MAPS™ GSM A Interface Emulator

GSM A Interface Emulation Over IP and TDM

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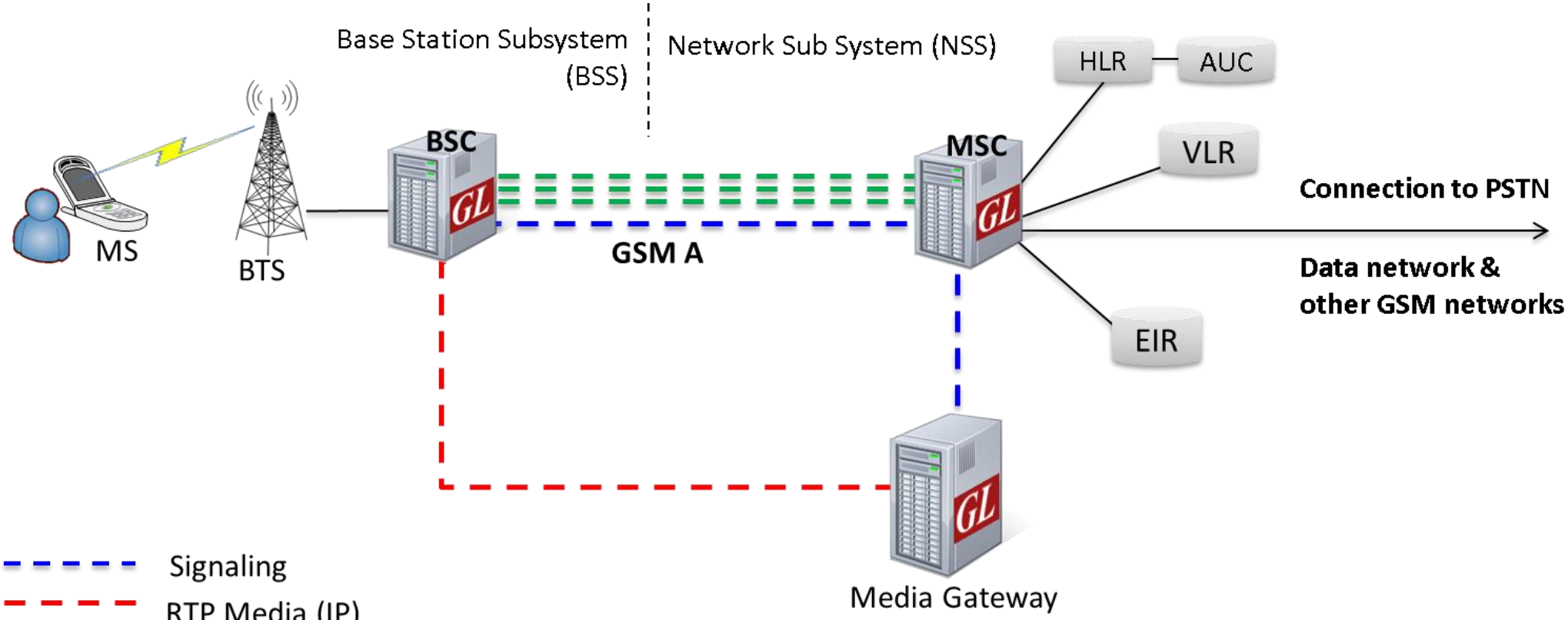
GSM A Interface Emulation



MAPS™ GSM A over IP /TDM
(2K simultaneous calls per NIC card)

MAPS™ GSM A over IP
HD RTP Generator Hardware
(w/ 2 x 10G cards; w/ 4 x 1G cards)

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Main Features

- Complete GSM A signaling emulation over IP along with RTP traffic
- Supports transmission and detection of RTP traffic – Auto digits, voice file, single /dual tones, Fax, IVR, and User defined traffic
- Access to all BSSMAP and DTAP message parameters like TMSI, IMSI, CIC, MCC, LAC, and more
- User controlled access to optional parameters such as timers
- Supports Authentication, TMSI Reallocation, Encryption, and other optional procedures
- Ready scripts for Mobile Originating, Mobile Terminating, Location Updating procedures, Mobile Originating and Terminating SMS, and Handover Management procedures
- Auto packet impairment with Latency, Packet Effects, and Packet Loss
- Supported codec types include G.711, G.729, G.726, GSM, AMR, EVRC, SMV, iLBC, SPEEX, G.722, and more. *AMR, EVRC variants requires additional licenses
- User-friendly GUI for configuring the SCTP/TCP Layer
- HD appliance supports high density call emulation of up to 20,000 calls with traffic (5000 calls per port) – Requires additional hardware and licenses

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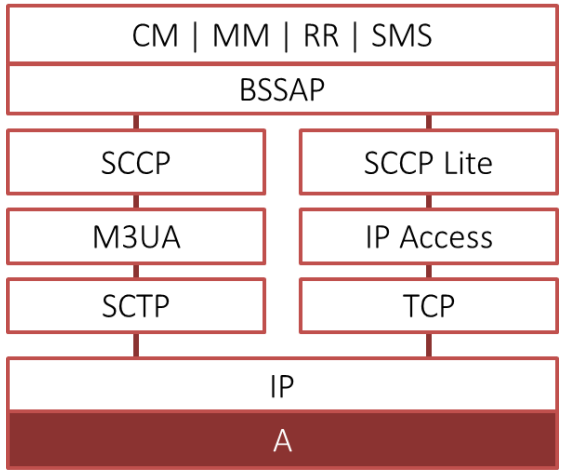
Main Features(Contd.)

- Setup a virtual real-time GSM network emulating all the network elements using ‘2G and 2.5G GSM GPRS Communications Network Lab Suite ’
- Supports all Call Control, Mobility Management, Radio Resource Management, SMS (Short Message Service), and Handover Management procedures
- Multiple UE related information can be accessed directly from Database, CSV files, or through regular XML Profiles for bulk call generation
- CSV or Database based profiles support massive number of UE records, and also support SMS calls ratio option to dynamically control the ratio of SMS and Voice calls to be generated
- Supports user defined graphs and statistics for monitoring performance of Signaling and RTP traffic
- Export call statistics PDF and XML file format report generation
- Customization of traffic parameters to be calculated and displayed for voice quality metrics such as Listening MOS, Conversational MOS, Packet Loss, Discarded Packets, Out of Sequence Packets, Duplicate Packets, Delay and Jitter
- Multi homing with multiple IP address configuration for single node is supported to keep the SCTP link continuously active between the connected nodes

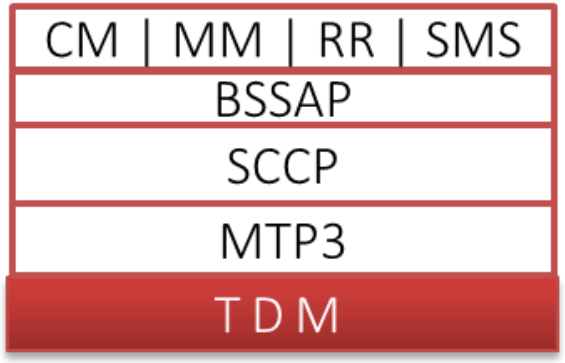
Supported Protocol Standards

GSM A IP Interface Protocol Standards



Supported Protocols	Standard / Specification Used
SCCP	Q.713, CCITT (ITU-T) Blue Book
SCTP	RFC 4960
TCP	RFC 793
M3UA	RFC 3332
BSSMAP / DTAP	3GPP TS 08.08 V8.9.0, 3GPP TS 48.008 V10.0.0 (2011-01)
MM/CC	3GPP TS 04.08 V7.17.0
RR	3GPP TS 04.18 V8.13.0
SMS	3GPP TS 03.40 V7.5.0 & 3GPP TS 04.11 V7.1.0 GSM 03.38 version 7.2.0 Release 1998

GSM A TDM Interface Protocol Standards



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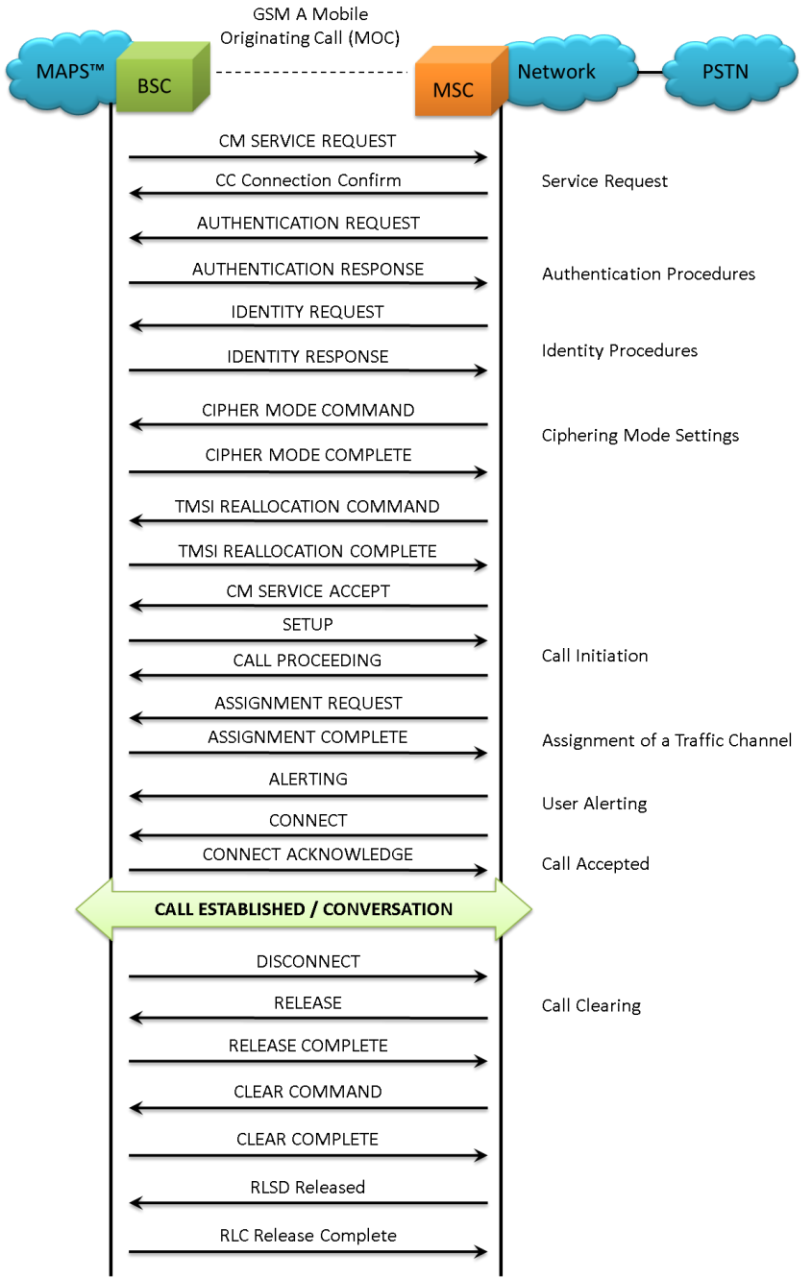
Mobile Originating Call (MOC) Procedure



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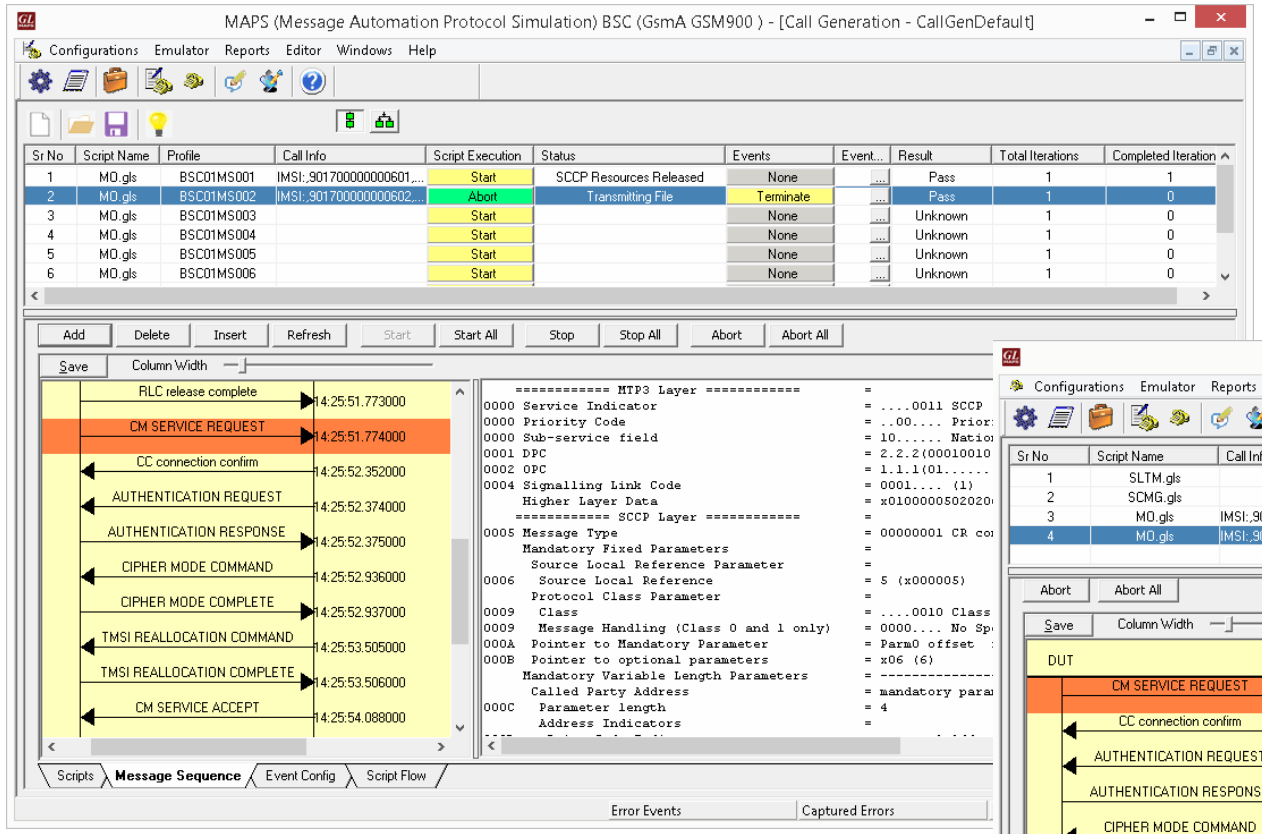
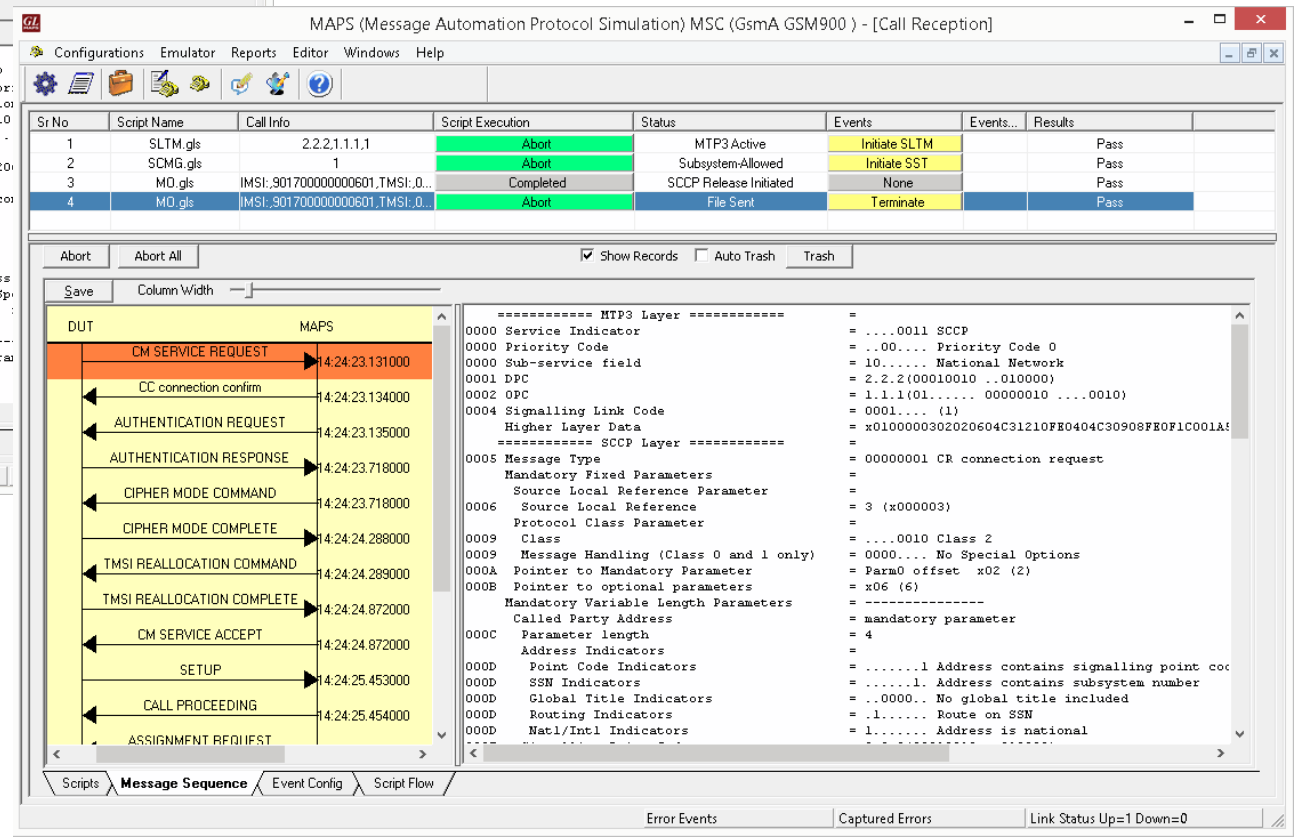
MOC Call Generation and Reception





