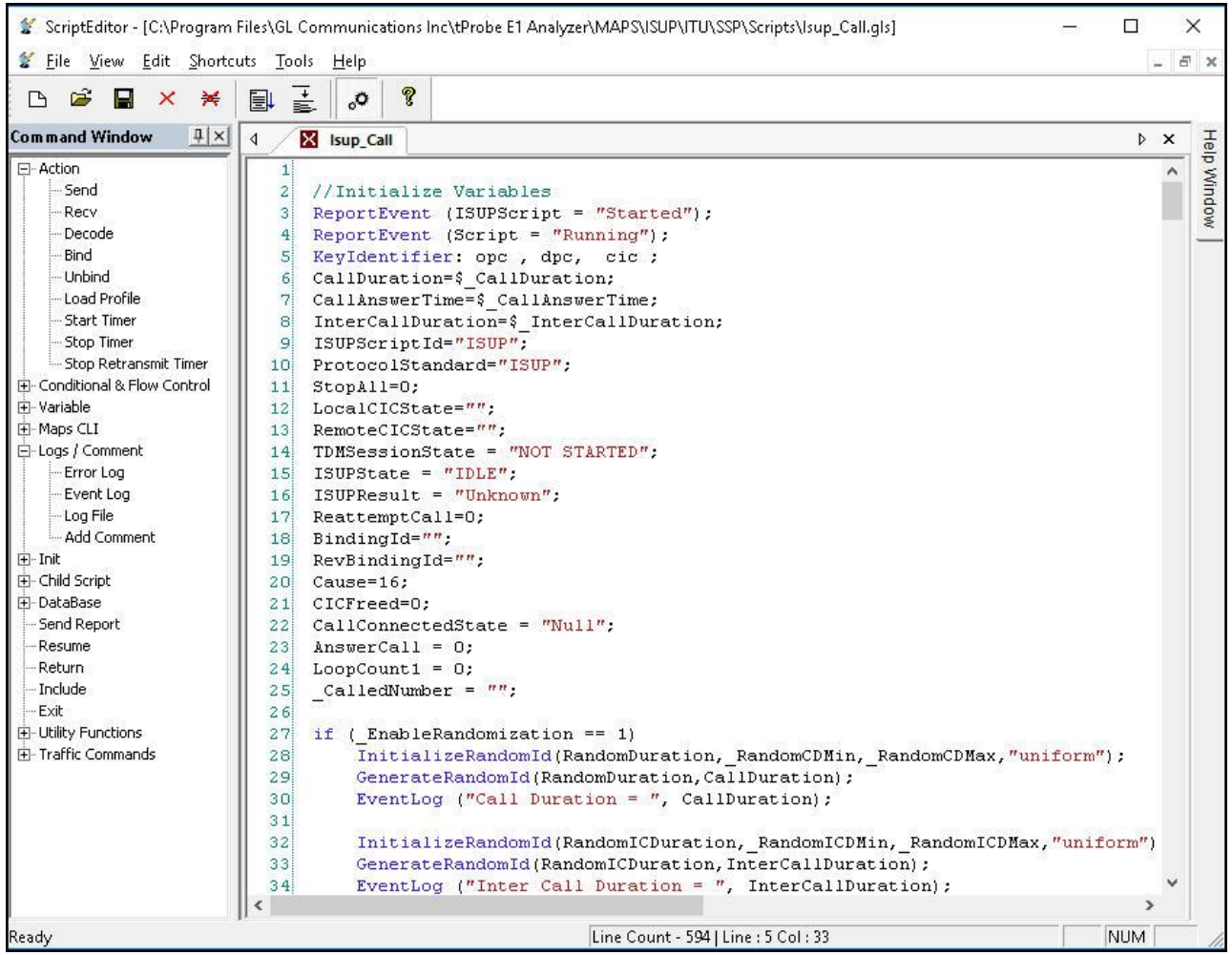
Script Editor

- 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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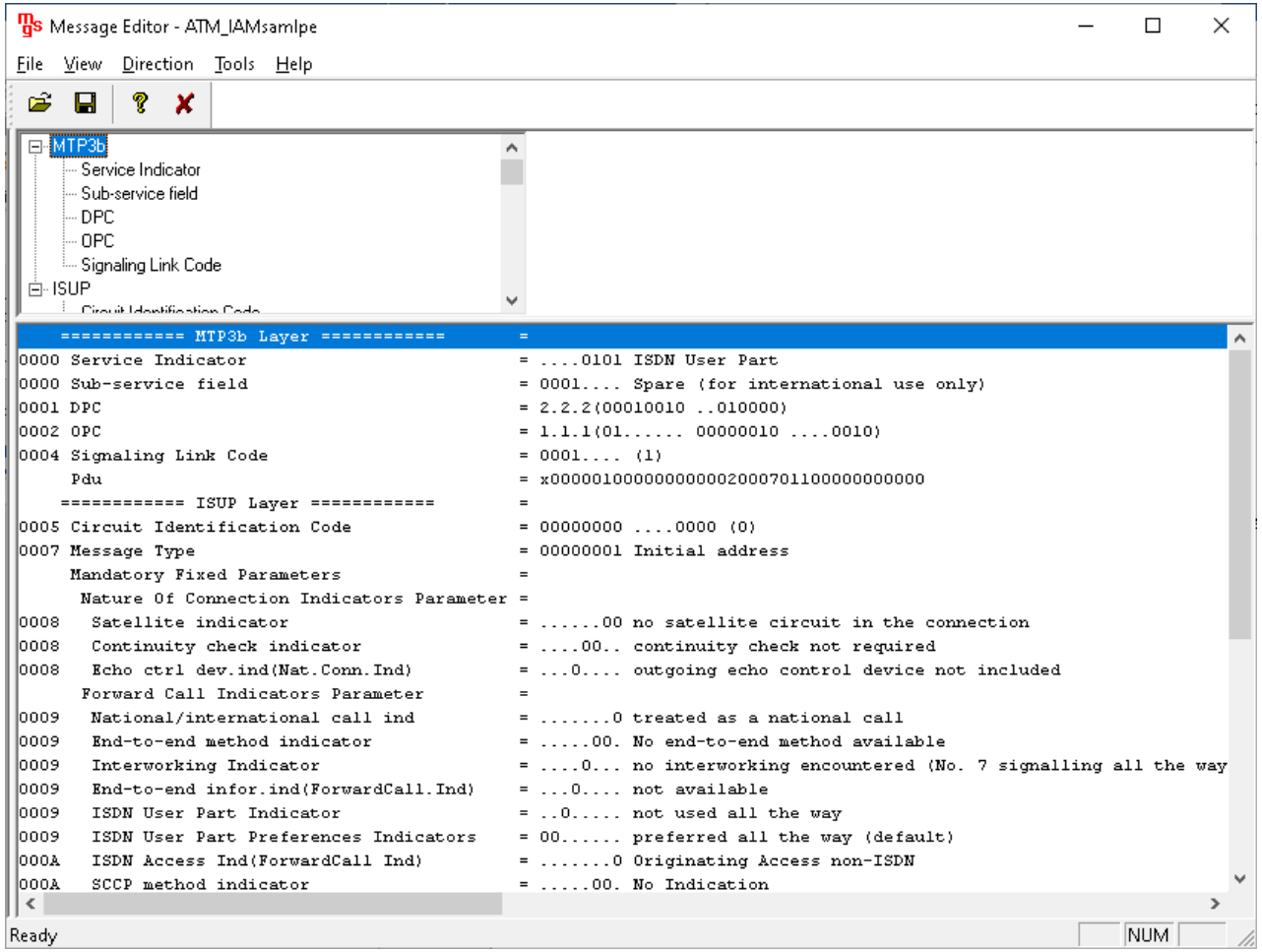
Message Editor

- When the script sends a message, it does so by loading a *.hdl file template from disk
- These message templates provide the actual structure of the message, the script simply populates it with values contained in its variables
- These messages are customizable by the user, header fields can be altered and removed. Binary-based messages are edited in our provided message editor



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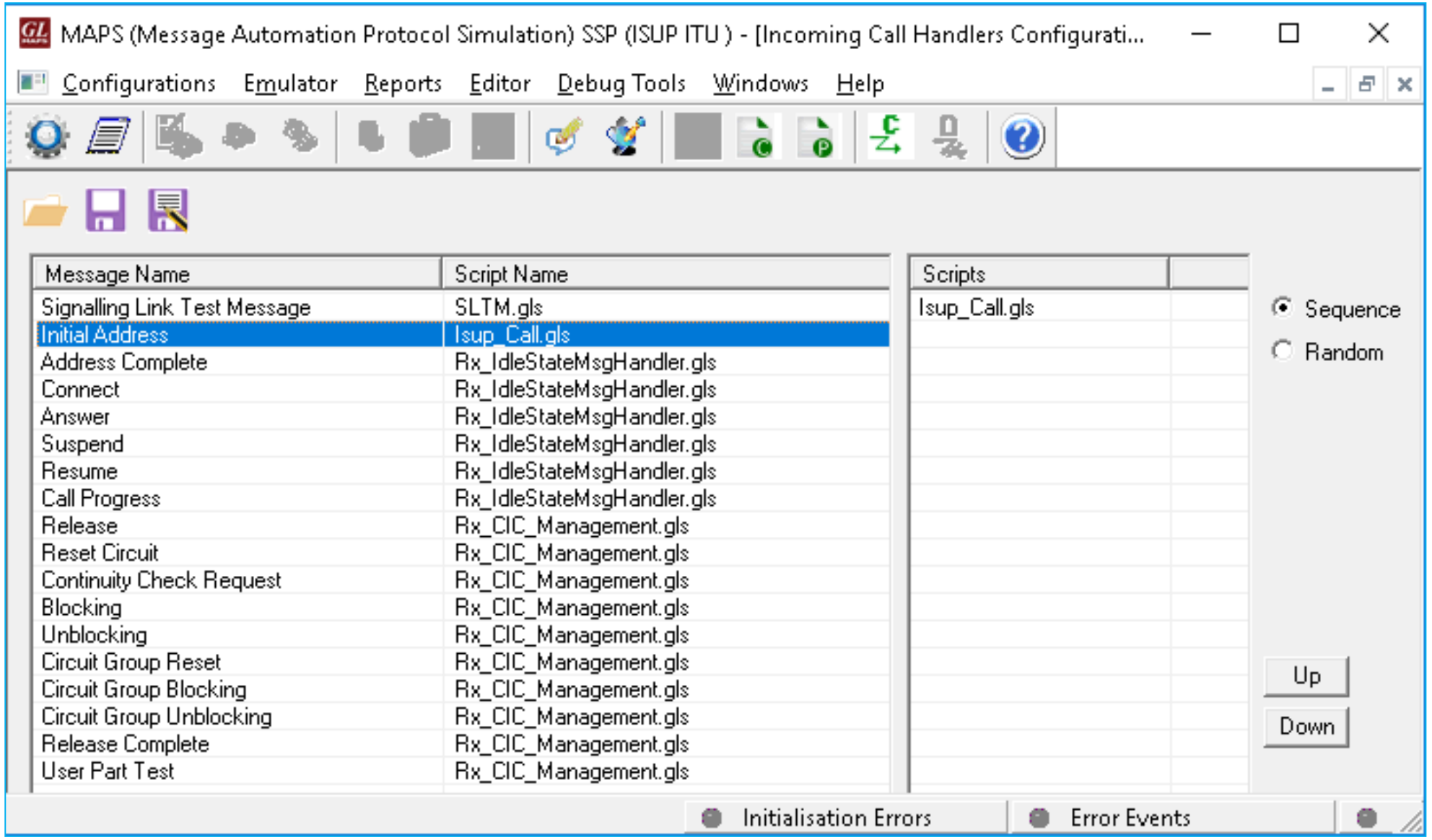
Incoming Call Handler Configuration



