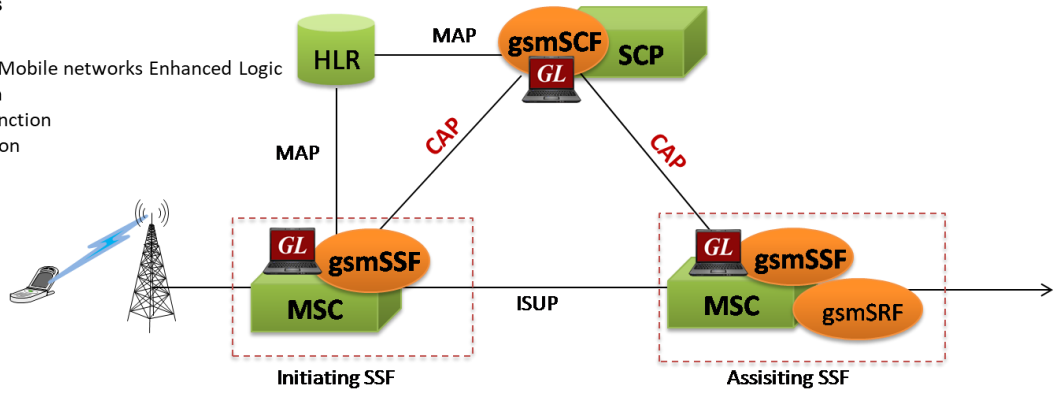
MAPS™ CAP Emulator (over TDM,ATM, IP)

(CAMEL Application Part)

MAPS™ CAP Emulator (over TDM(ATM)/IP) in GSM, GPRS, UMTS Networks

CAP -> CAMEL Application Part
CAMEL -> Customized Applications for Mobile networks Enhanced Logic
gsmSCF -> GSM Service Control Function
gsmSRF -> GSM Specialized Resource Function
gsmSSF -> GSM Service Switching Function



Overview

GL's MAPS™ CAP can emulate CAMEL Application Part (CAP) supplementary services such as unified messaging, prepaid, low balance, and toll-free (Freephone). CAMEL services are available in TDM, ATM and IP based GSM, GPRS, UTMS networks. CAP information flow is defined between functional entities such as Service Control Function (SCF) and Service Switching Function (SSF) entities. It is suitable for controlling telecommunication services. CAP is transported over Message Transfer Protocol (MTP) in TDM ATM and M3UA, M2PA in IP.

MAPS™ CAP ATM uses SSCOP server for establishing SSCOP links over which IN signaling will be carried further for making calls. SSCOP Server is GL's WCS based server module and provides SSCOP, and AAL5 layer services.It uses AAL5 Traffic Generator for traffic generation. Various traffic types such as Tone, Digits and File playback are supported.

The tester supports testing network elements SSF and SCF, error tracking, regression testing, conformance testing, and load testing/call generation. It can run pre-defined test scenarios against CAP interface test objects in a controlled and deterministic manner.

MAPS™ CAP emulator supports powerful utilities such as Message Editor, Script Editor, and Profile Editor which allow new scenarios to be created or existing scenarios to be modified using CAP messages and parameters.

For more information, refer to MAPS™ CAP Protocol Emulator webpage.

Main Features

- CAP protocol simulation over TDM, ATM (T1/E1) and over IP based GSM, GPRS, UMTS networks
- Supports 3GPP variant of CAP protocol over GSM, ATM, GPRS, UMTS
- CAP messages are conveyed as the component part of TCAP messages
- Supported Procedures:
  - Apply Charging for GSM call sessions
  - Apply Charging GPRS sessions for Data transfer
  - Connect to Resource
  - Establish Temporary Connection
  - Check Balance
  - CAMEL SMS, Toll free and Initiate Call Attempt (ICA) Service
- Scripted call generation and call reception
- Access to all MTP3, M3UA, M2PA, SCTP, SCCP, and CAP protocol fields such as Routing Number, Called Party Number and more
- User controlled access to optional parameters such as timers
- Test Service Usage Charging for Voice, Data, SMS, etc
- Cost-of-call verification through balance check
- Test Premium Calling and Toll-Free Services

GL Communications Inc.