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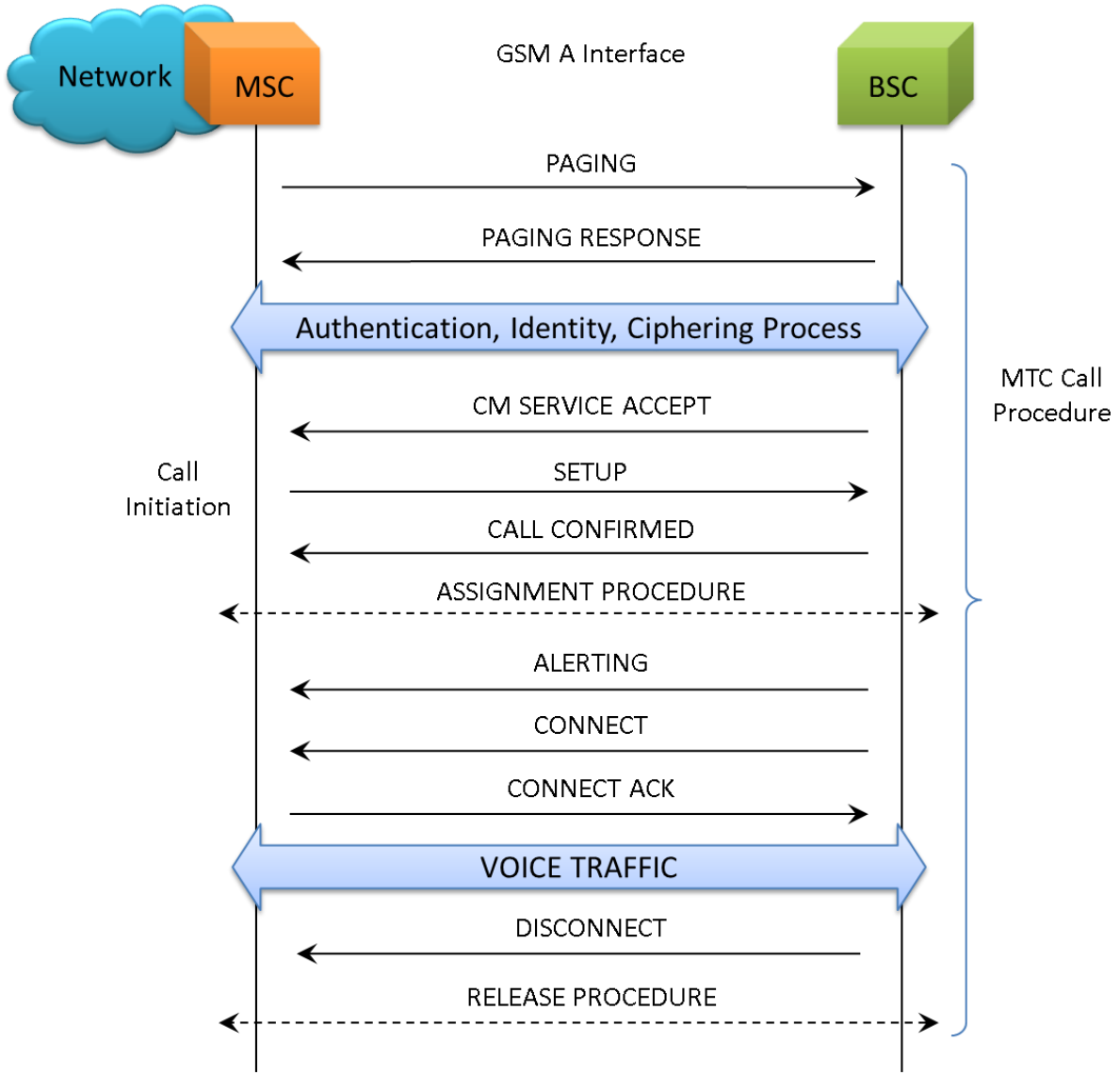
Mobile Terminating Call (MTC) Procedure



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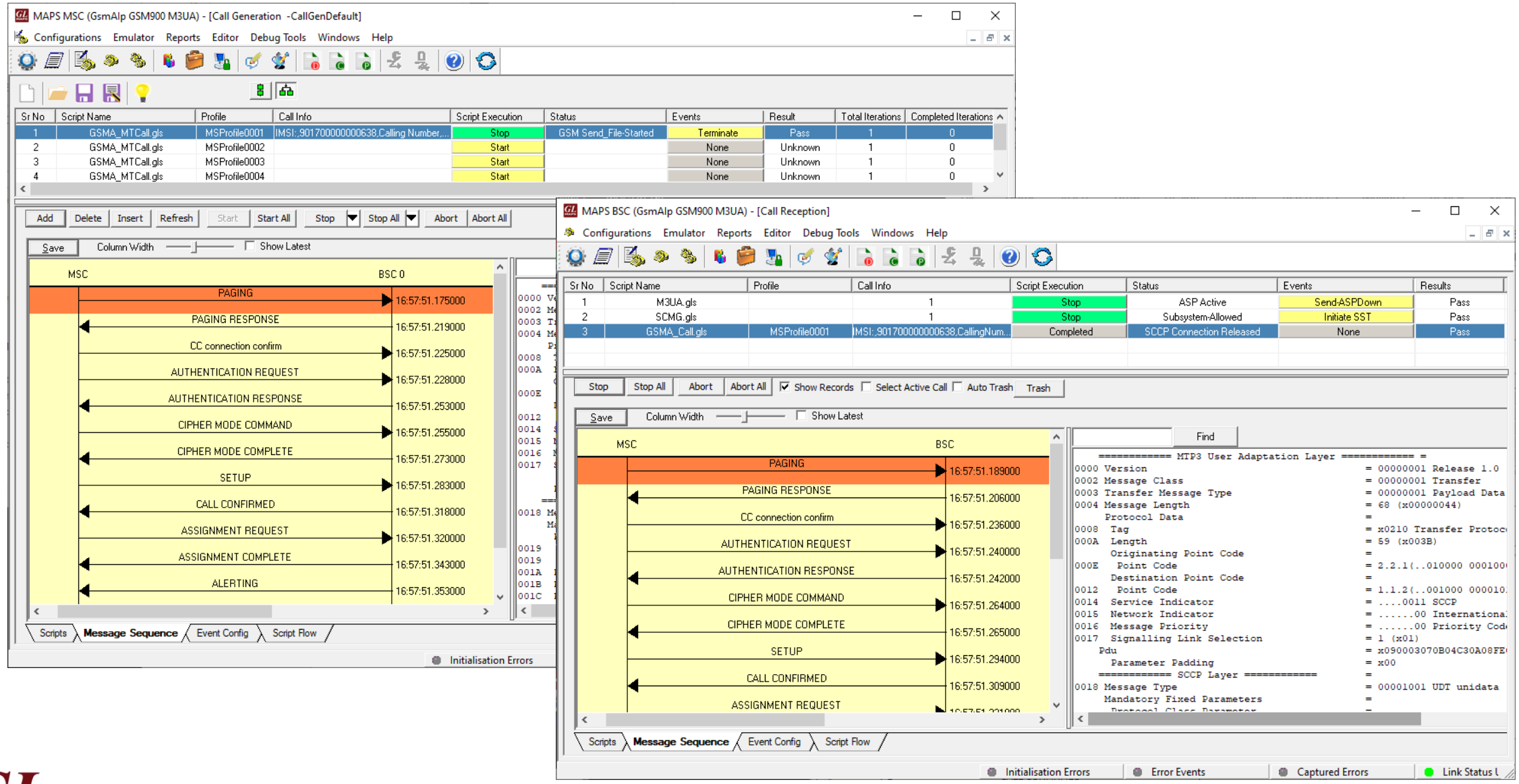
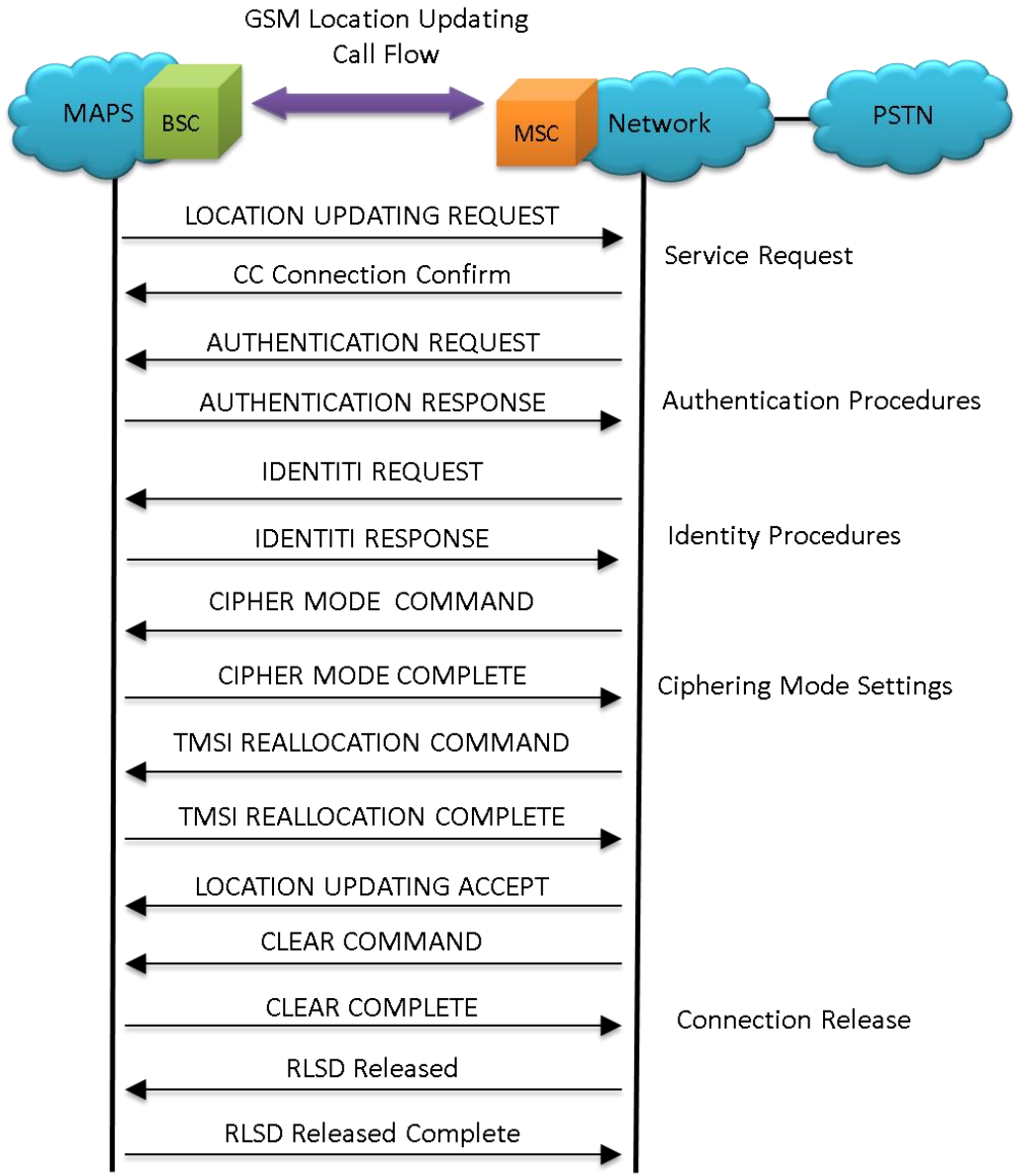
MTC Call Generation and Reception



Location Updating Call (LUC) Procedure



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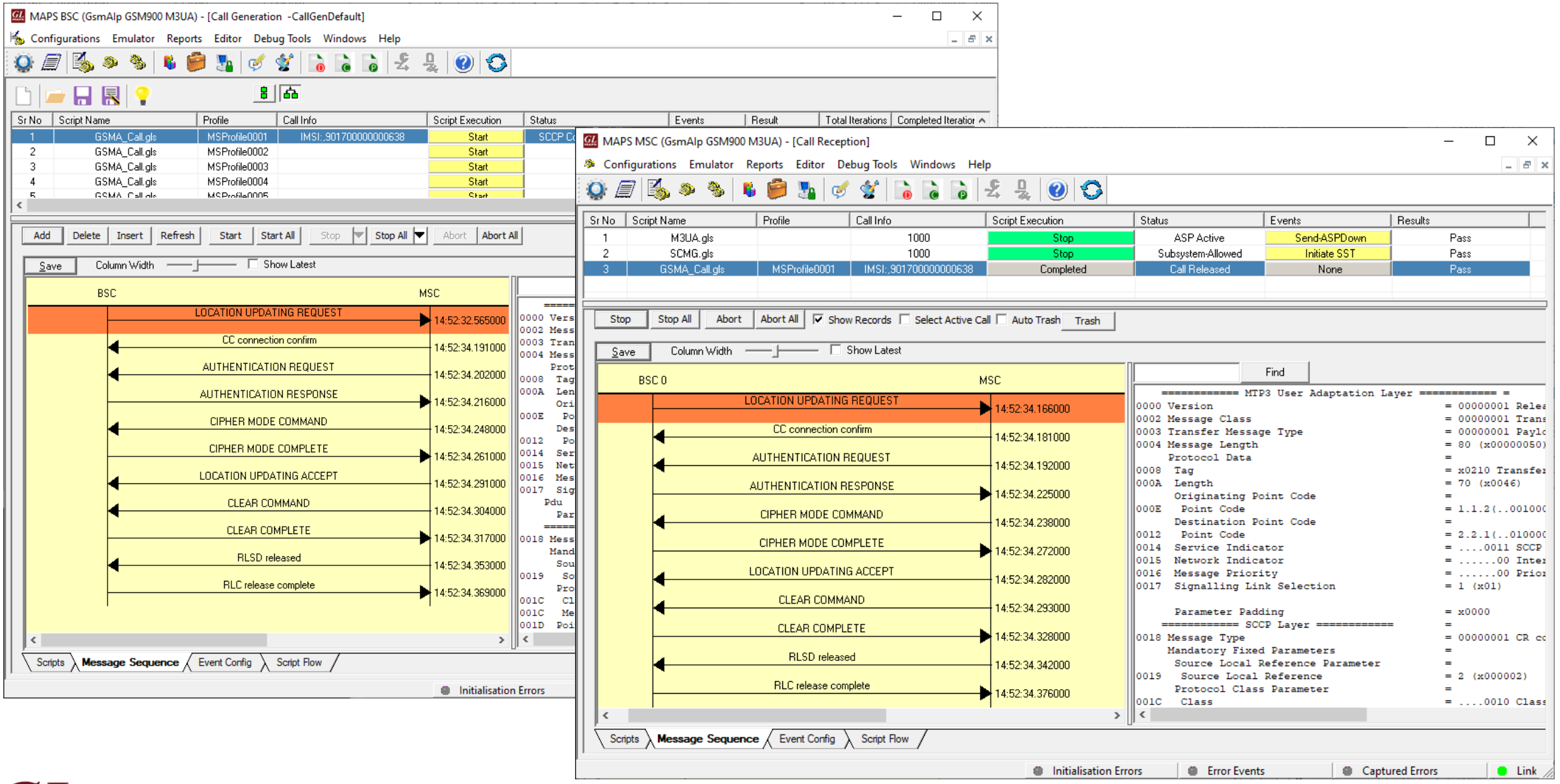
LUC Call Generation and Reception