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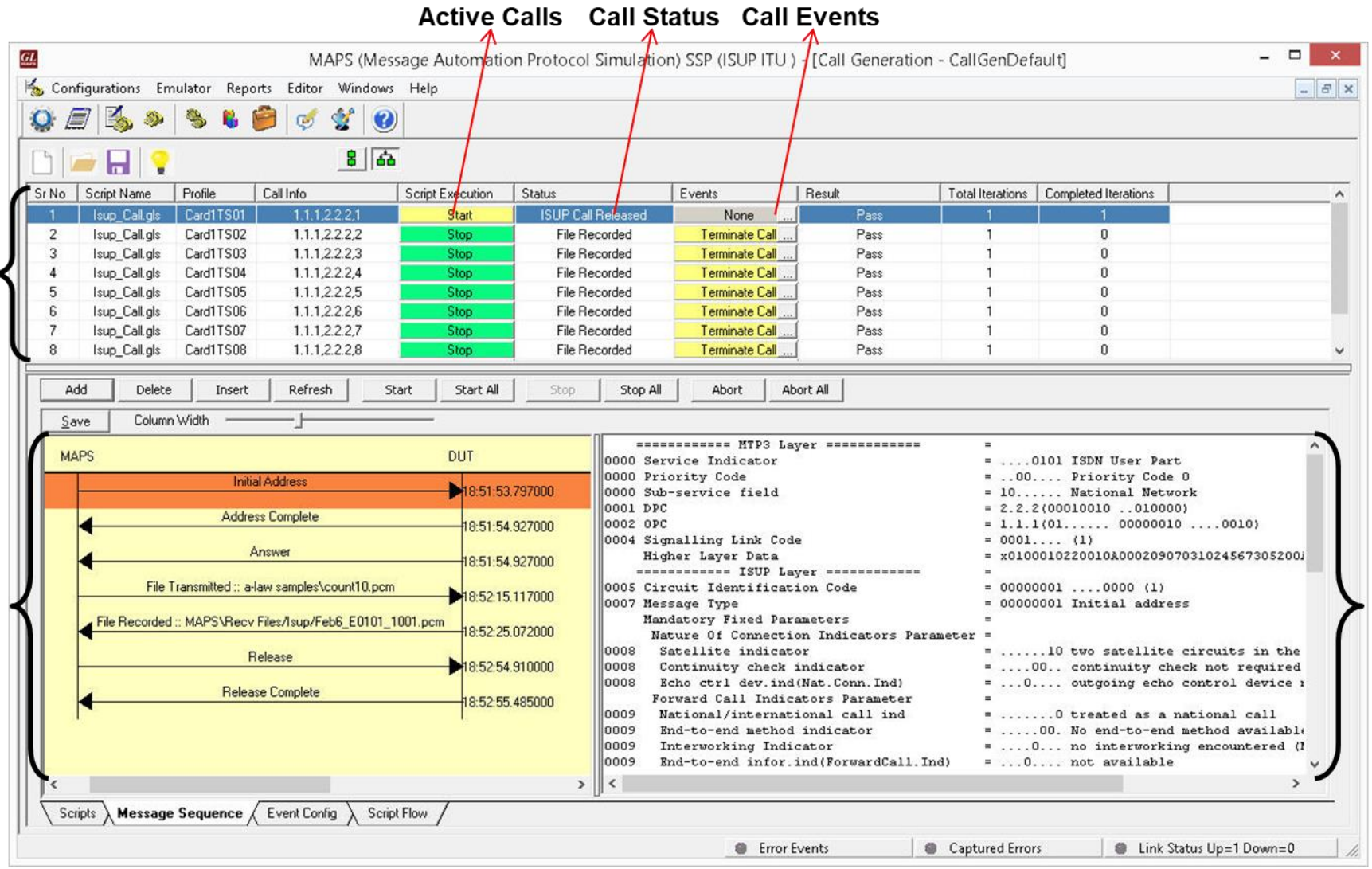
Call Generation



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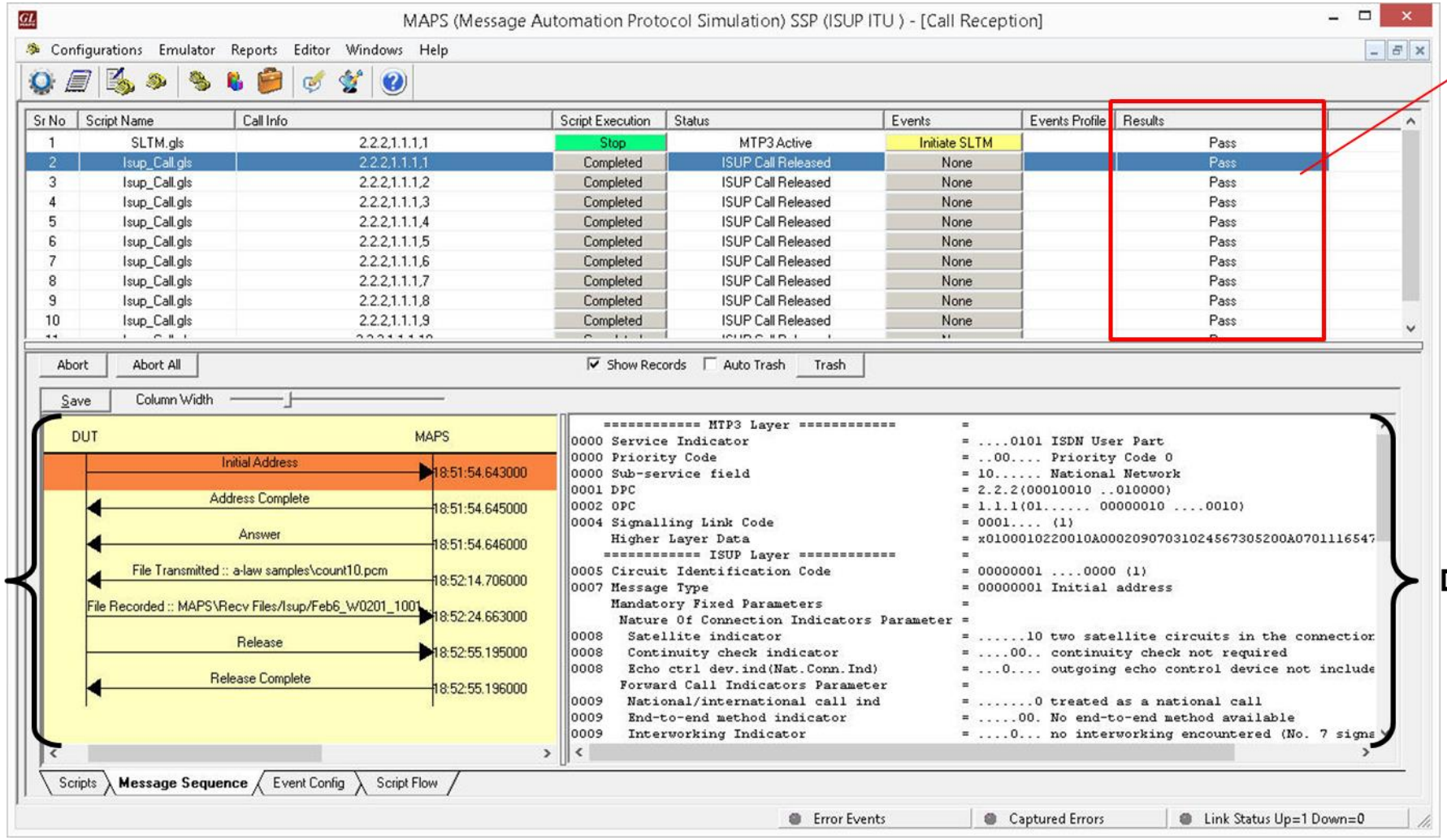
Call Reception



Call Results

Message Sequence

Decode Message

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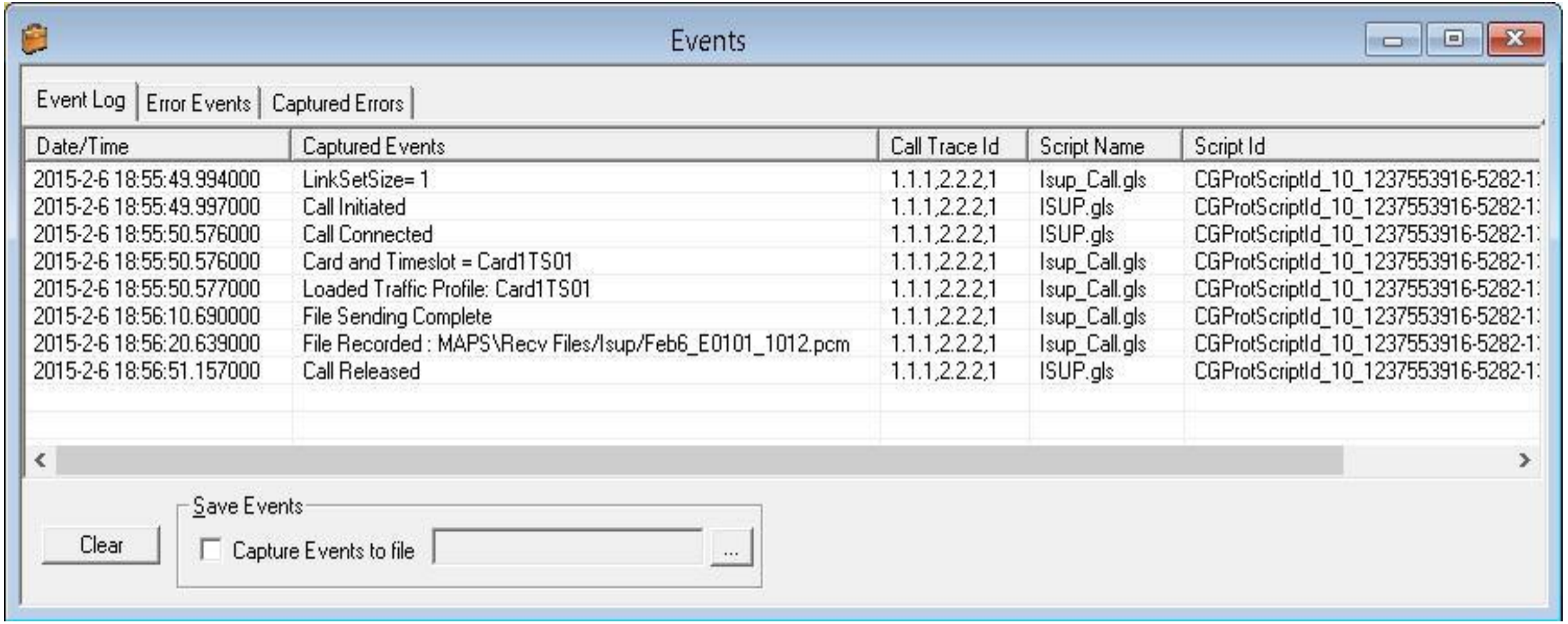
Events Log