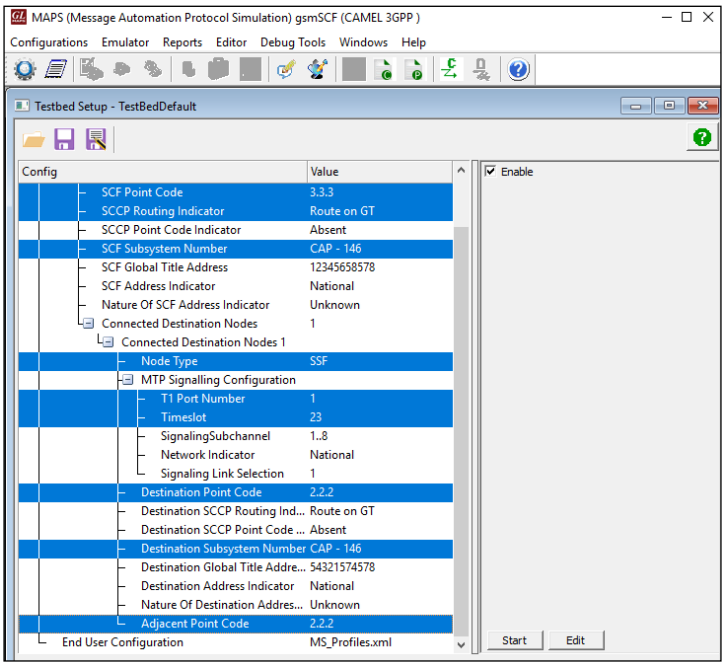
818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A

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

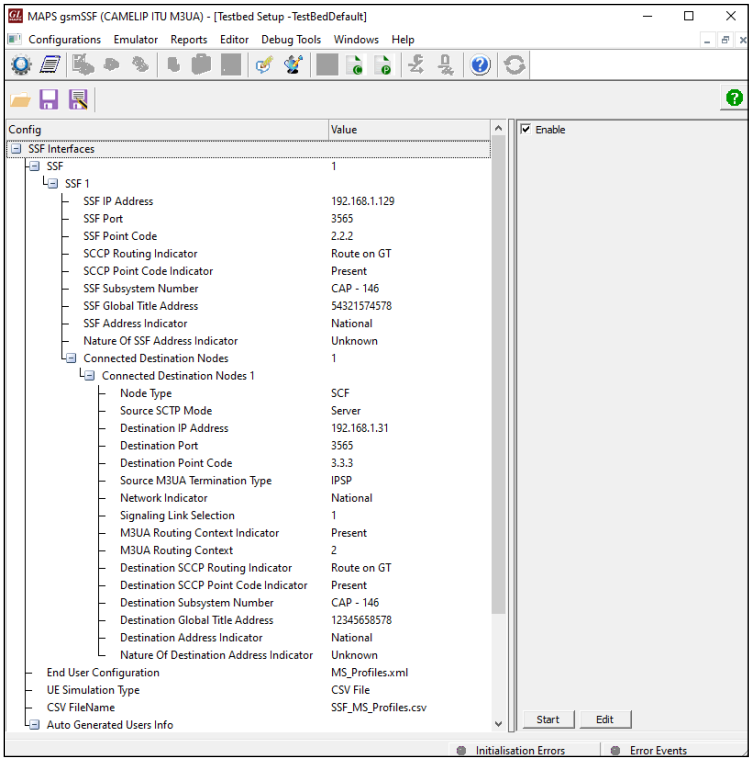
Test Bed Setup Configuration

Test Bed Setup provides options to establish communication between MAPS™ CAP and the DUT. MAPS™ CAMEL TDM/ATM includes MTP signaling configuration, Source and Destination Node Point Code, Subsystem Number, and End-user configurations. MAPS™ CAMEL IP includes SCTP layer parameters configuration to transmit and receive CAP messages over M3UA and M2PA transport layers.

Once the testbed setup is configured properly, CAMEL messages can be transmitted and received over MTP, M3UA, M2PA layers. Default profile is used to configure MAPS™ CAP Emulator as end terminals SCF and/or SSF.