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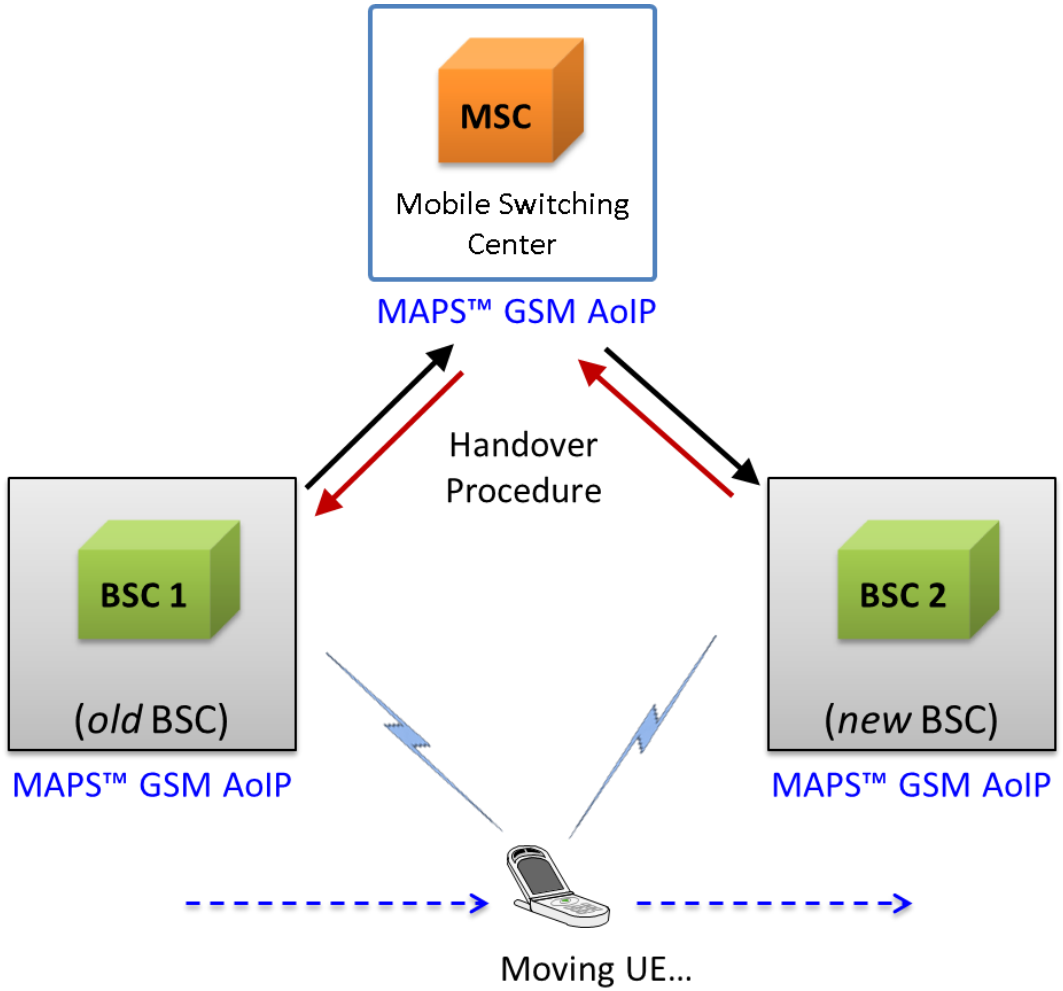
Handover Management Procedure

- When a mobile user travels across two different cell coverage areas within an active call duration, the call is transferred to the new cell's base station
- When the user is travelling across two different cell coverage areas, the Handover procedures are initiated from old BSC to new BSC via MSC. These procedures can be emulated using MAPS™ GSMA over IP Emulator



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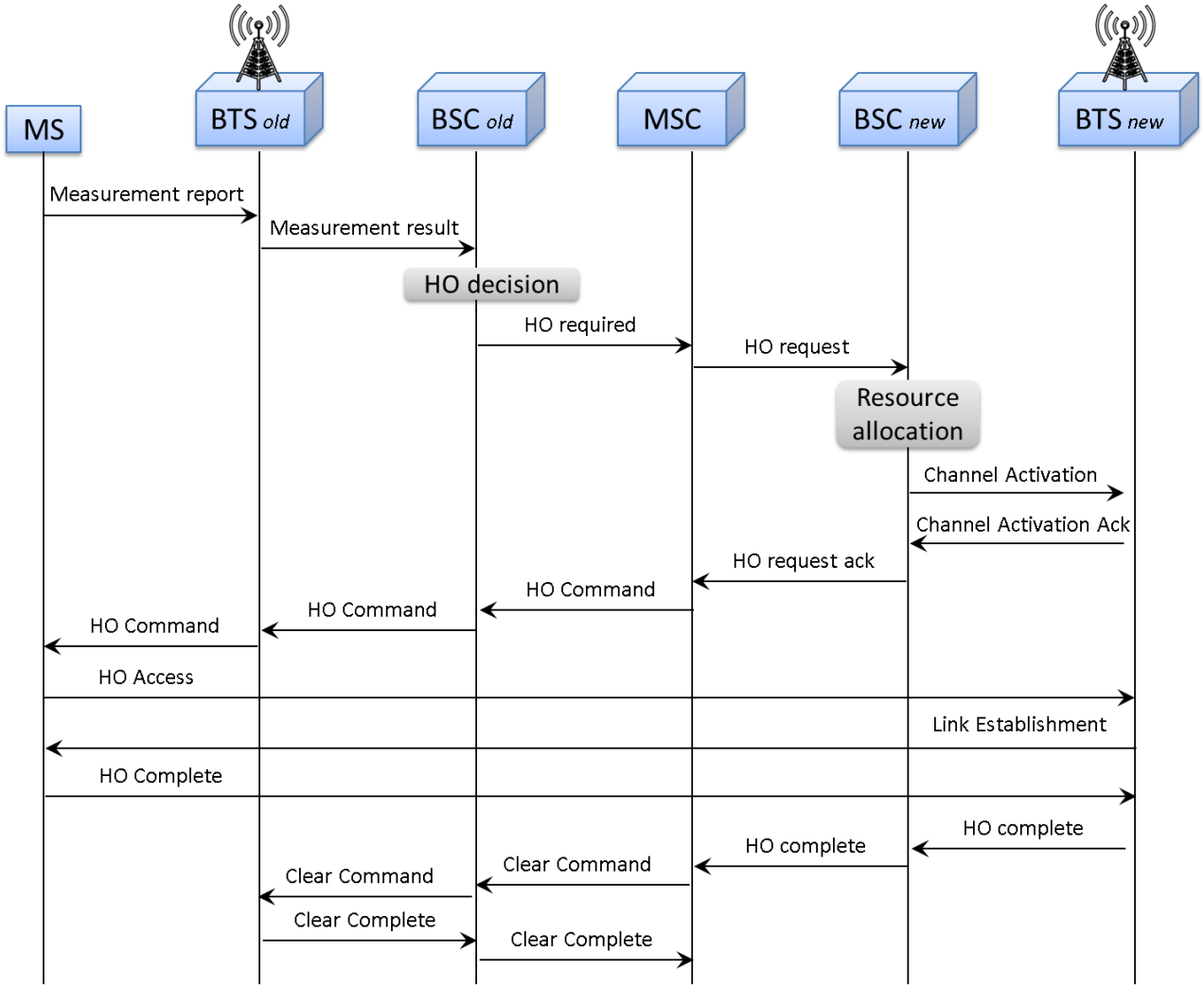
Handover Management Call Procedure

- The typical end-to-end call flow between the entities during the Handover procedure



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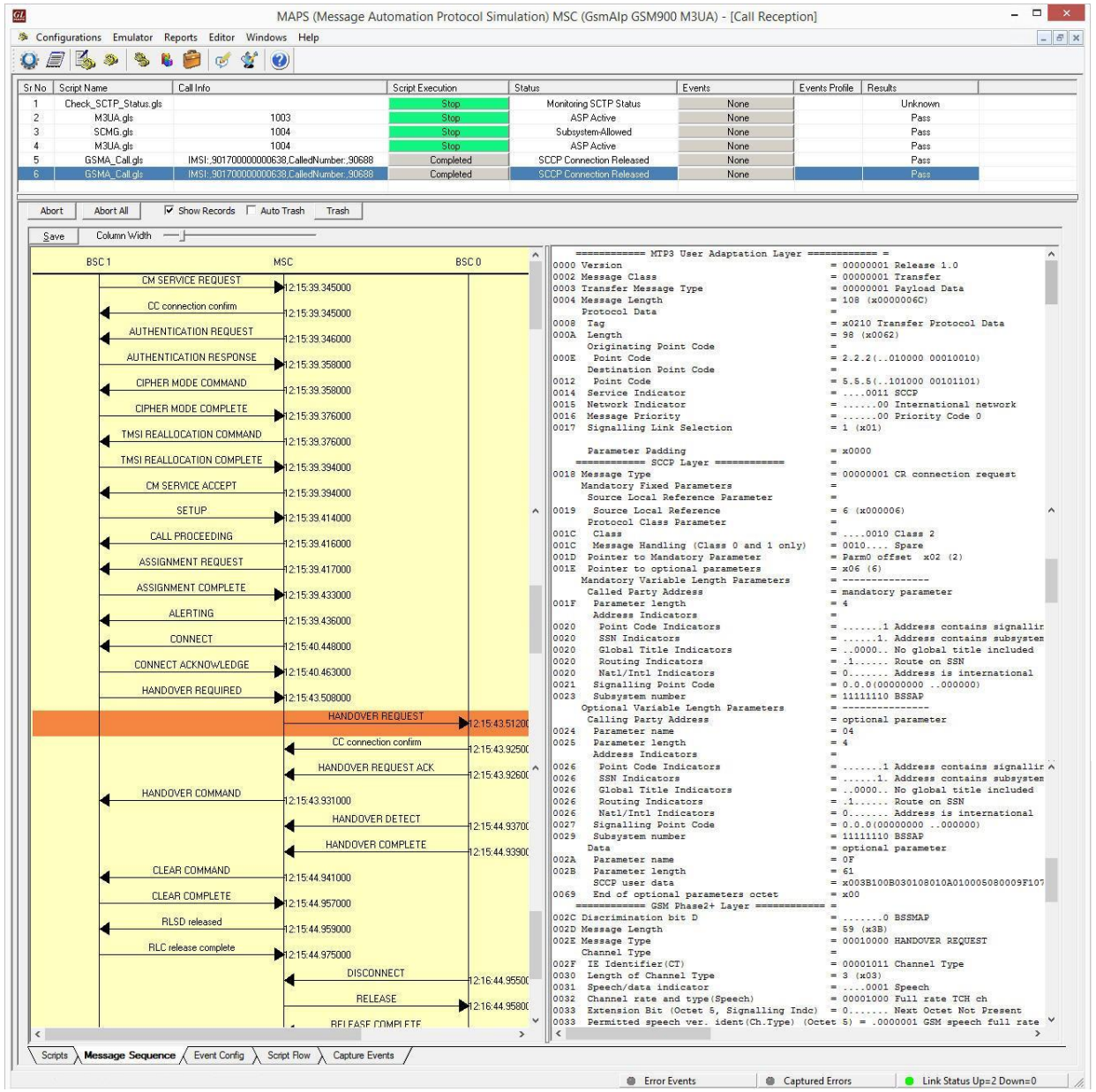
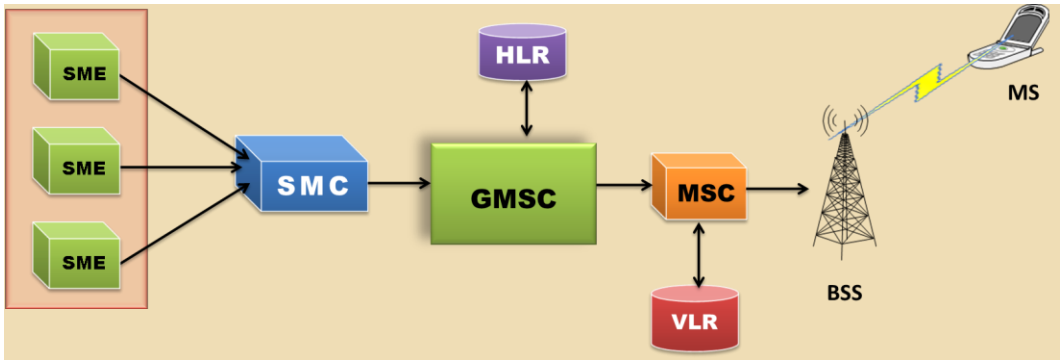
Handover Management Procedure Emulation

- The end-to-end Handover call flow between the old BSC and new BSC via MSC emulated using MAPS™ GSMA over IP Emulator

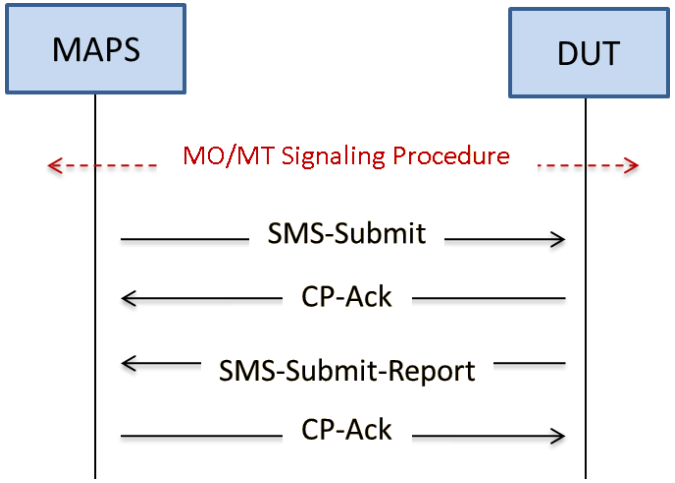


SMS Call Procedure

- Short Message Service (SMS) is a mechanism of short messages delivery over the mobile networks
- It is a store and forward way of transmitting messages to and from mobile phones
- The messages from the sending mobile is stored in a central short message center (SMC) which then is forwarded to the destination mobile