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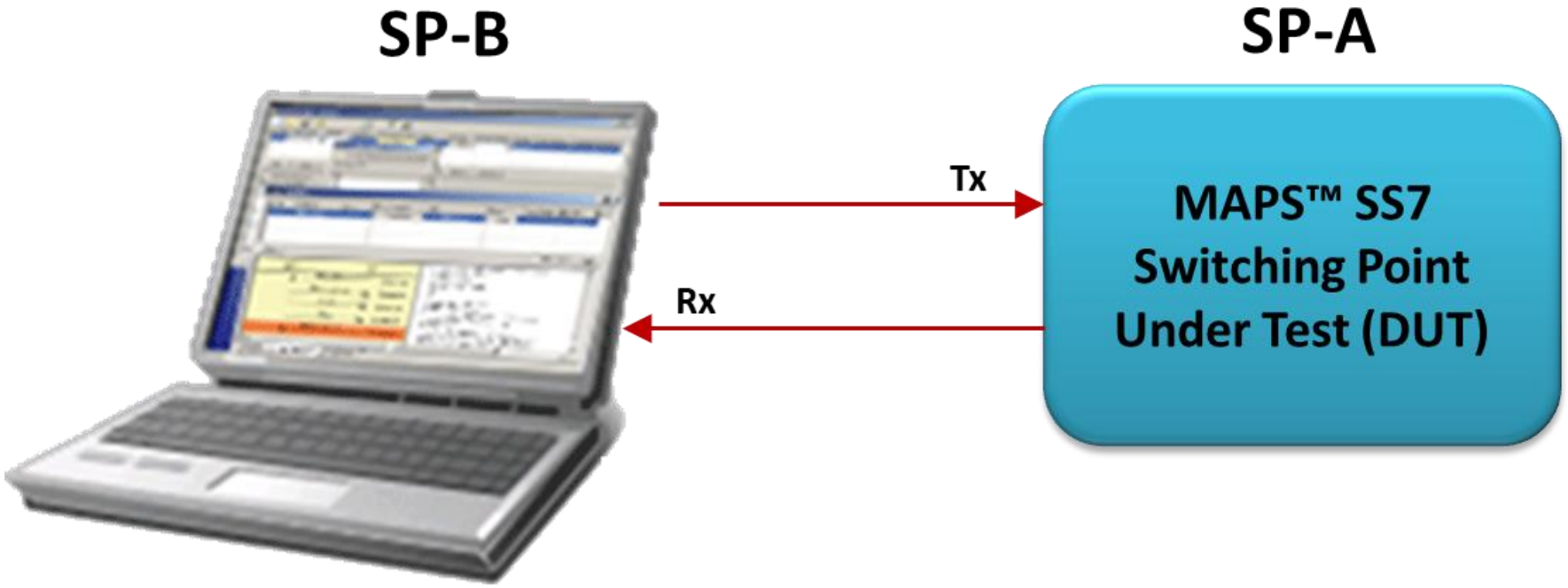
ISUP Conformance Testing (XX647)

ISUP Conformance Test Suite

- MAPS™ ISUP Conformance is configured as SP-B to send message using SPB-1.2.1.gls script; in the second scenario, MAPS™ ISUP Conformance is configured to receive message using SPB-4.1.gls script



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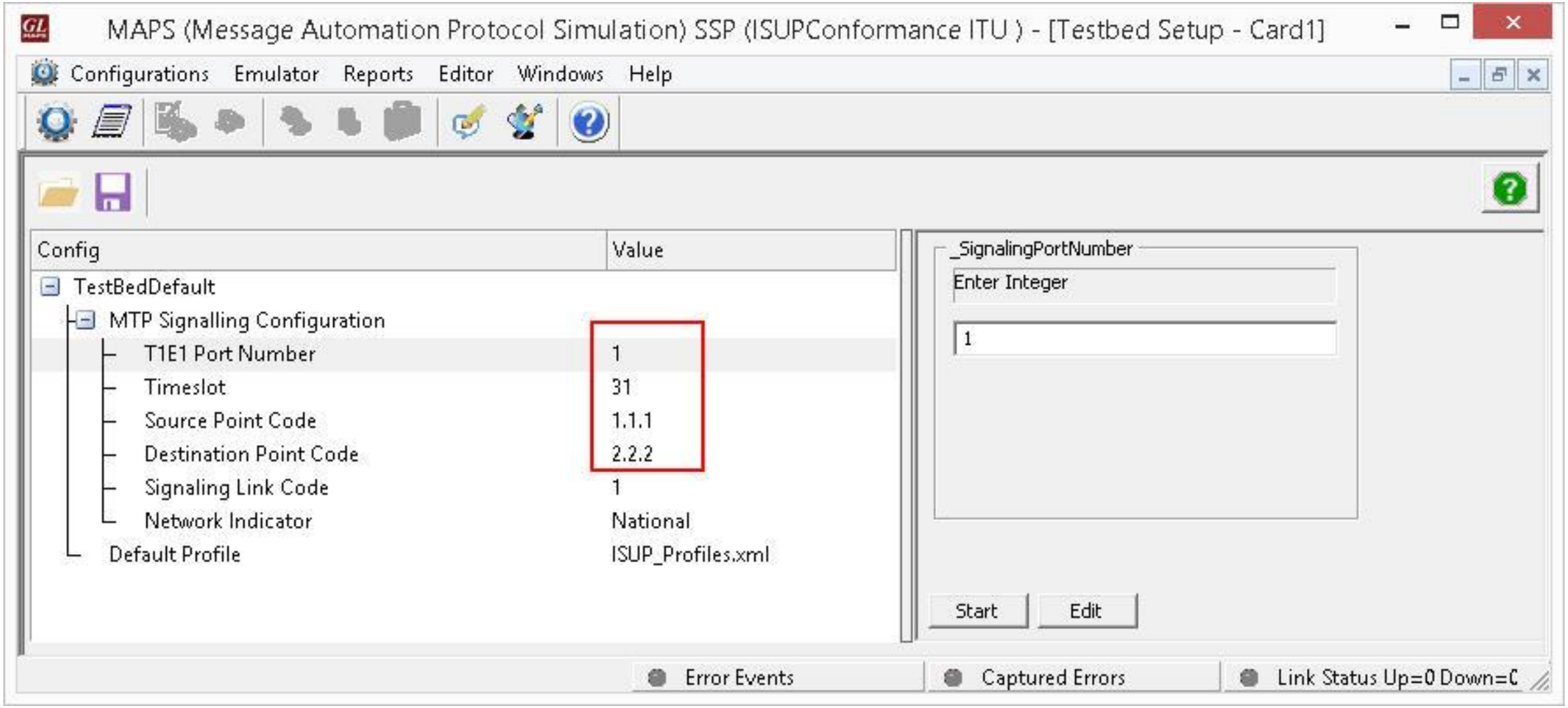
ISUP Conformance Testbed Configuration



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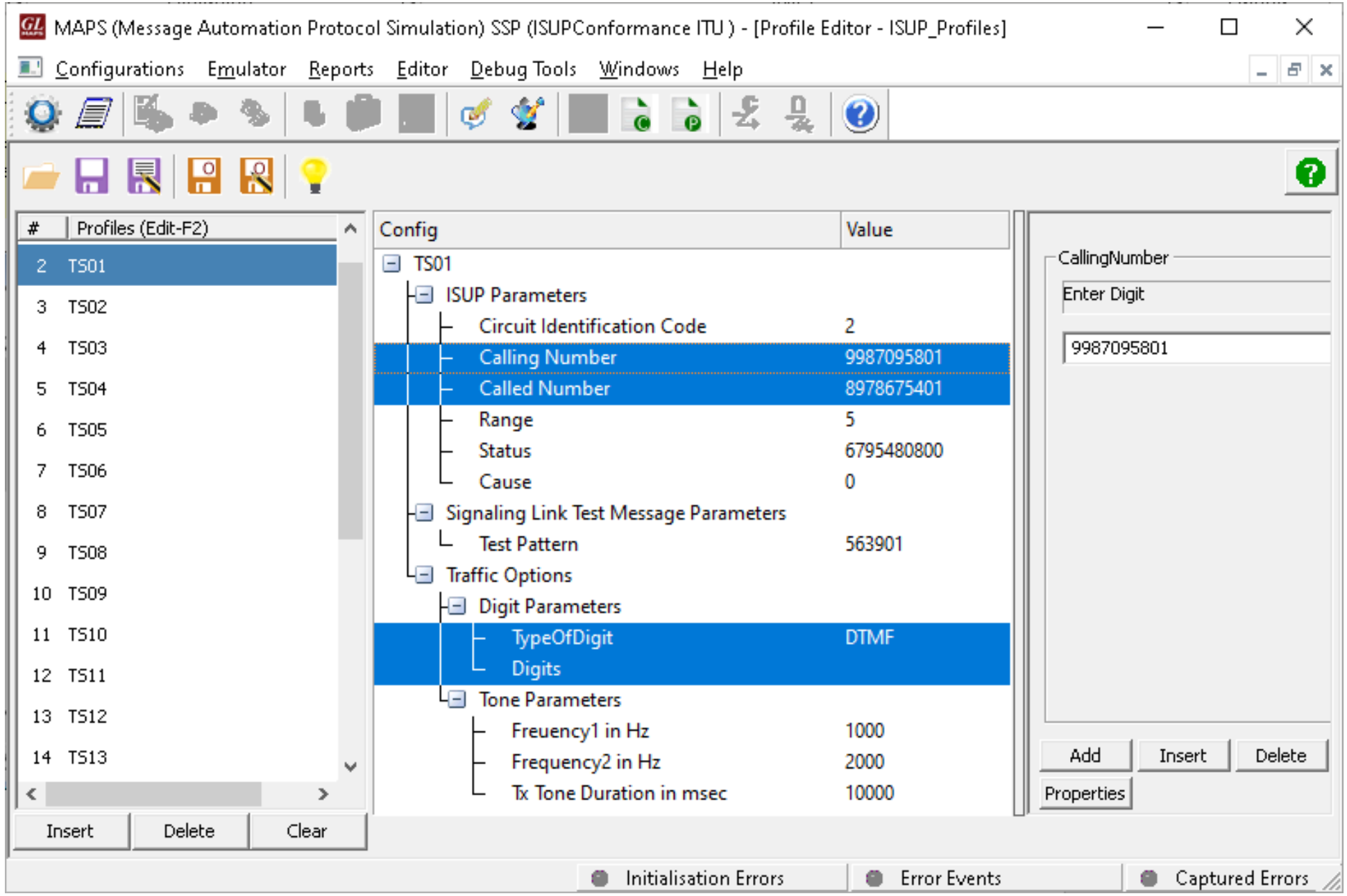
ISUP Conformance Profile Configuration