SMS Network



SMS Call Procedure

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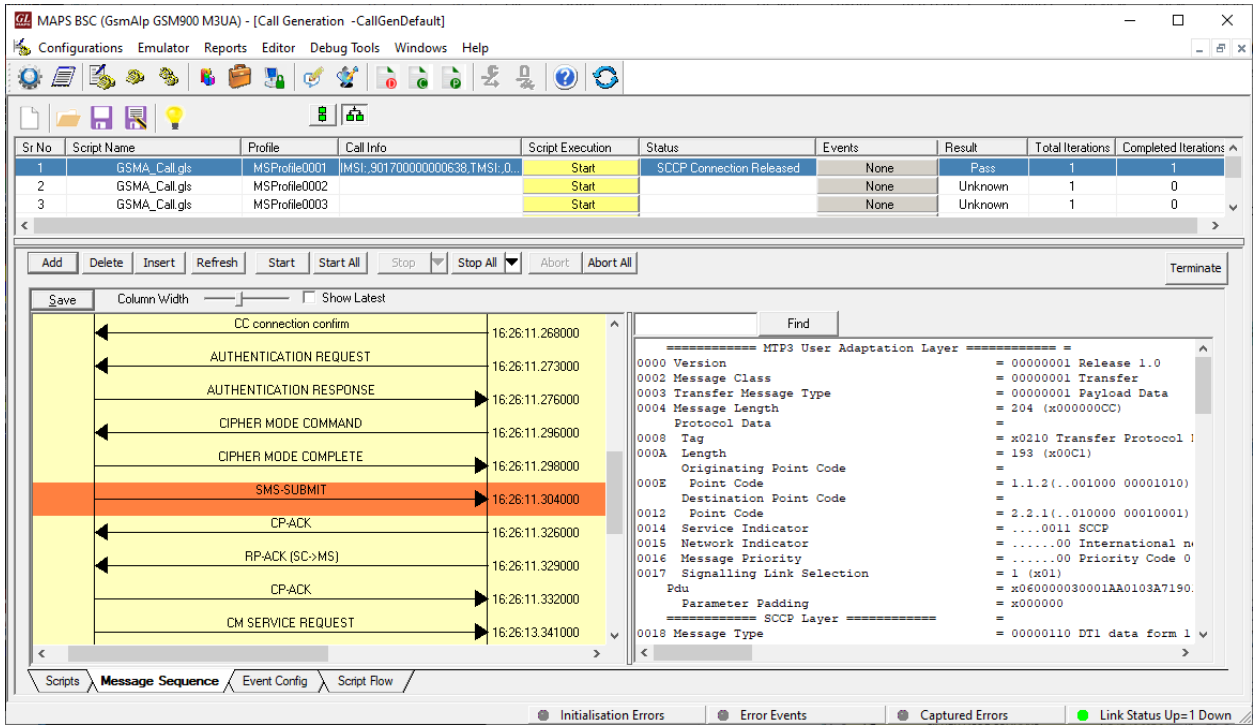
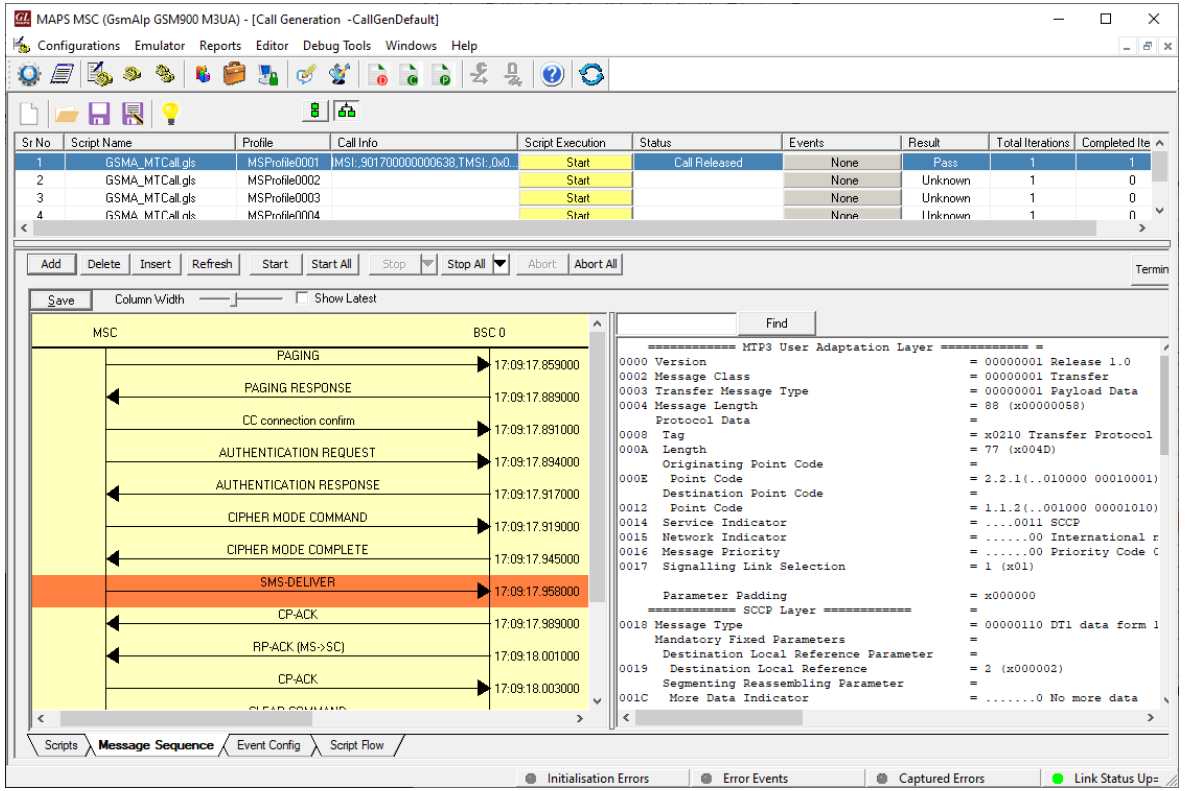
SMS Call Generation and Reception

Mobile Originating SMS Call Generation



Mobile Terminating SMS Call Reception



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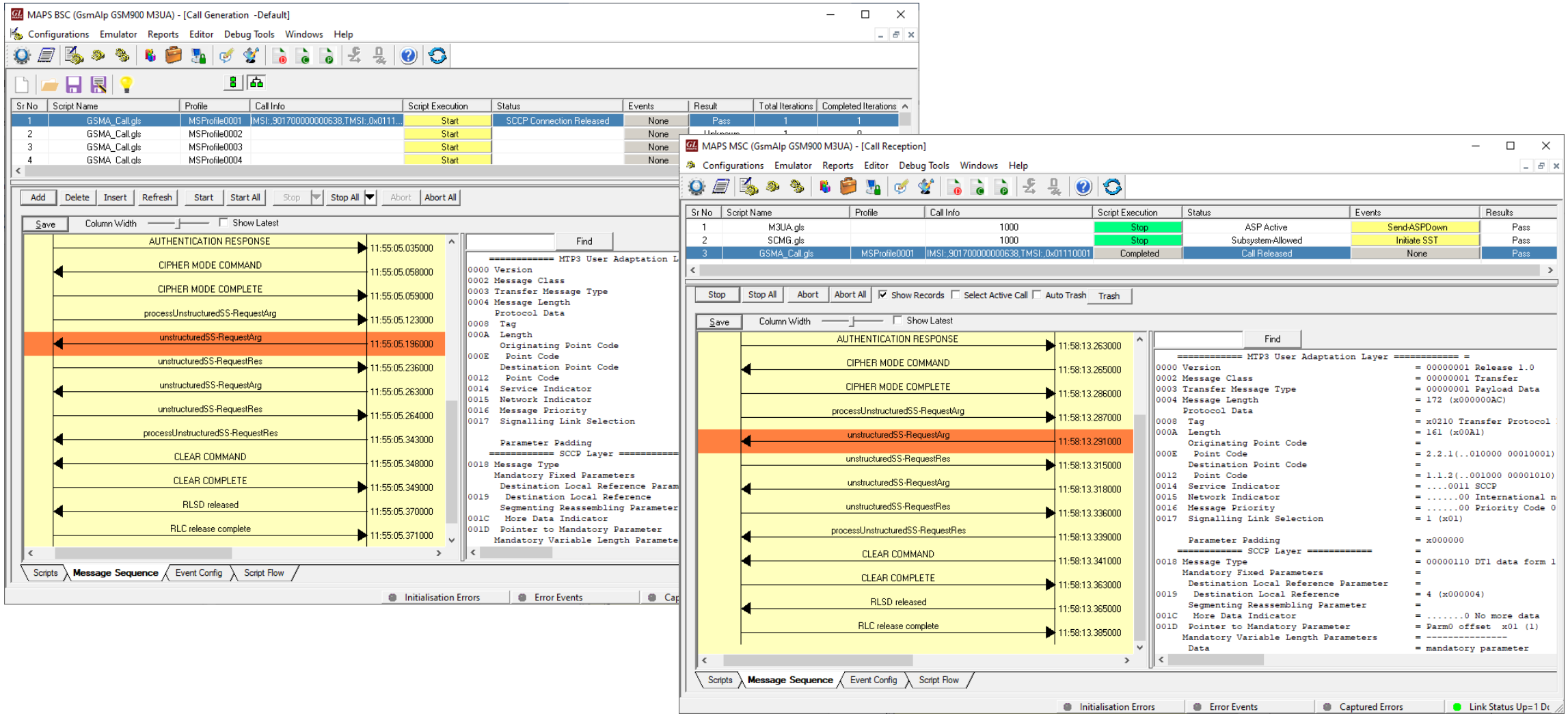
Supplementary Service Call Generation and Reception



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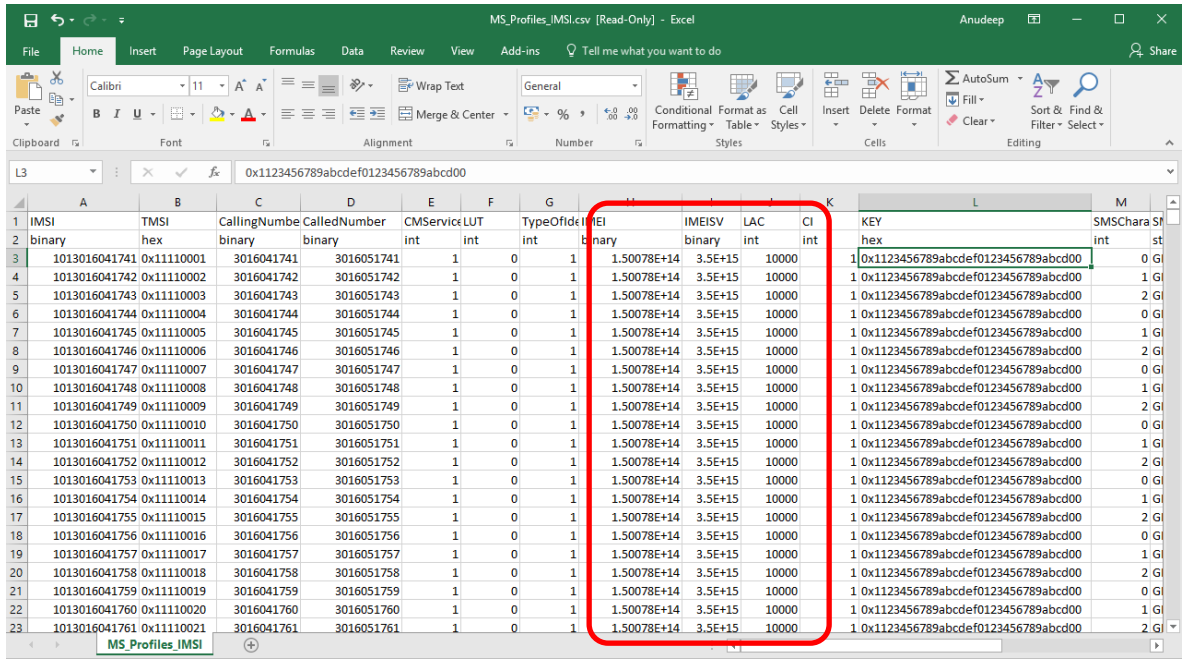
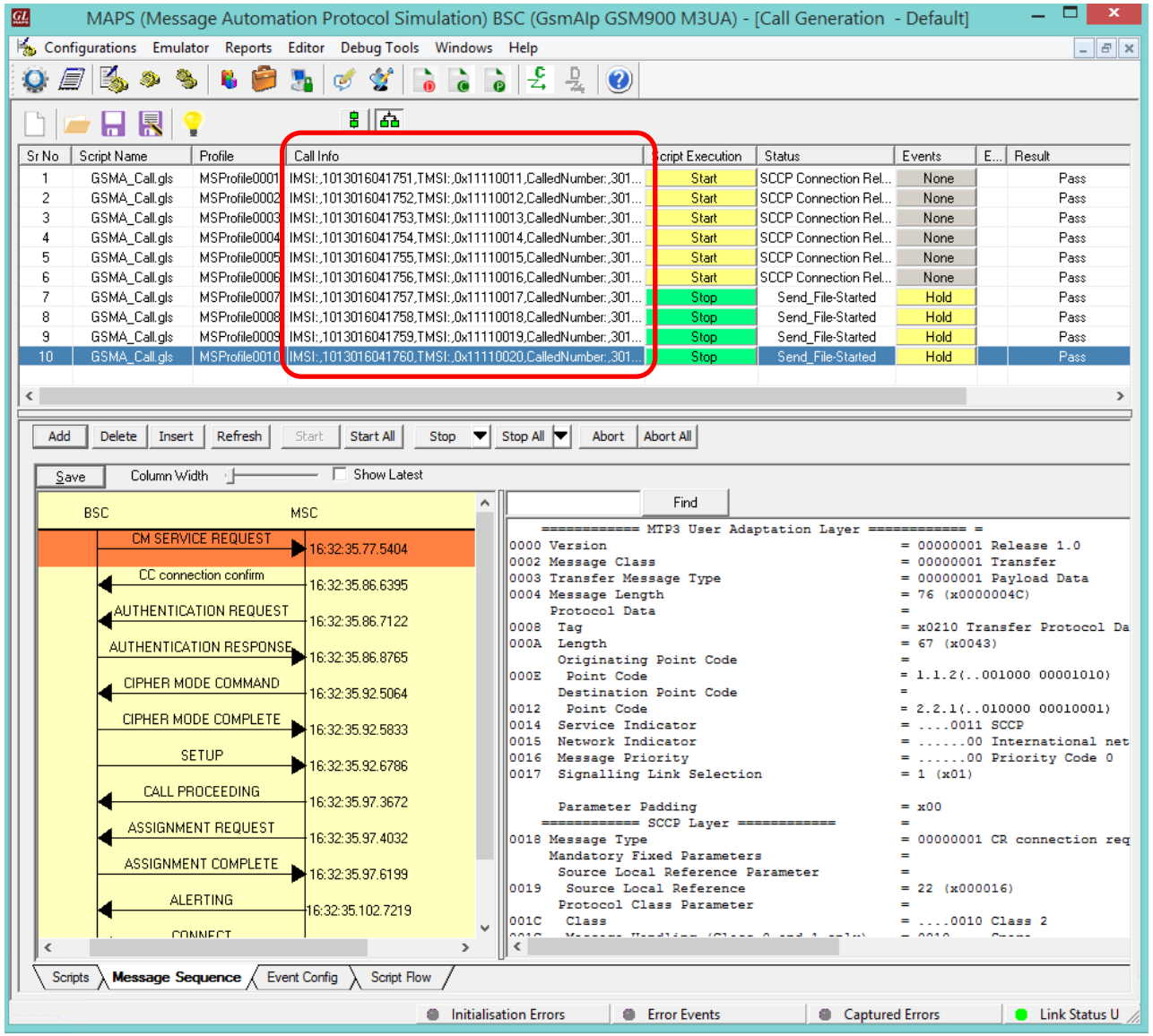
Bulk UE Emulation with CSV based Profiles





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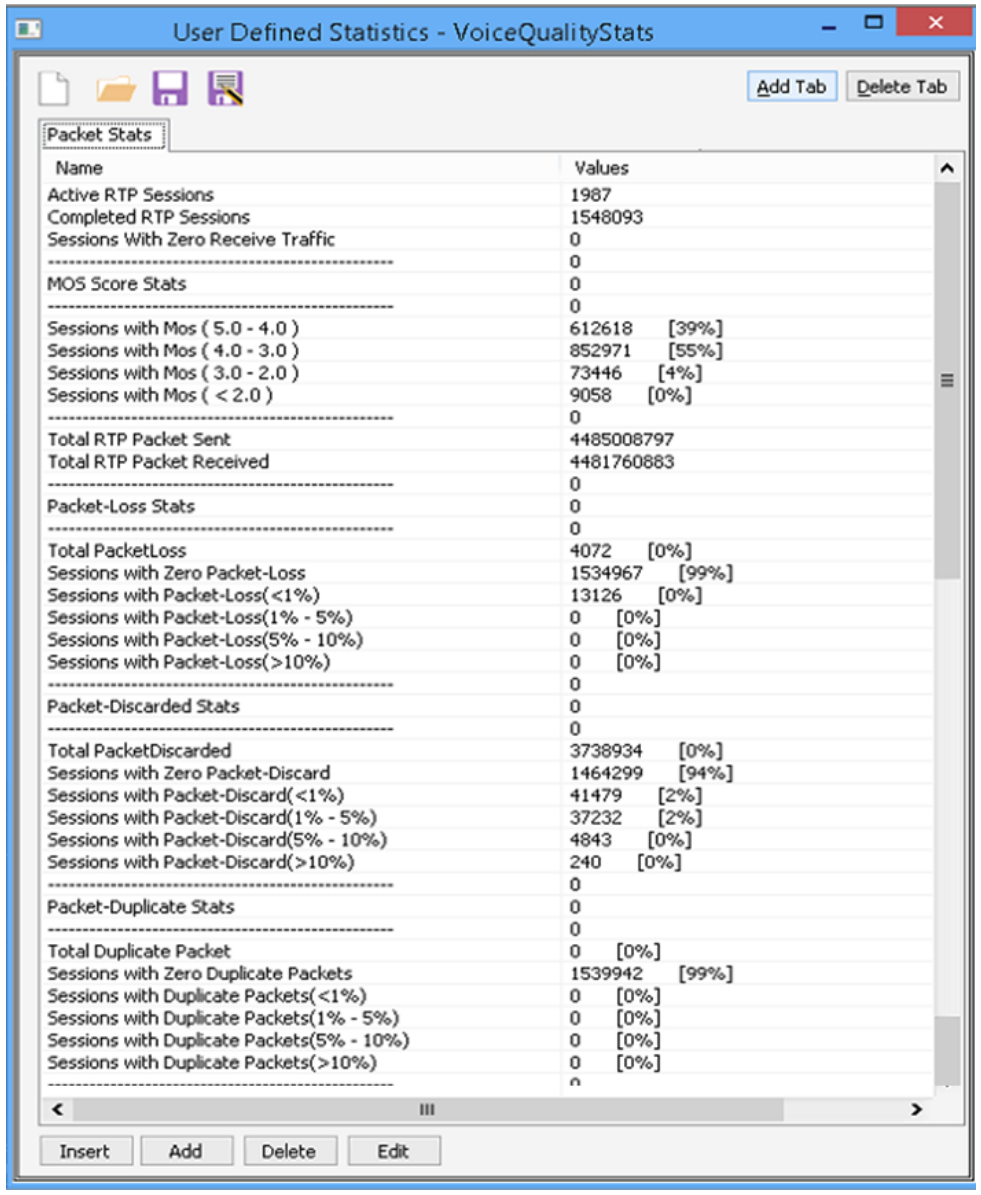
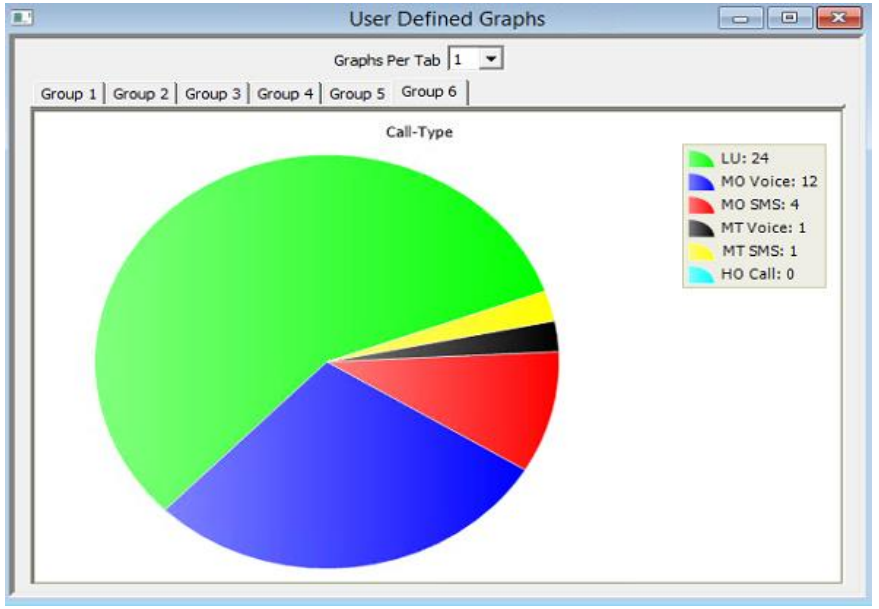
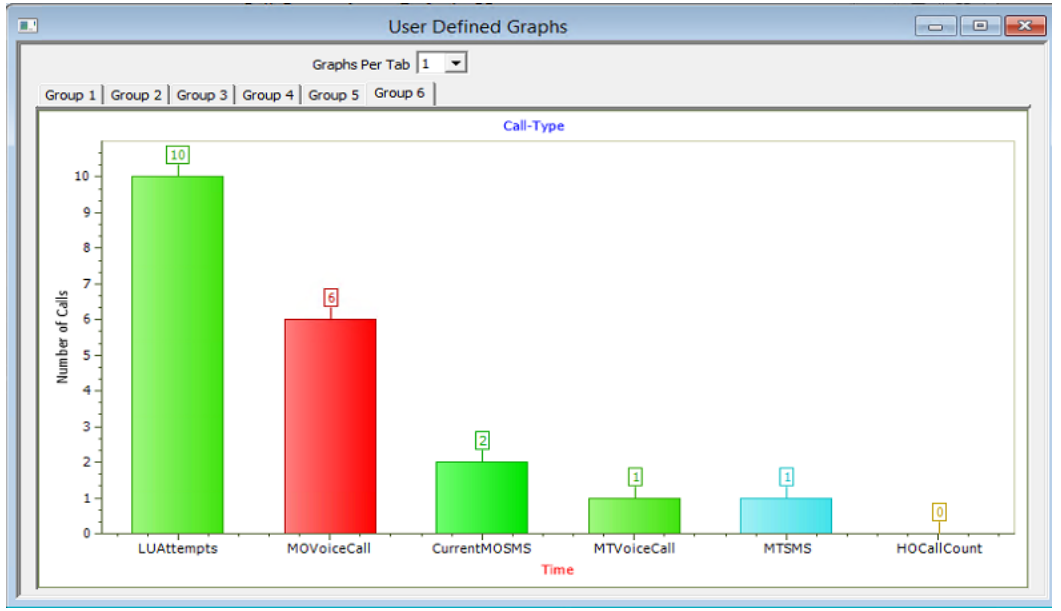
User Defined Graphs and Statistics







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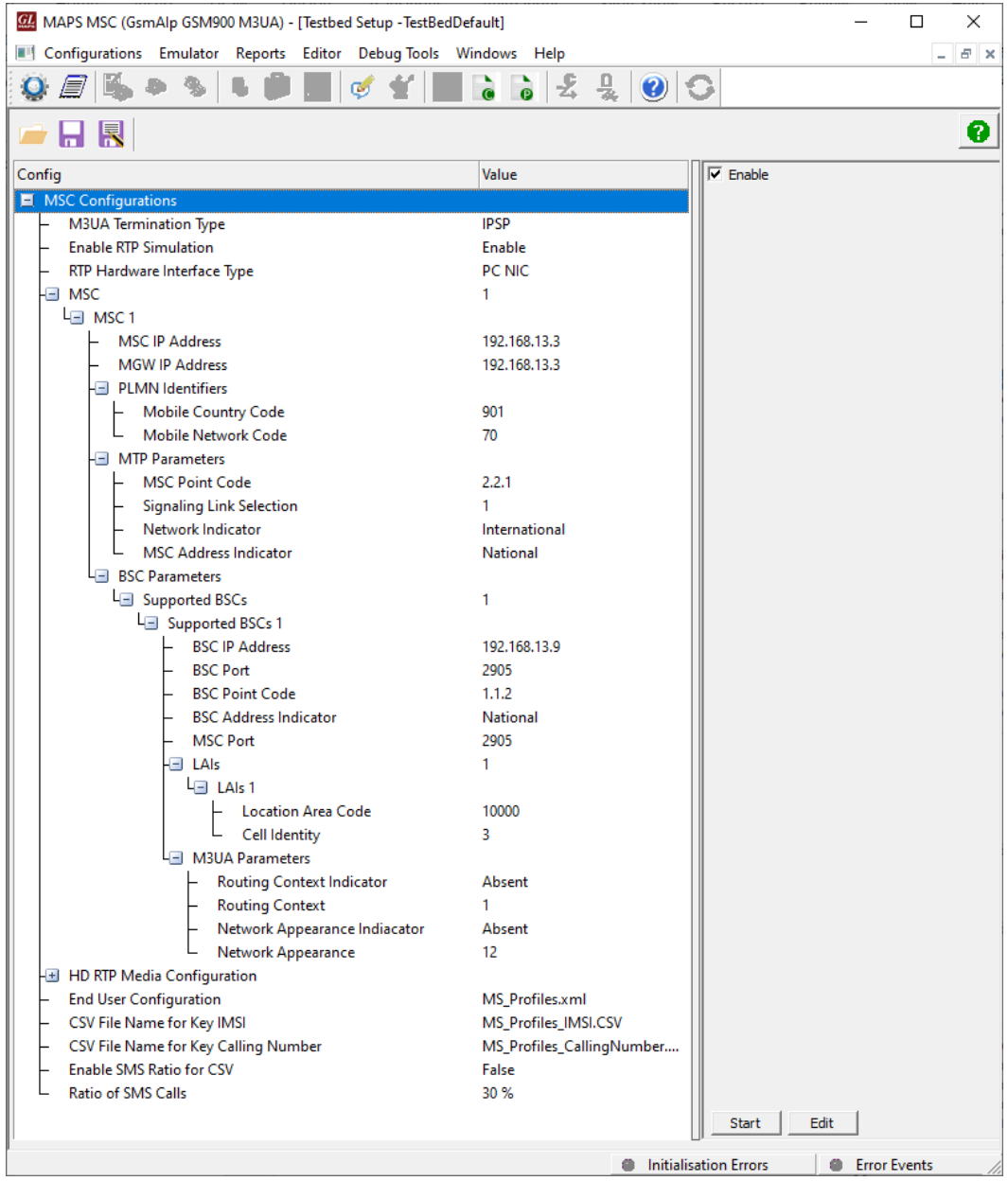
Testbed Configuration