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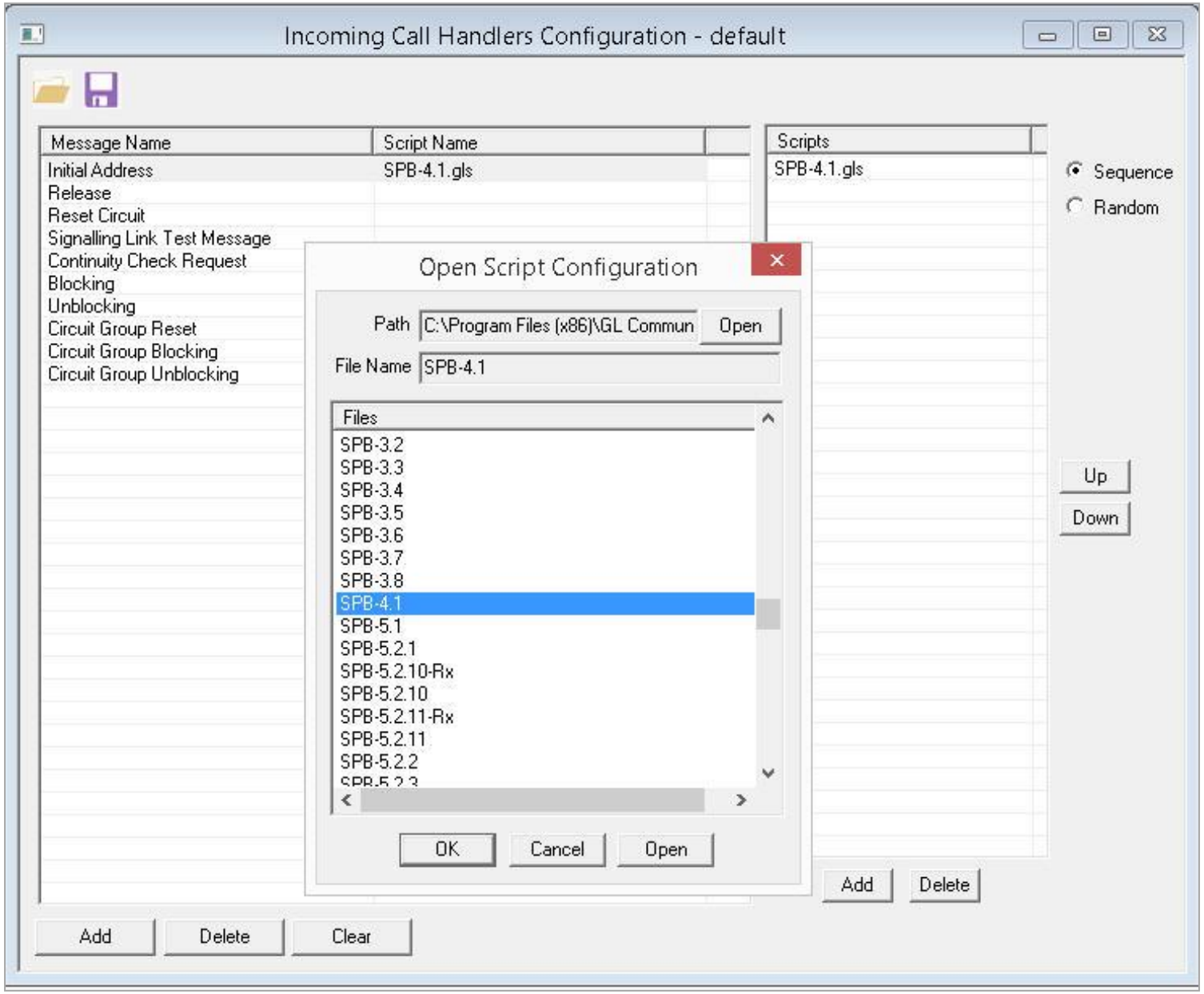
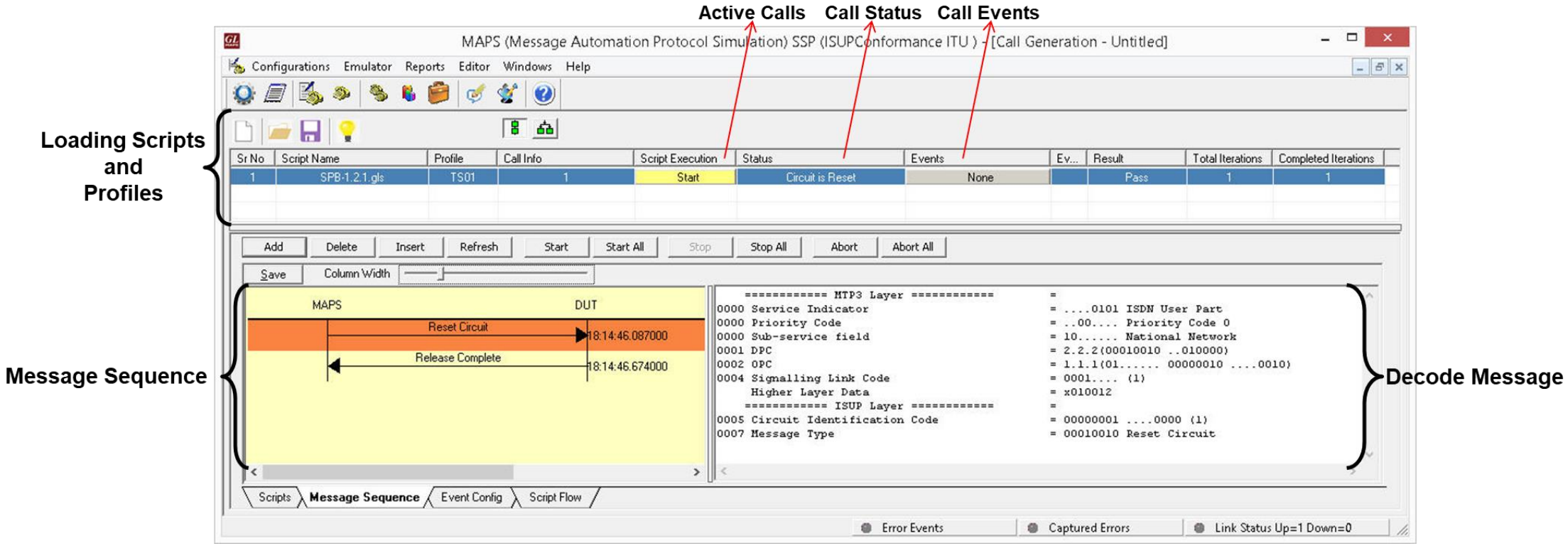
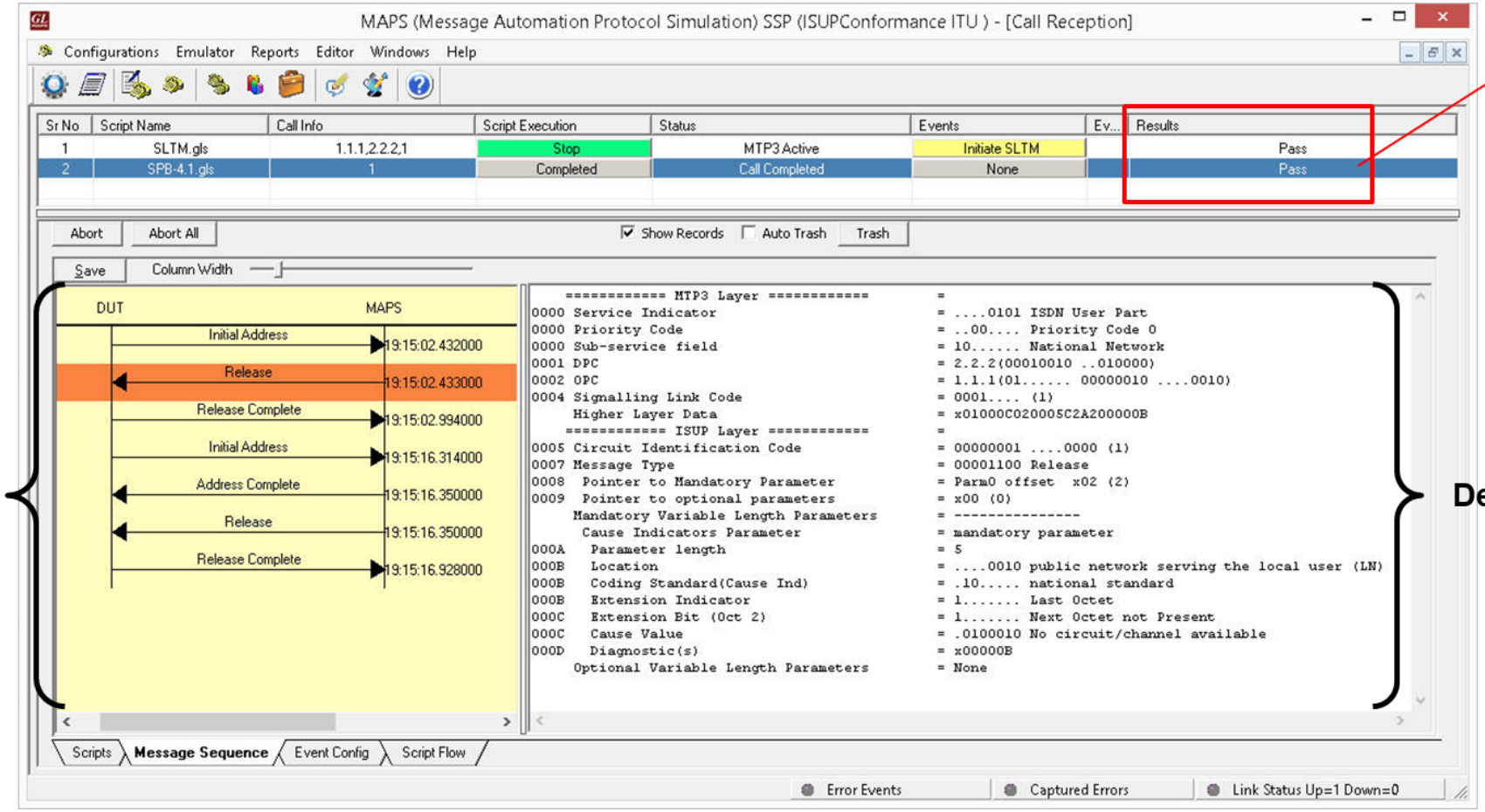
ISUP Conformance Incoming Call Handler Configuration



ISUP Conformance Call Generation



ISUP Conformance Call Reception



Call Results

Message Sequence

Decode Message

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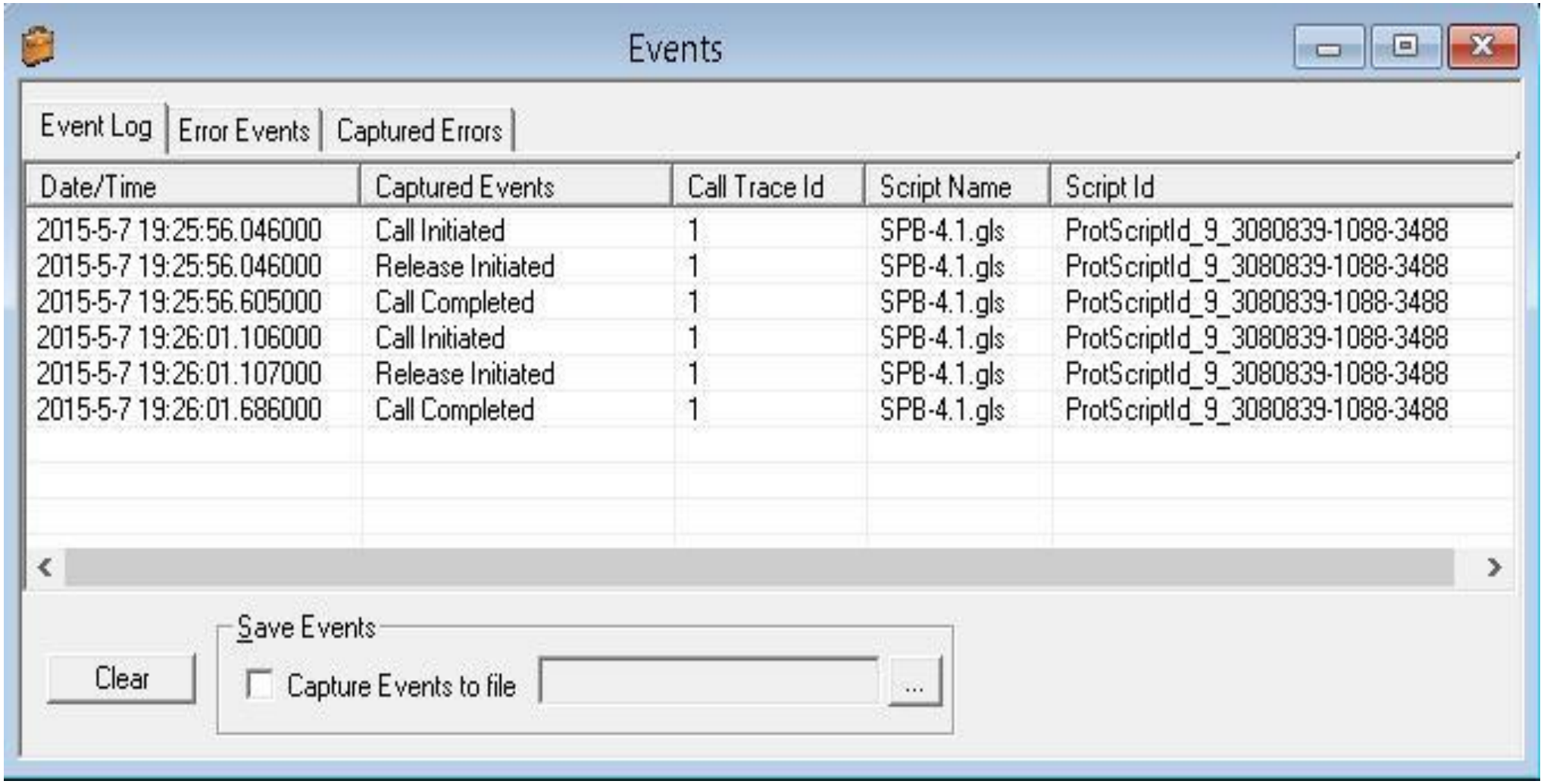
ISUP Conformance Events Log



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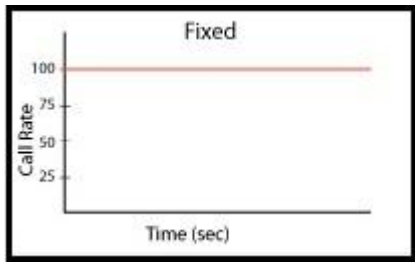
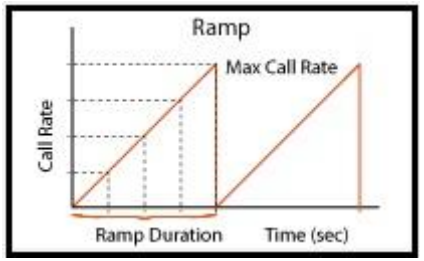
Load Generation

- 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.