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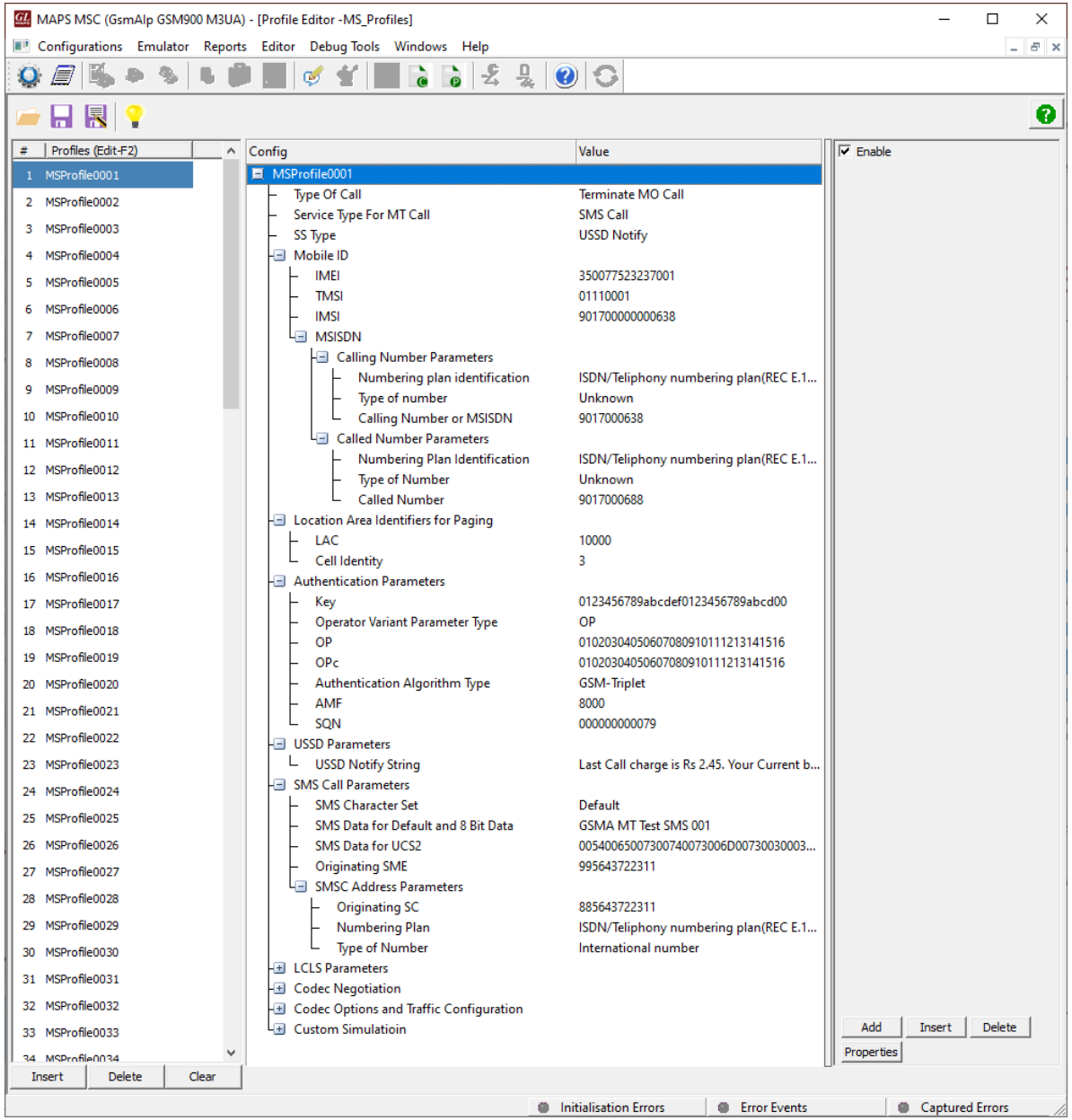
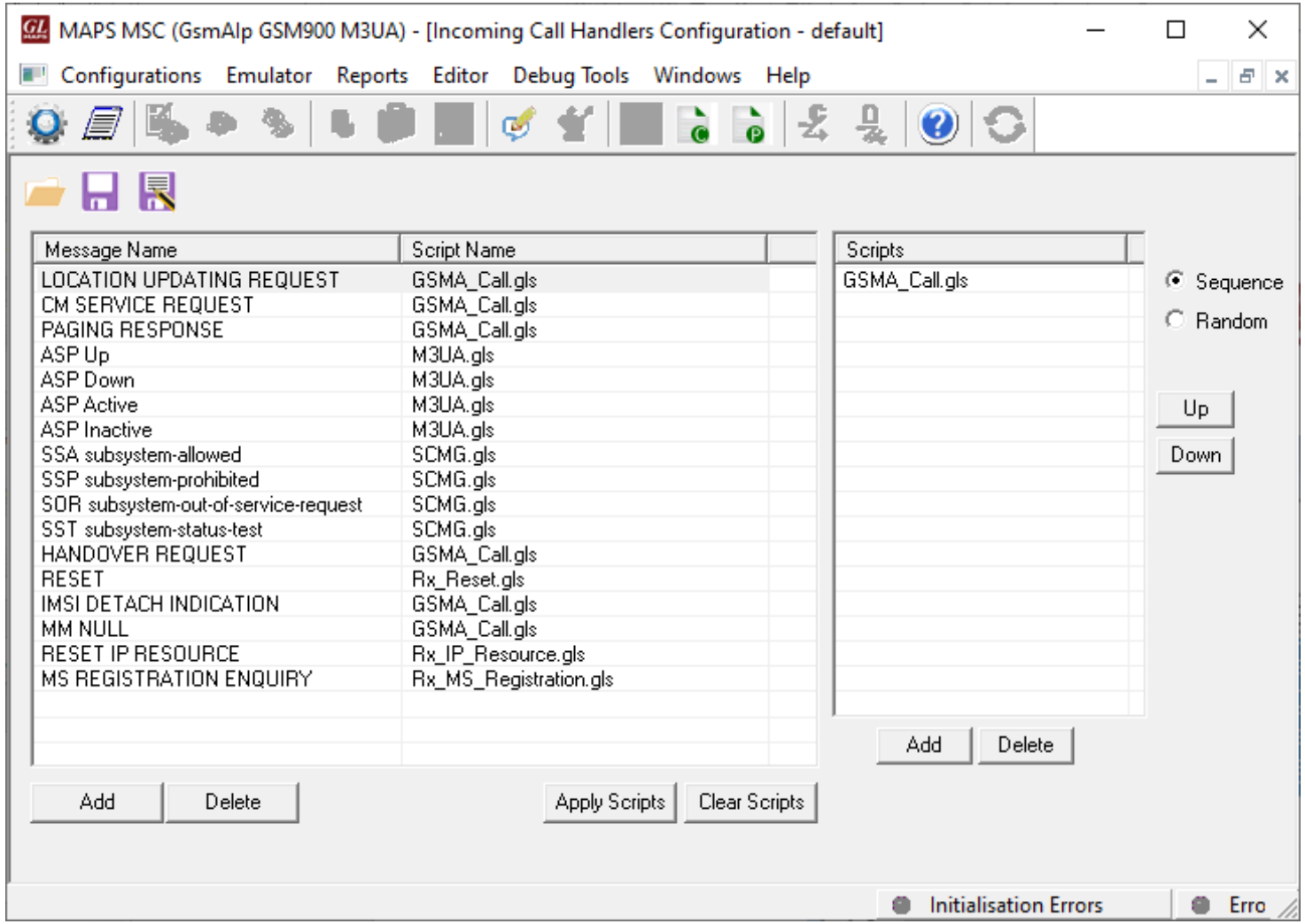
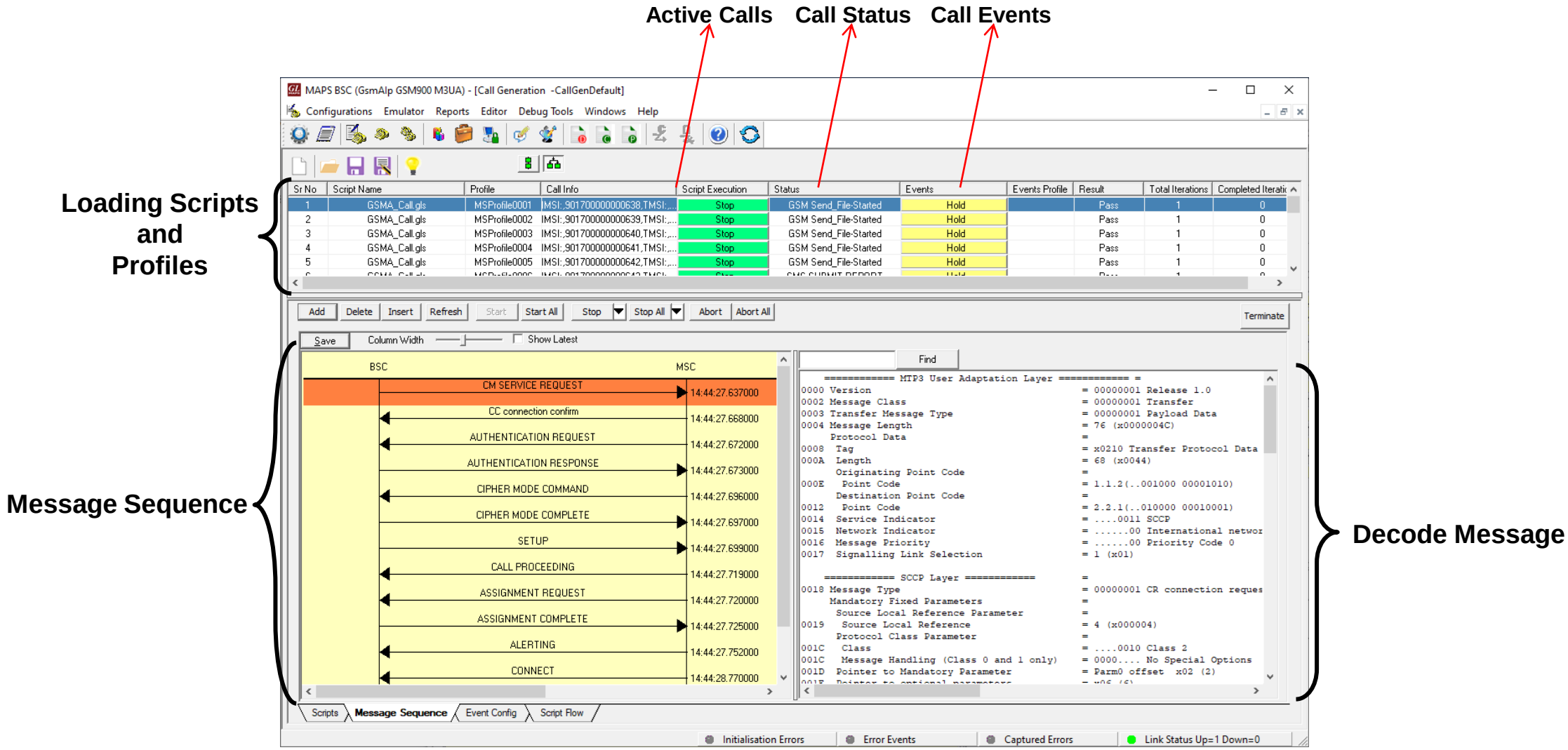
Profile Configuration



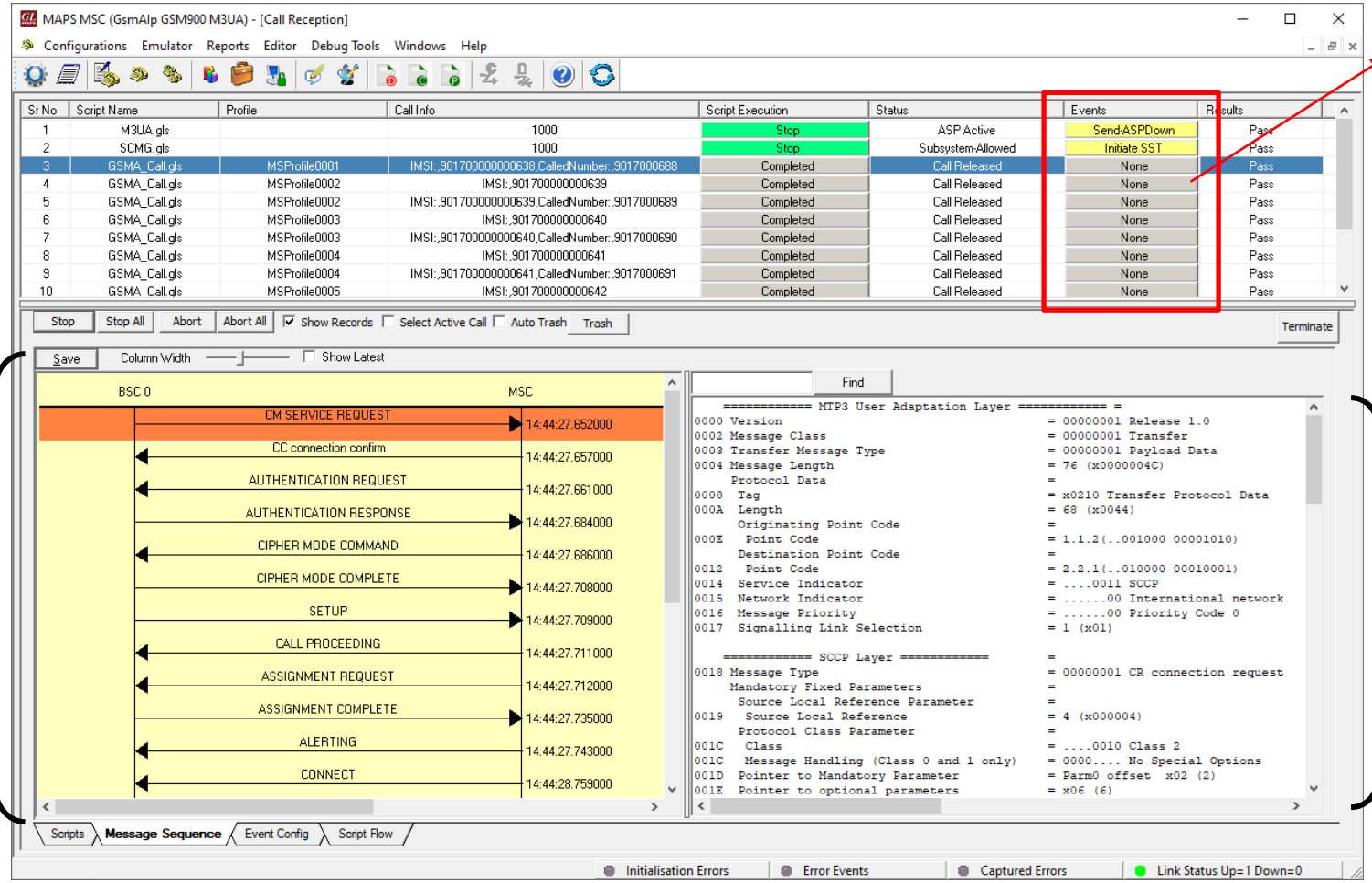
Incoming Call Handler Configuration



GSM A Call Generation



GSM A Call Reception



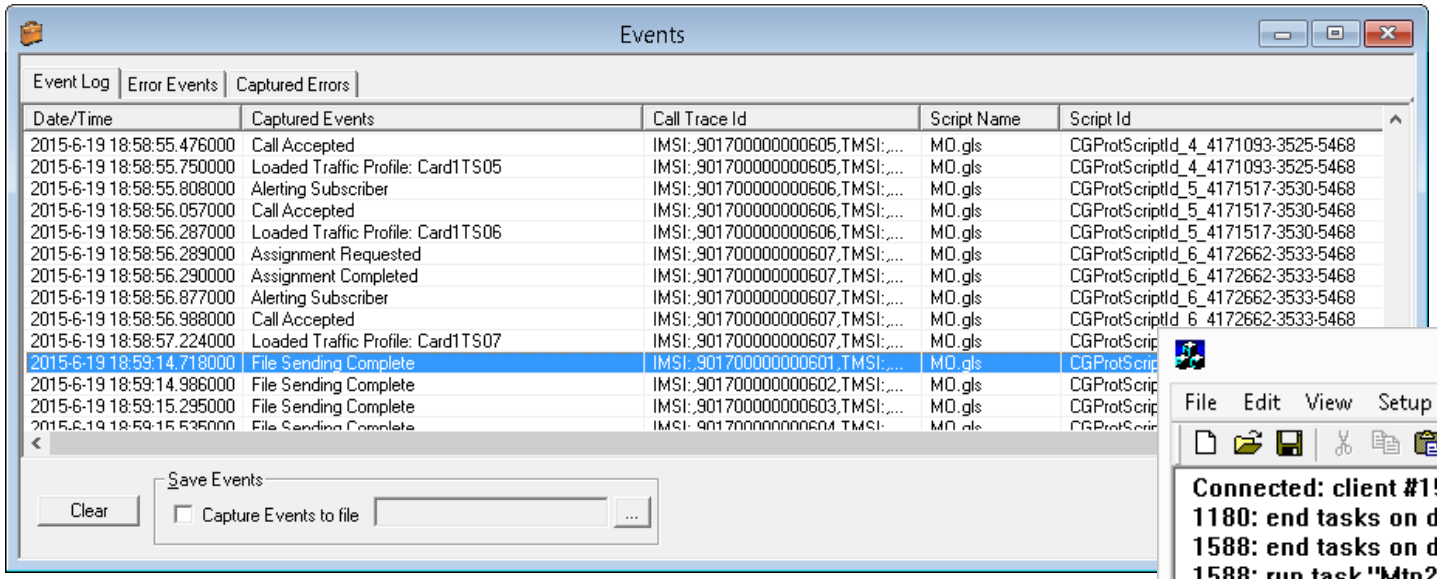
Call Results

Message Sequence

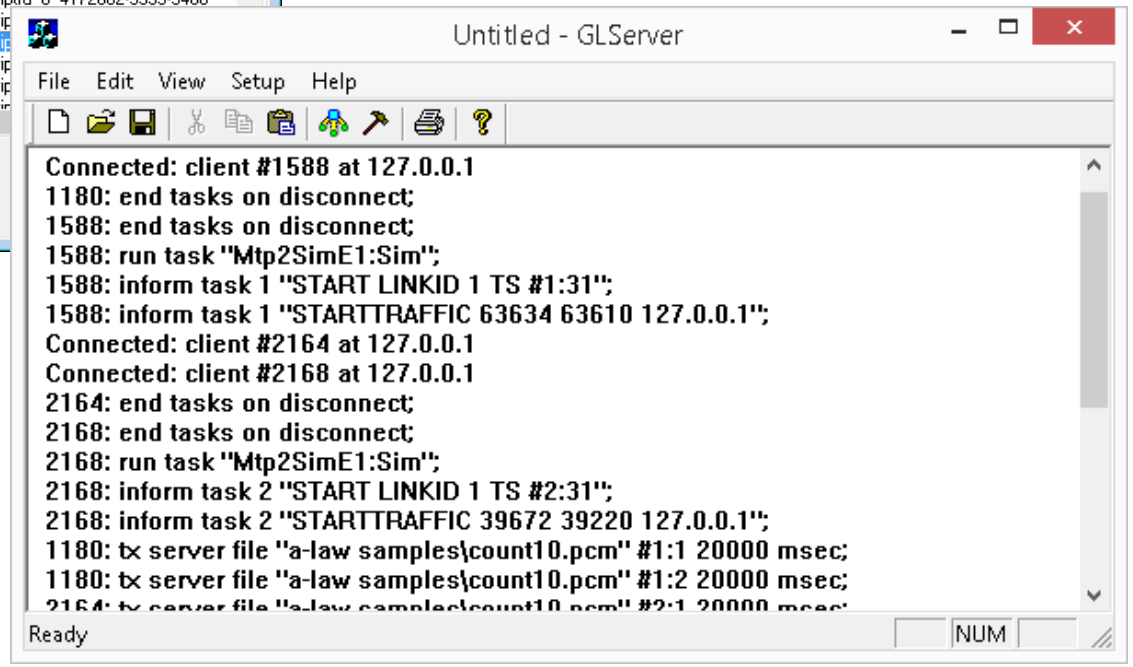
Decode Message

GSM A Call and Server Log

Event Log



WCS Server Log



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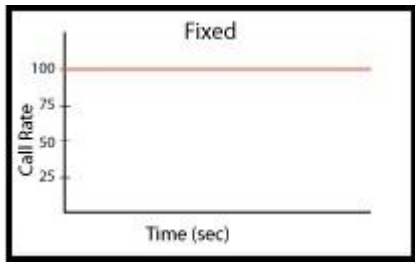
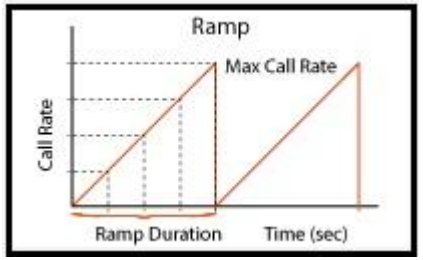
Load Generation

- 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.

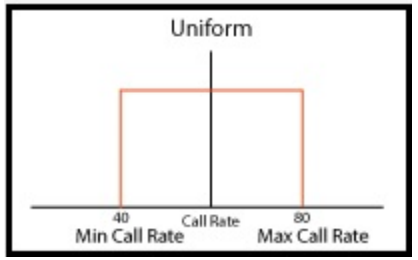
Fixed



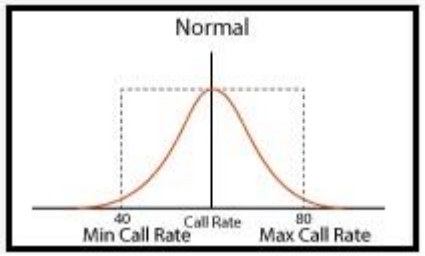
Ramp



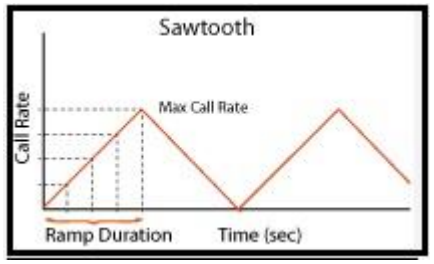
Uniform



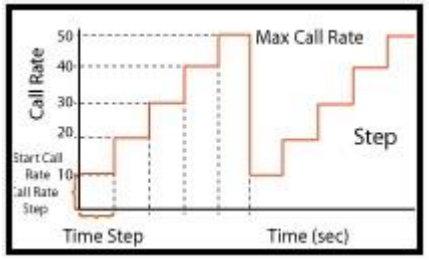
Normal

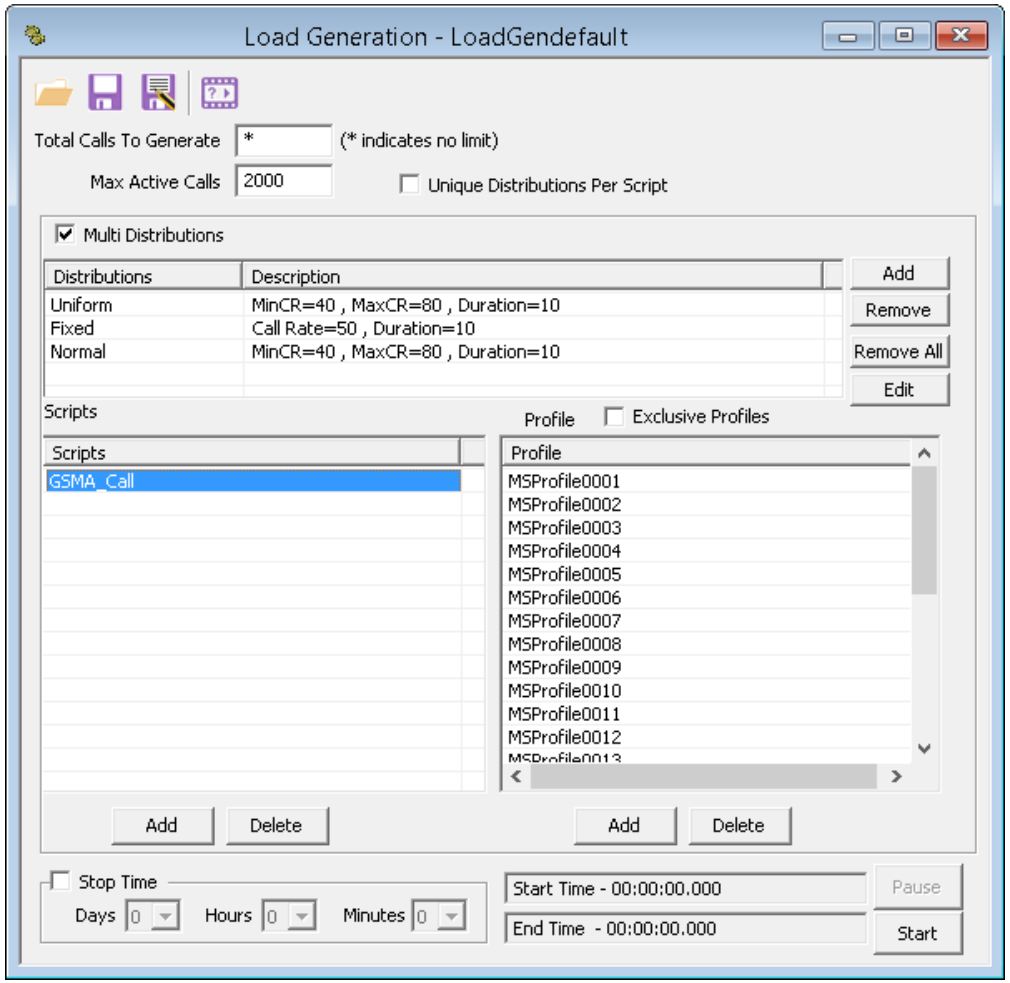


Saw-tooth



Step





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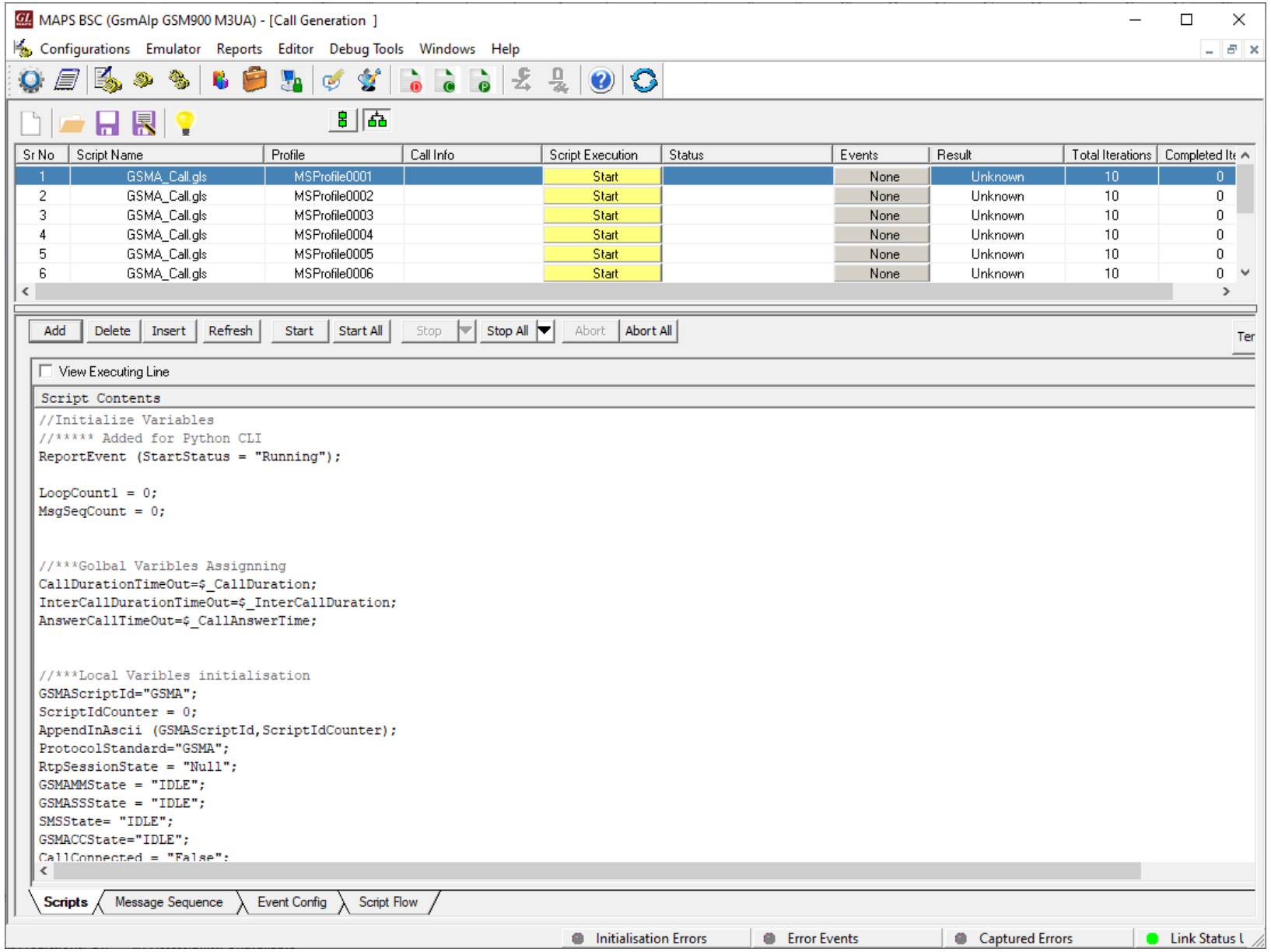
GSM A Bulk Call Generation



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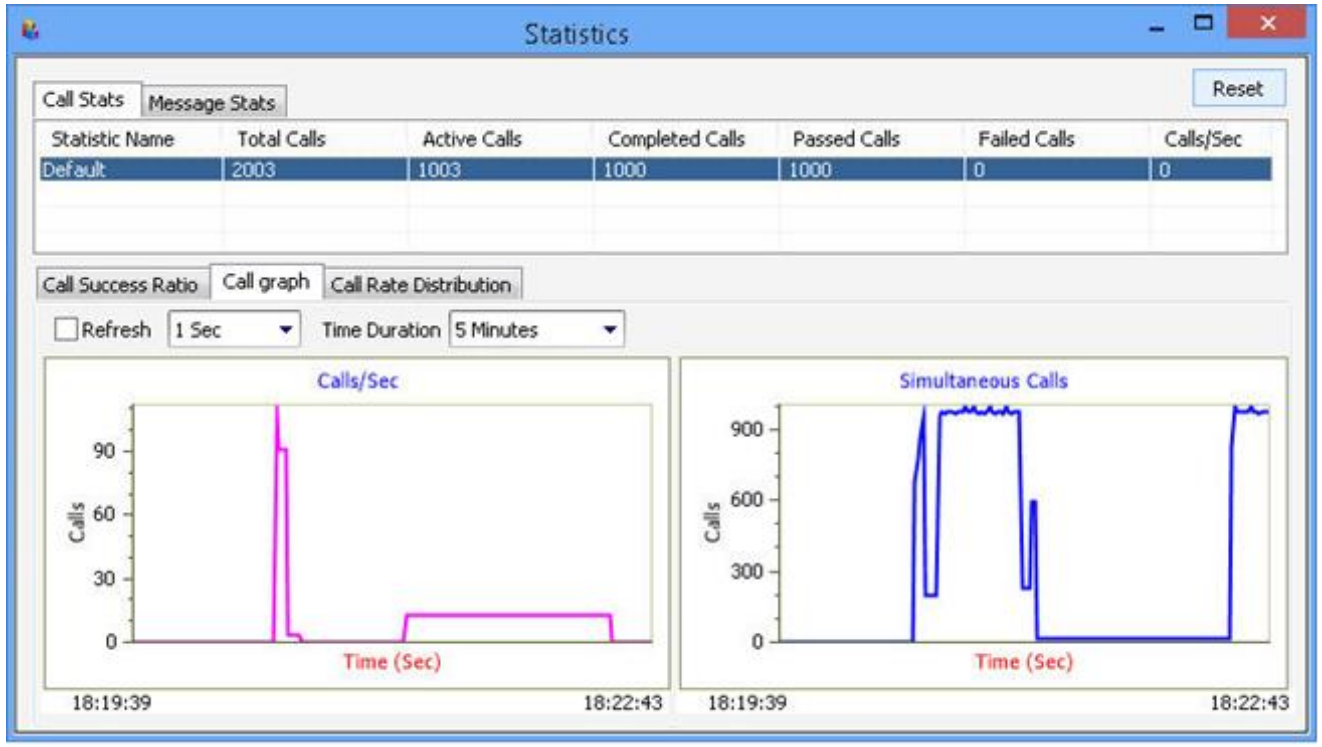
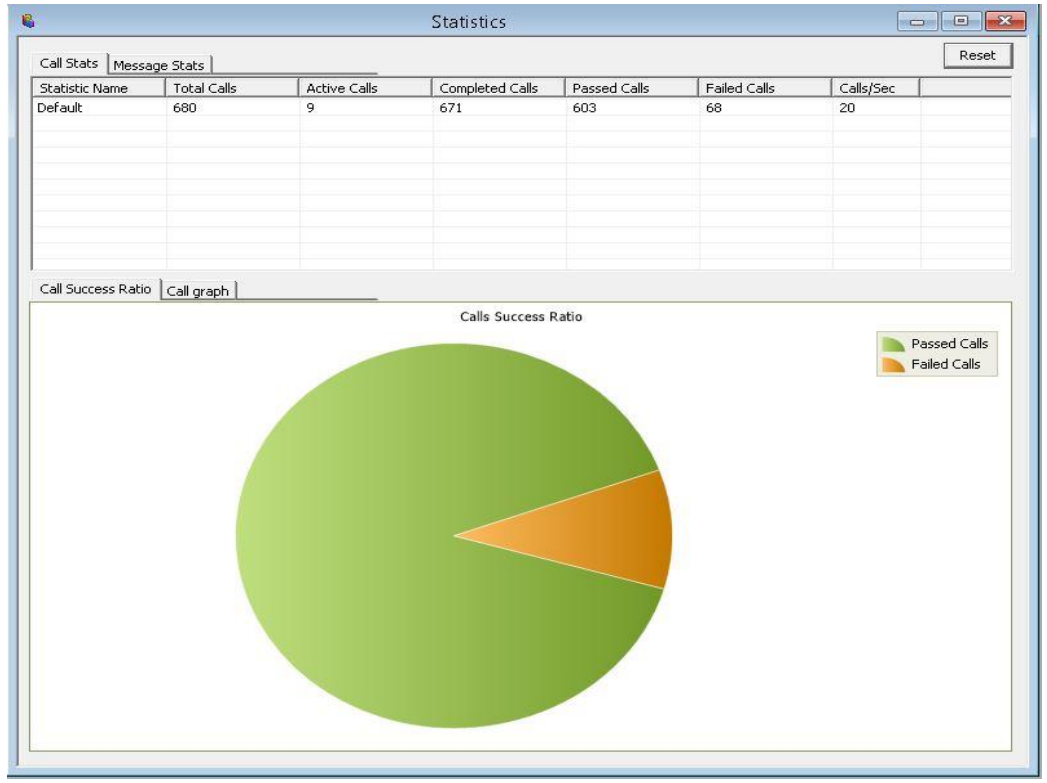
GSM A Call Ratio Statistics