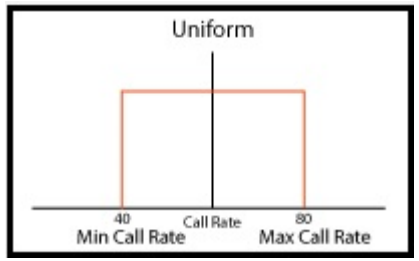
Fixed



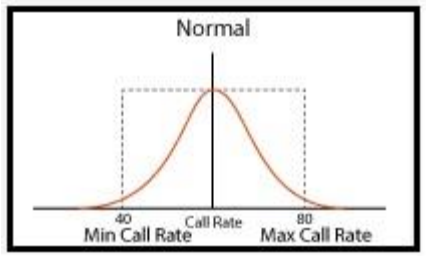
Ramp



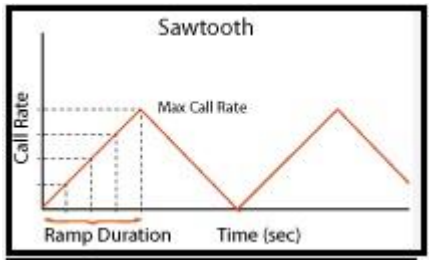
Uniform



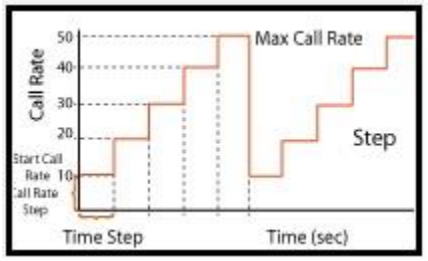
Normal

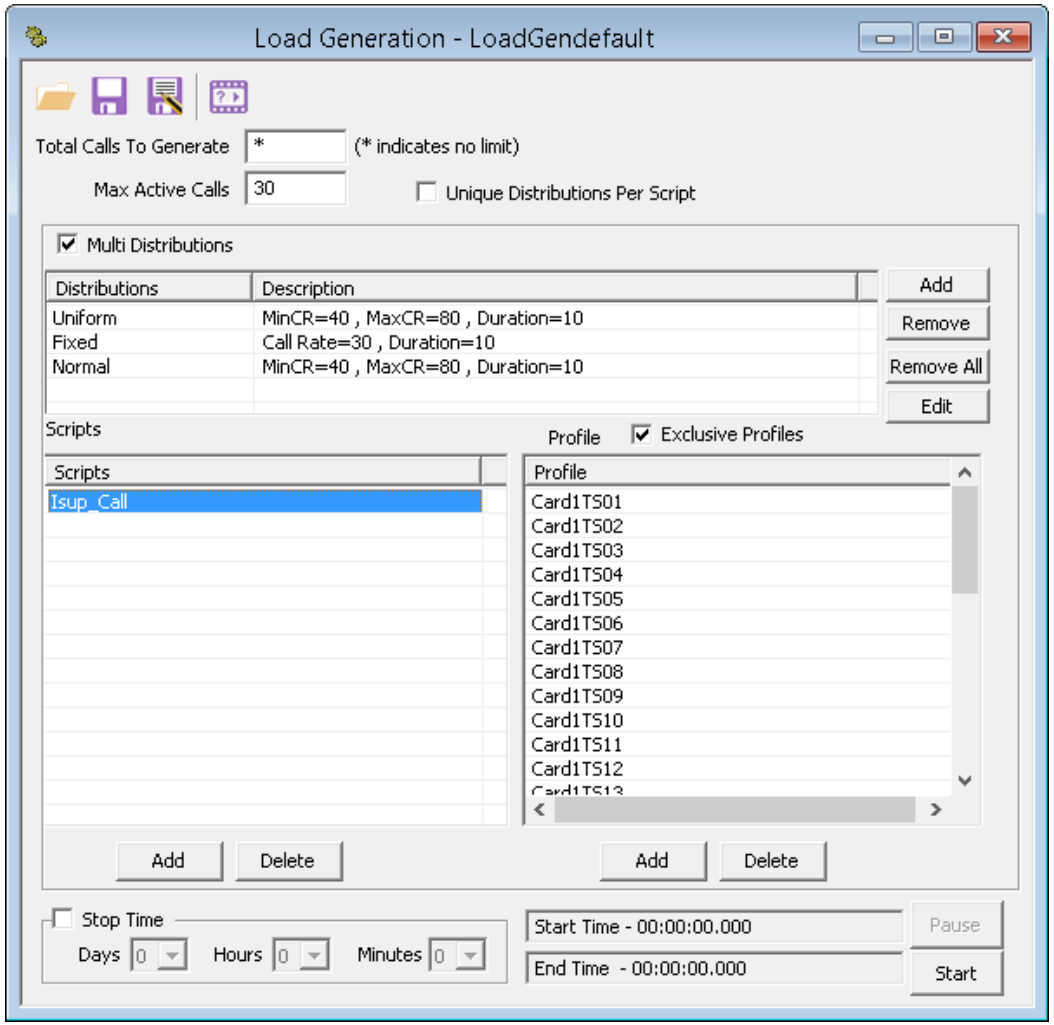


Saw-tooth



Step





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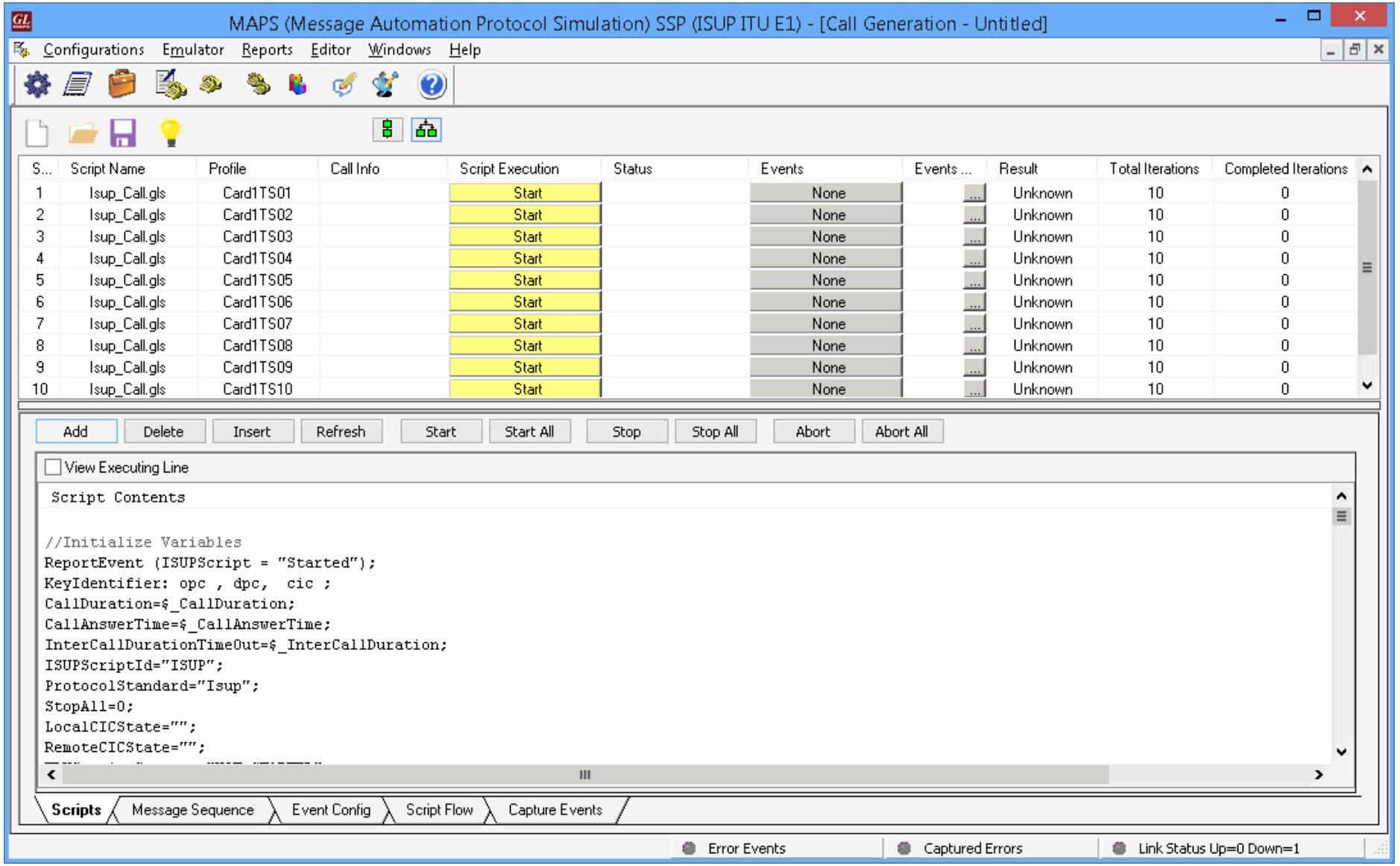
SS7 Bulk Call Generation



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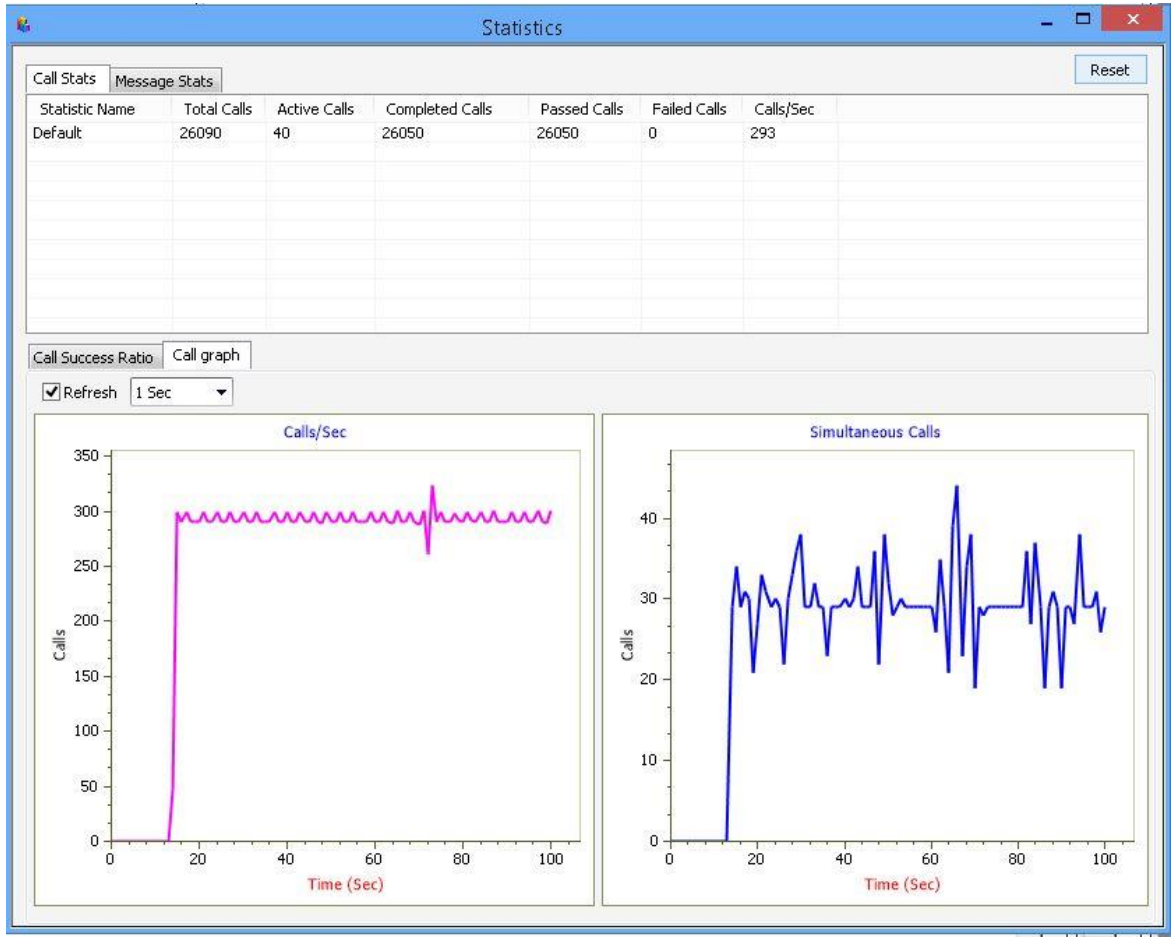
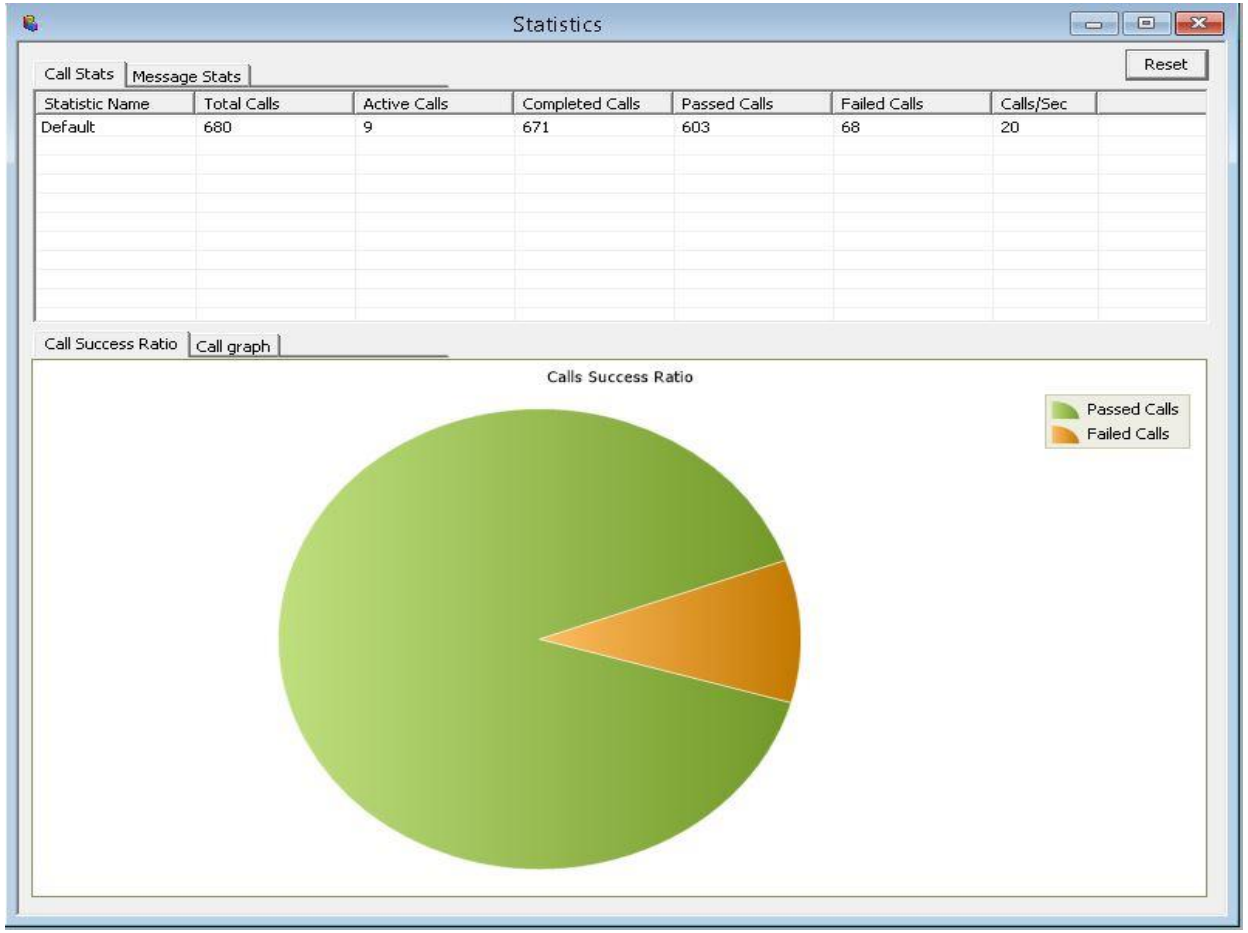
SS7 Call Ratio Statistics

Call Graph



Call Stats



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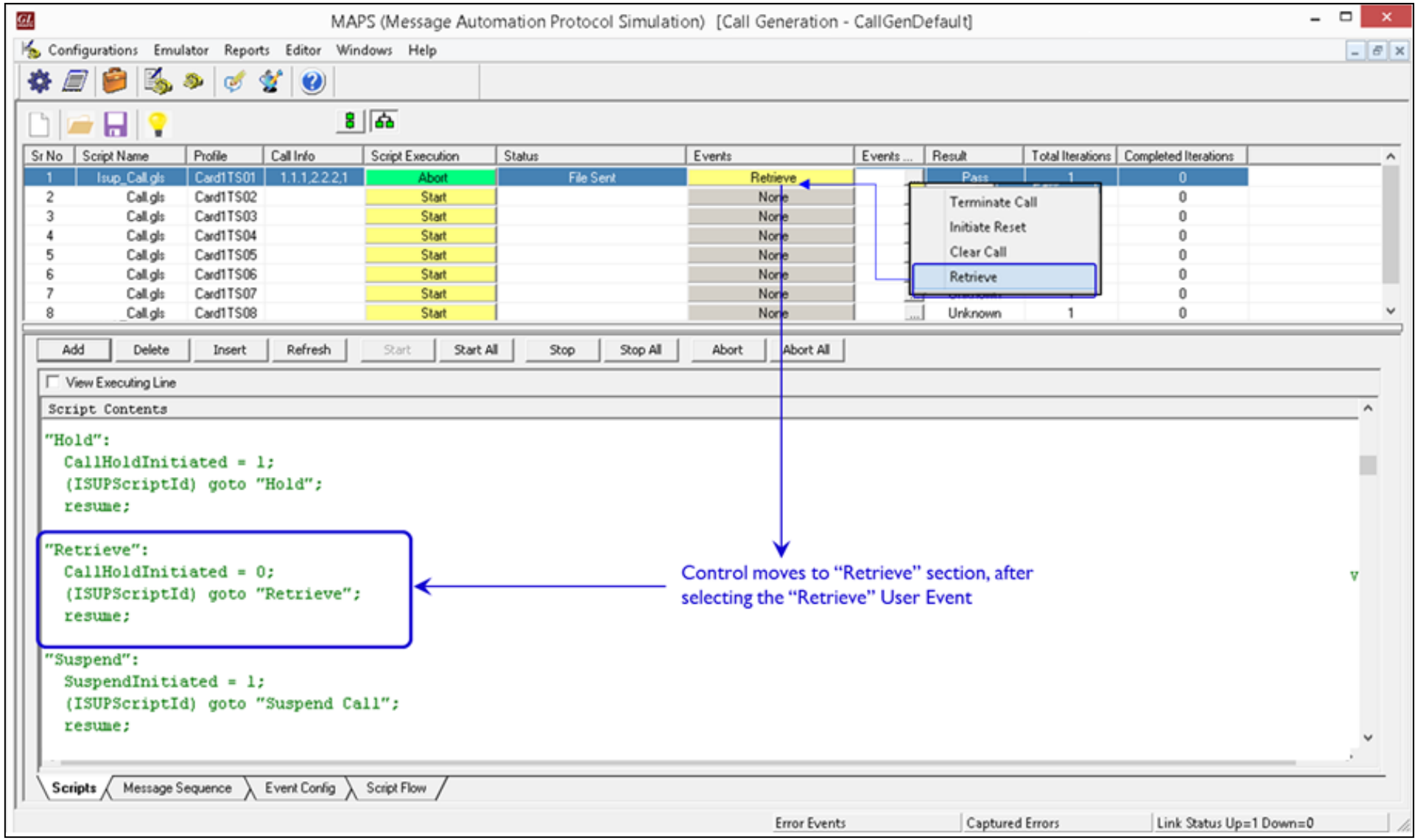
Customizations - User Events



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Customizations - Statistics and Reports