Call Graph



Call Stats



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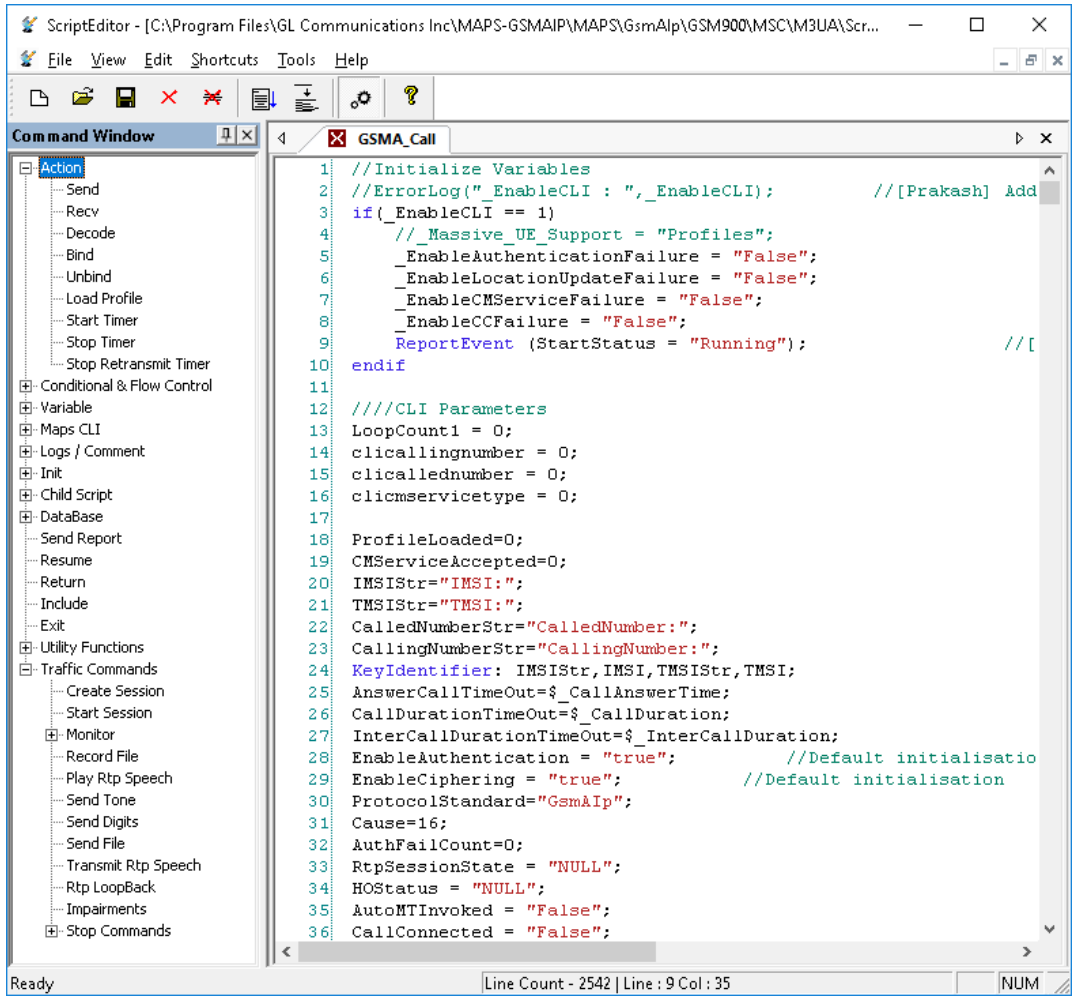
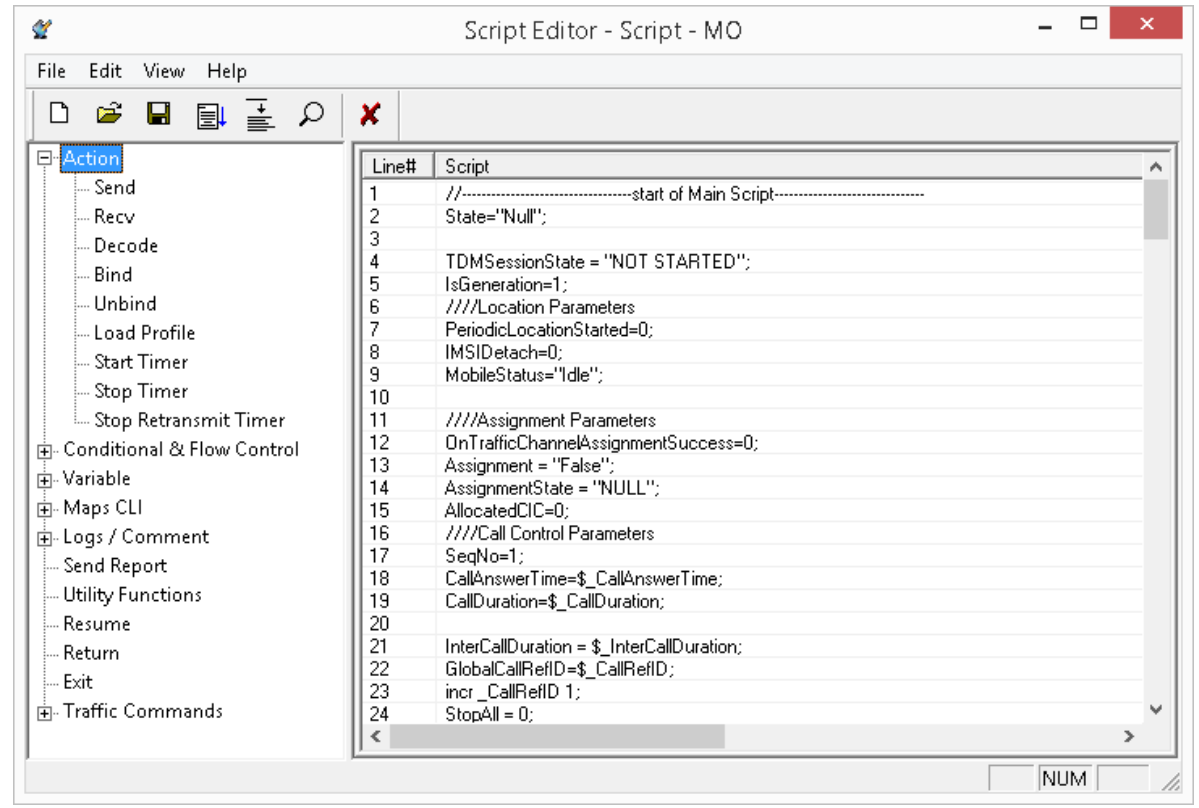
Script Editor





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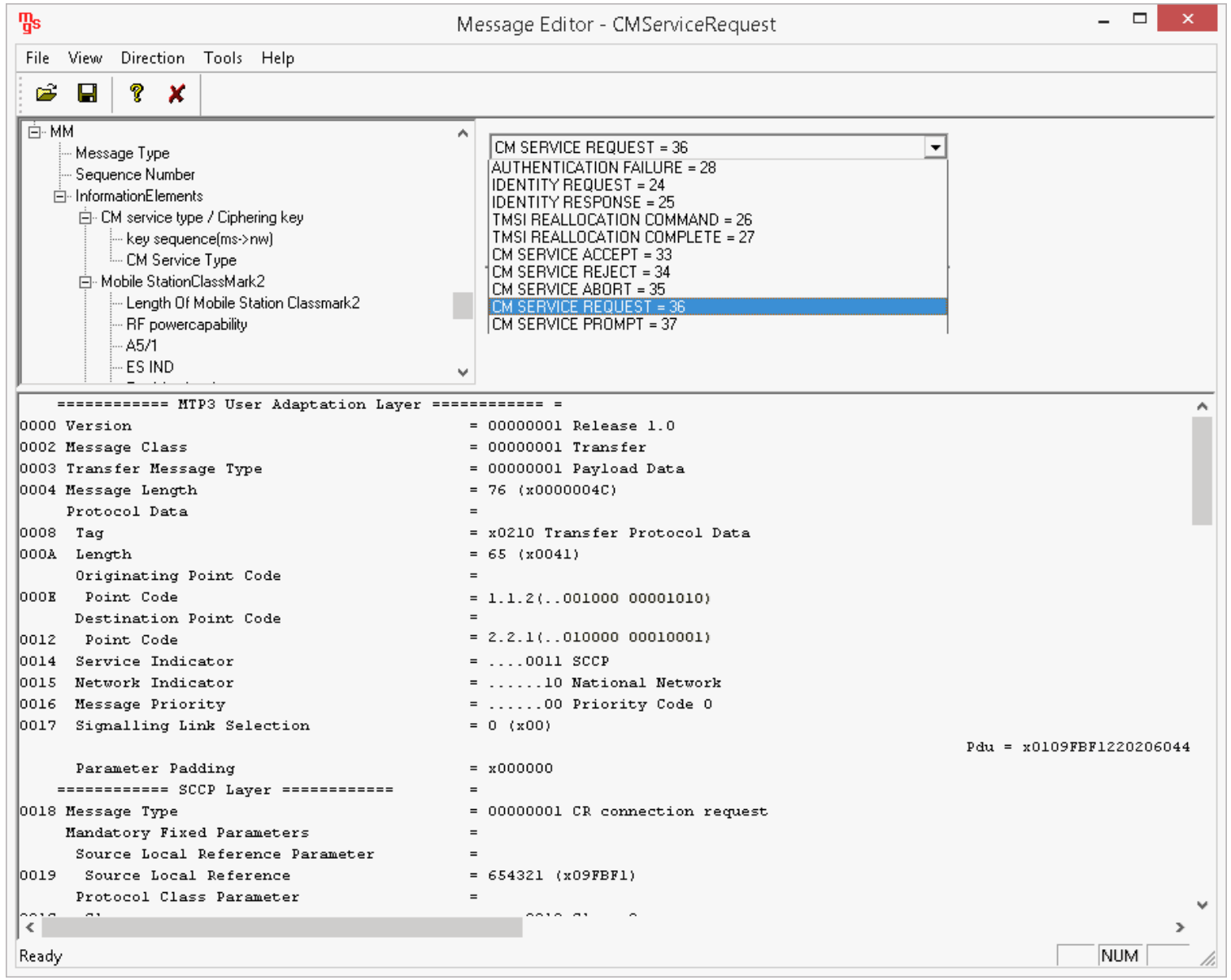
Message Editor



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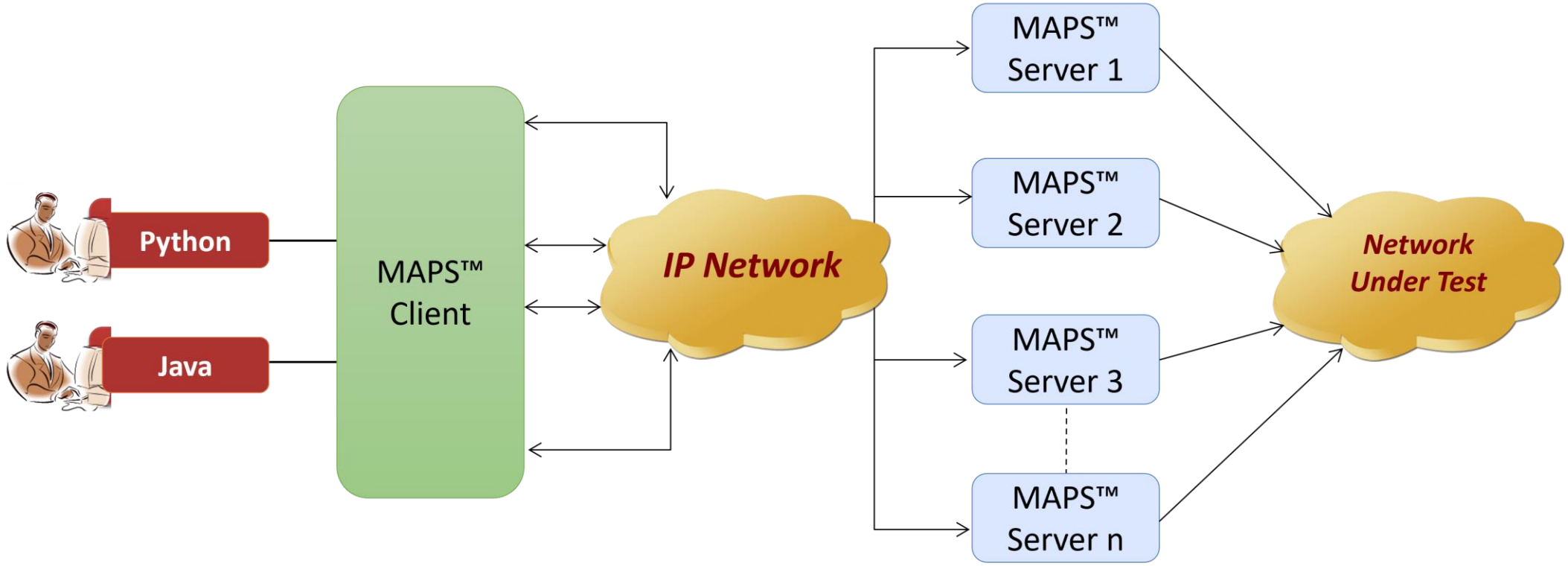
MAPS™ API Architecture



- 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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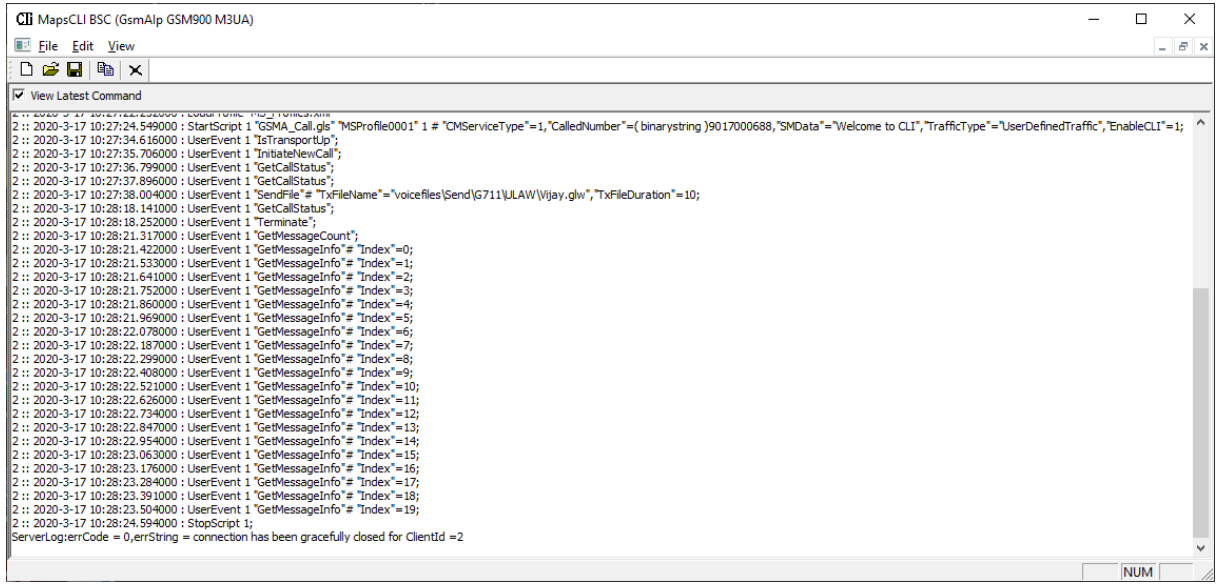
CLI/API Support



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High Density (HD) RTP Traffic Emulation

- MAPS™ GSMA 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
- Rackmount network appliance with 4x1GigE NIC
- Transport over UDP and TCP, IPv4 and IPv6, and TLS for secure transport
- Up to 250 calls per second (with RTP traffic)
- Scales to around 100,000 to 200,000 endpoints with use of Master Controller for single point of control
- Manage 10+ MAPS™ systems with single point of control from Master Controller

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Thank You

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