MOS, R-Factor

Packet Loss

Packets

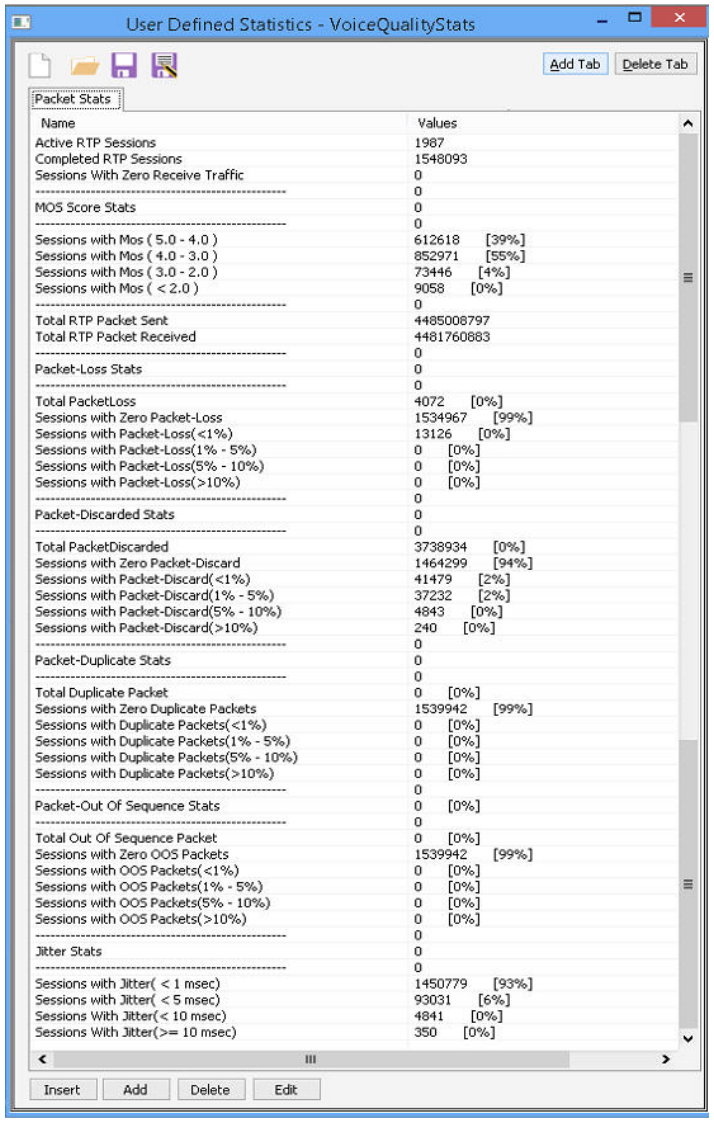
Discarded

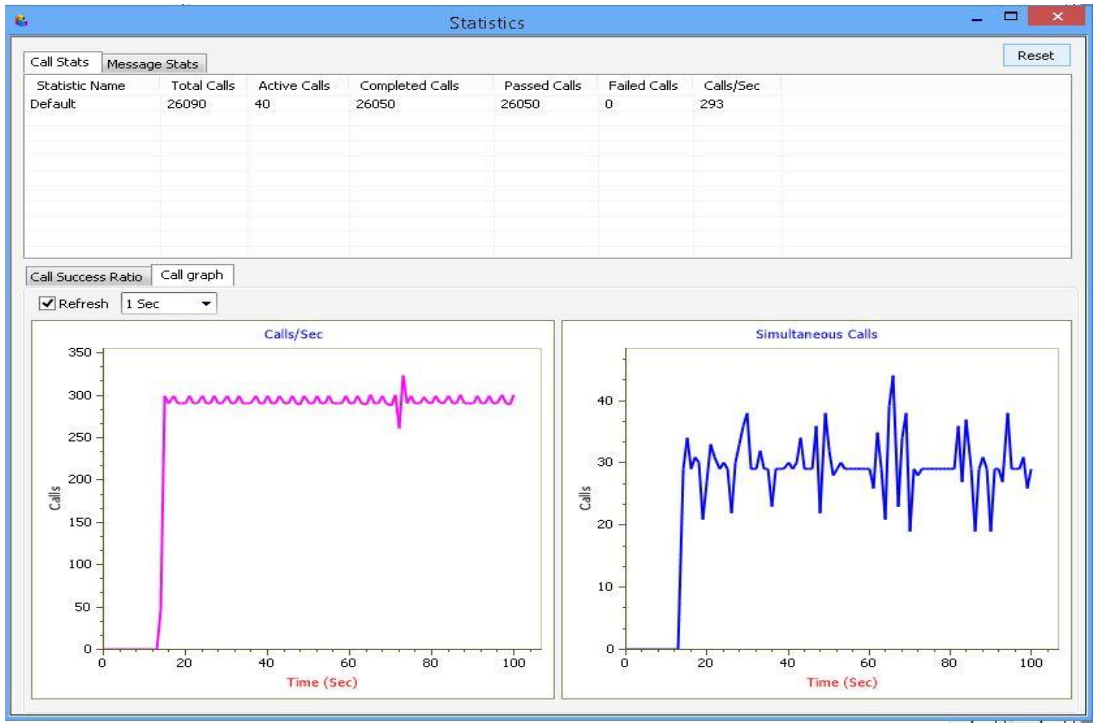
Duplicate Packets

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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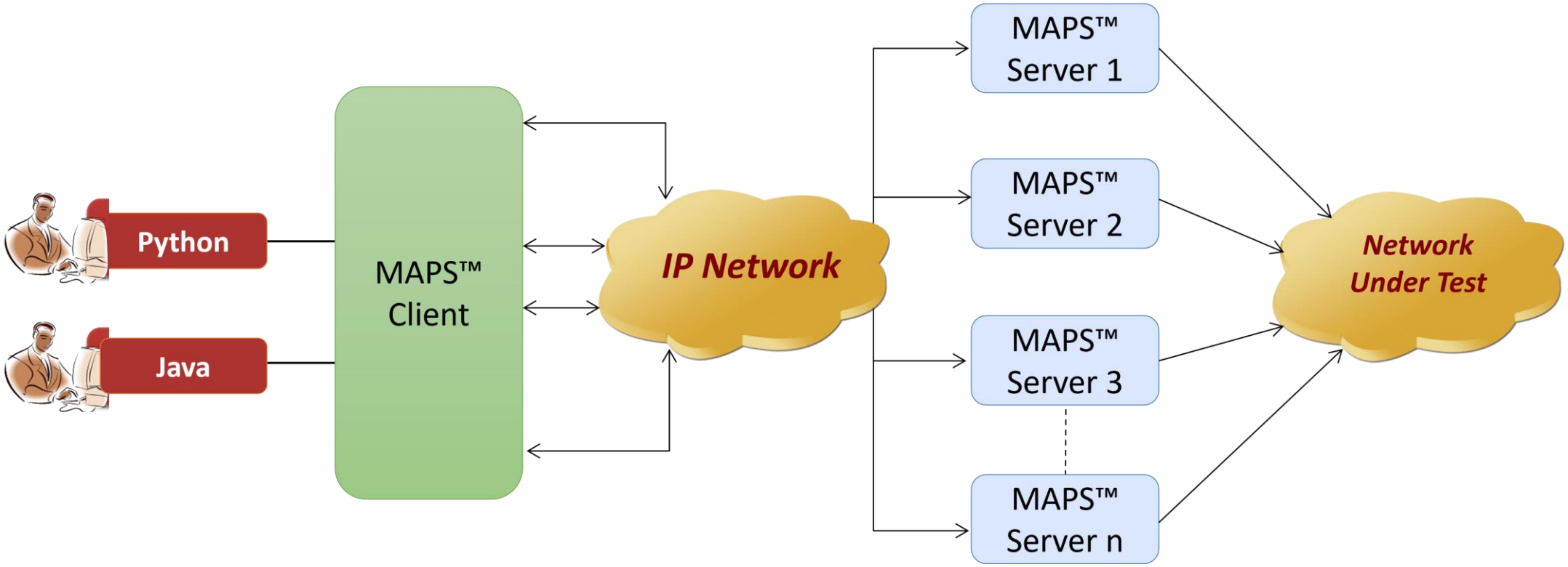
MAPS™ API Architecture

- 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



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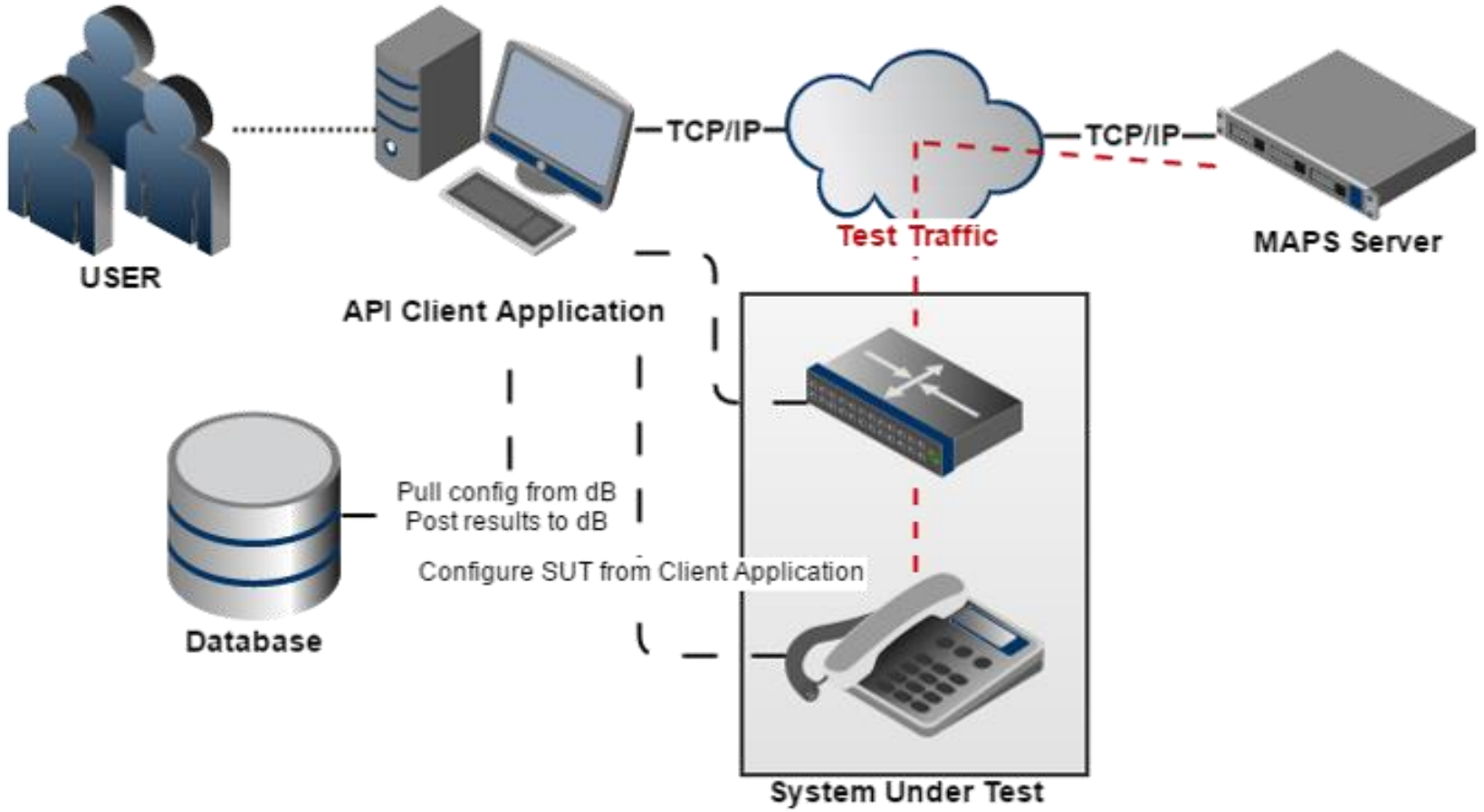
API Architecture

System Integration

- The same Client Application used to control MAPS™ can be, and very often is, used to control other elements of the System Under Test



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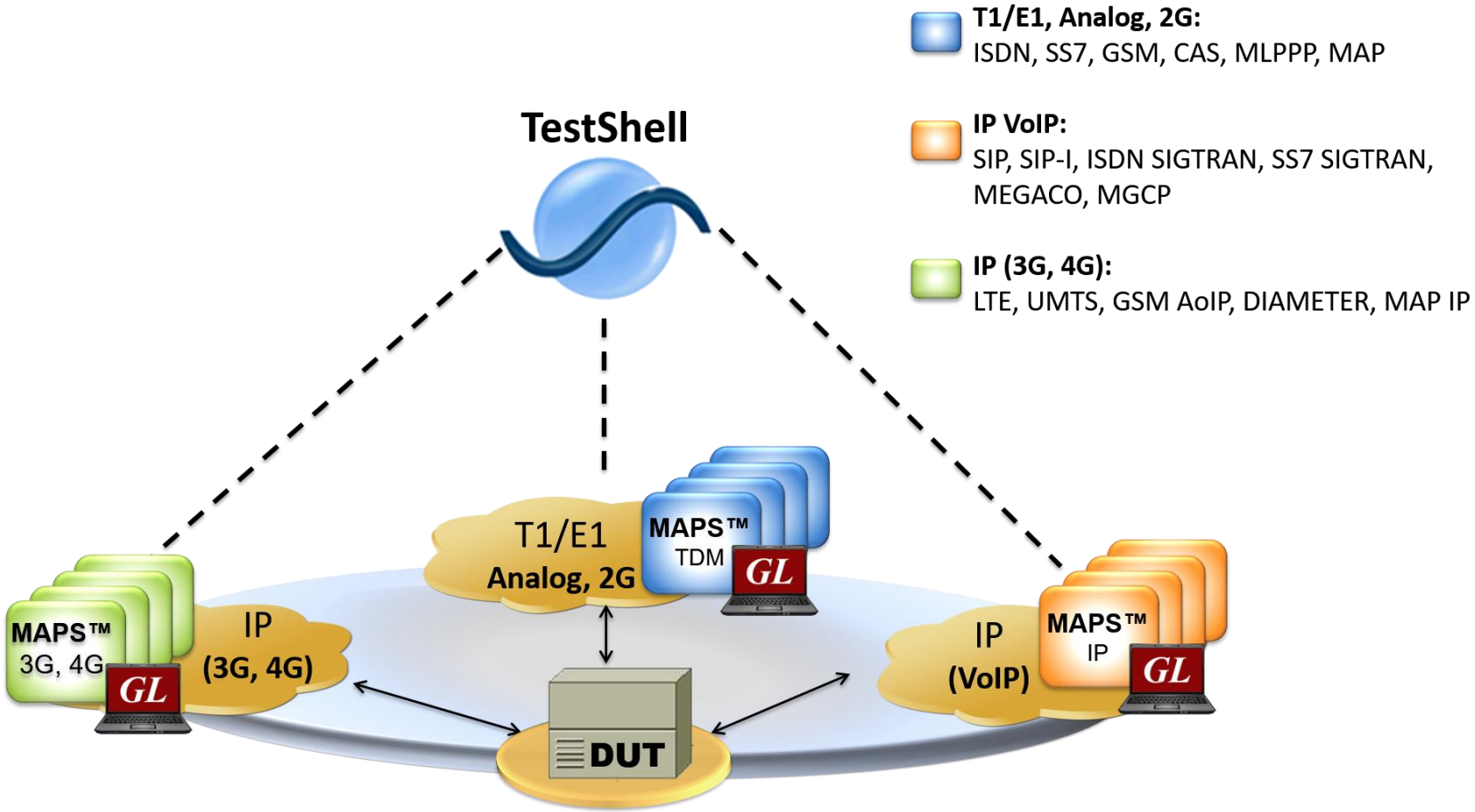
API Architecture

System Integration

- Client Application can be as simple as executing a script from an IDE or it can be integrated into a full-fledged automation test suite like QualiSystems TestShell or HP UFT



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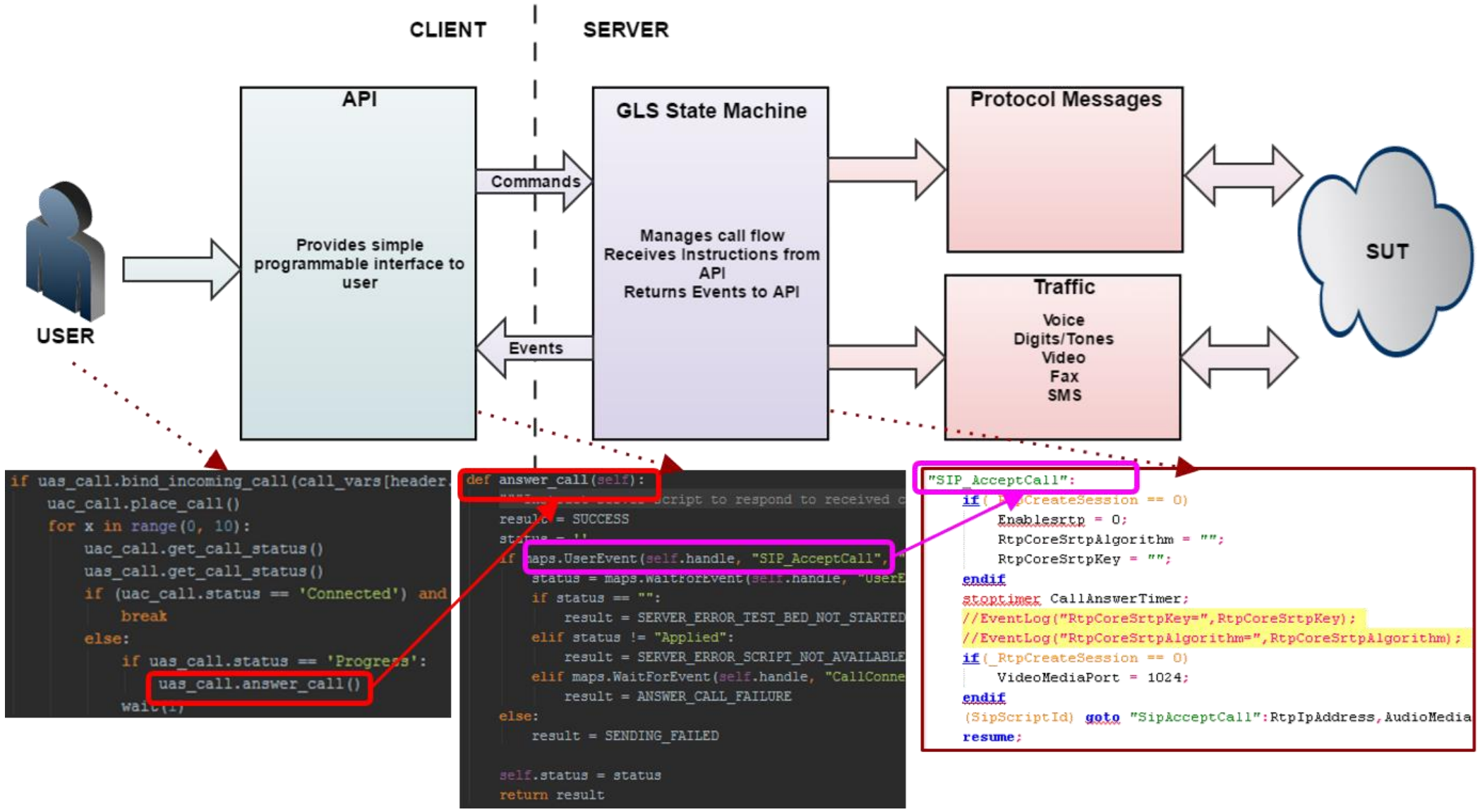
API Architecture



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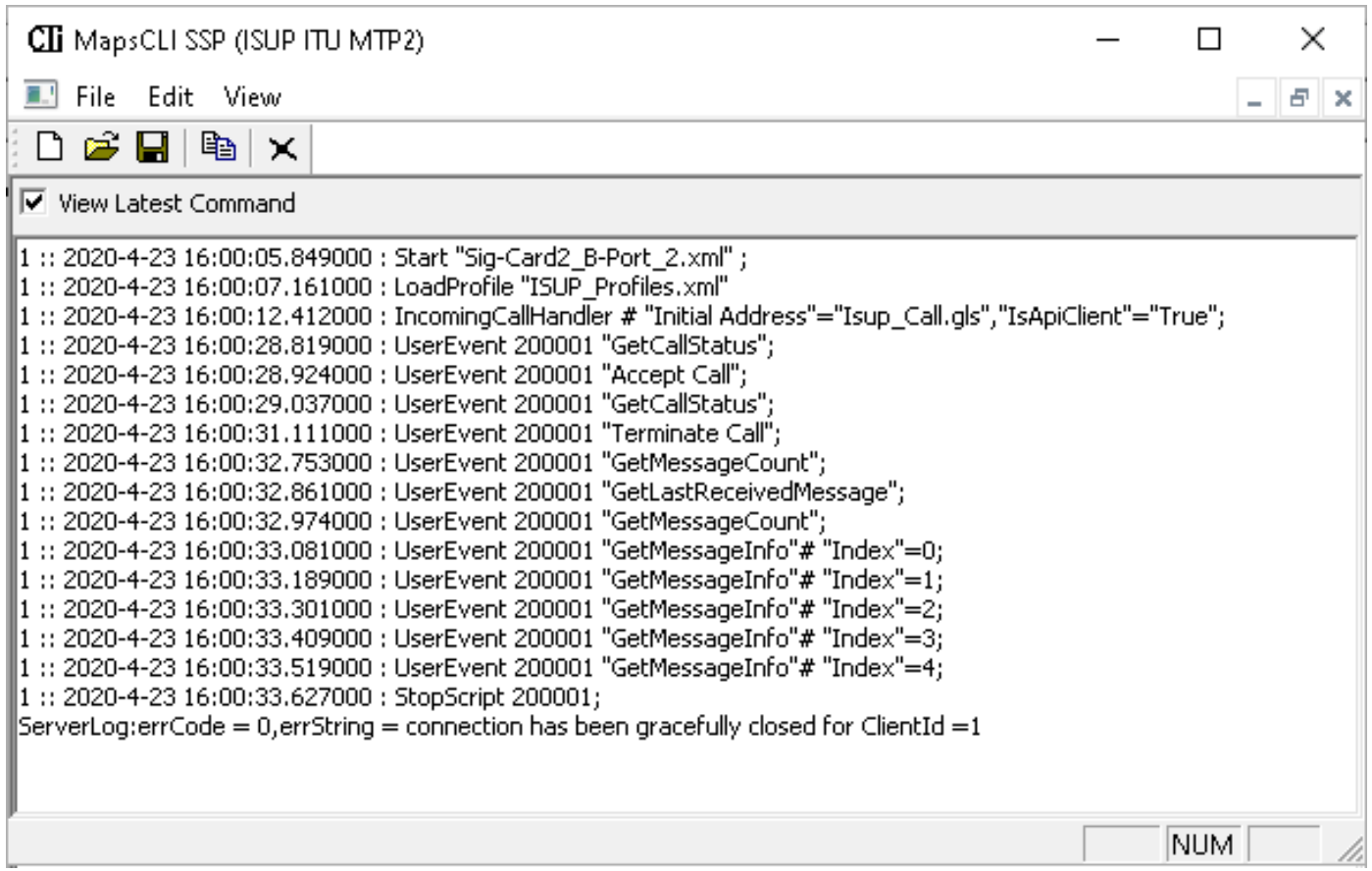
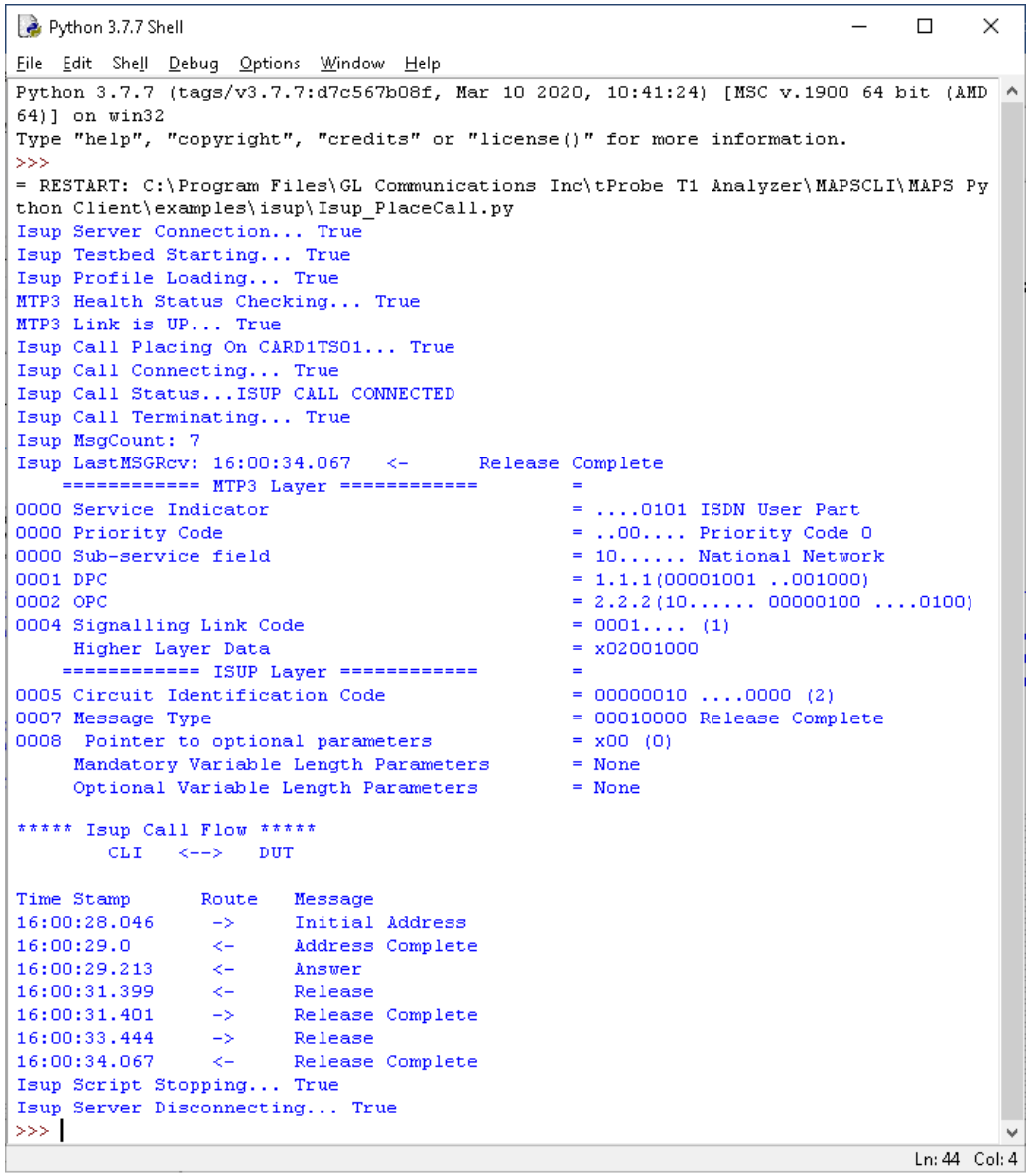
CLI Support

MAPS™ Server



Python Client



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THANK YOU

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