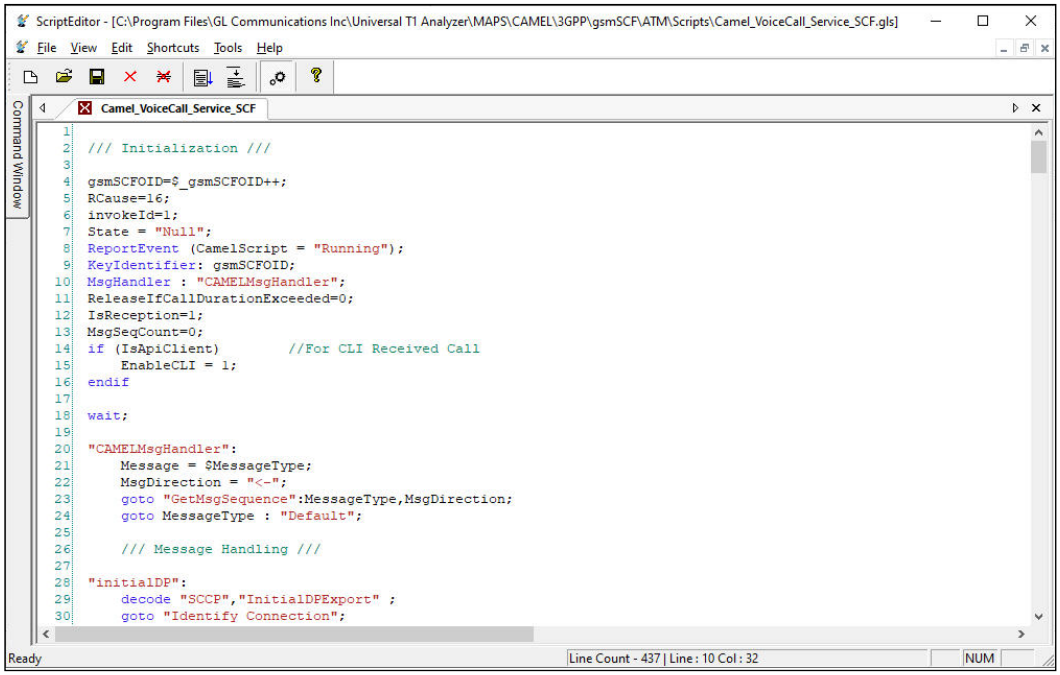
Testbed Setup over T1 E1



Testbed Setup over IP

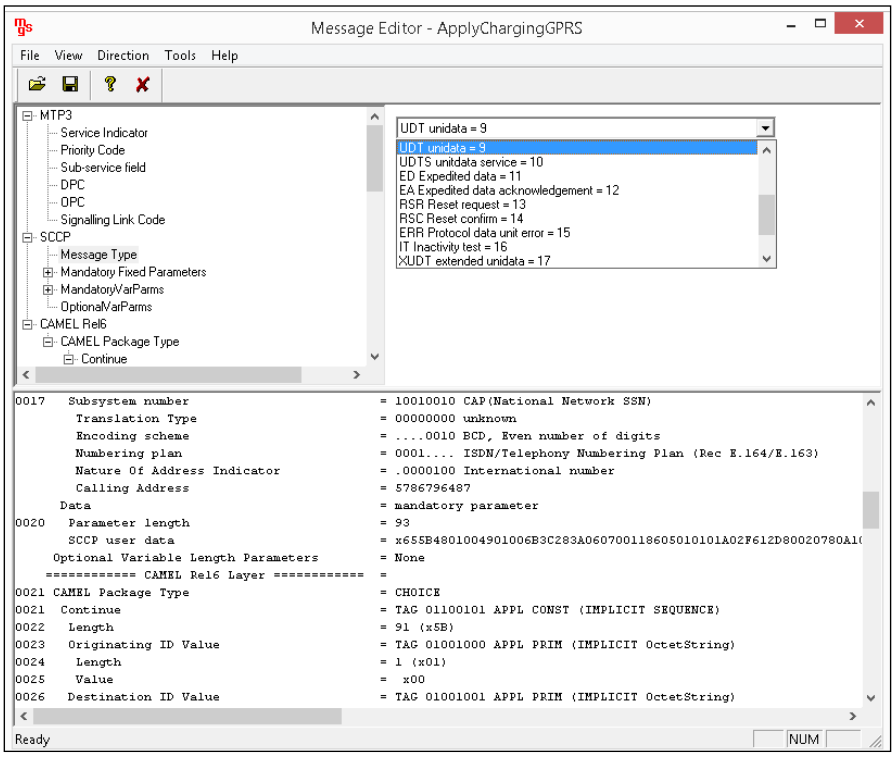
Pre-processing Tools

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.



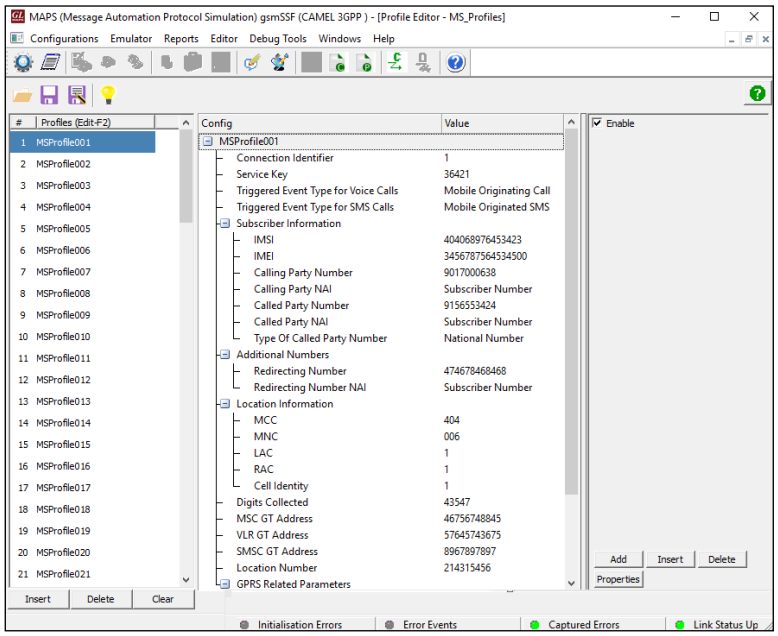
Script Editor

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.



Message Editor

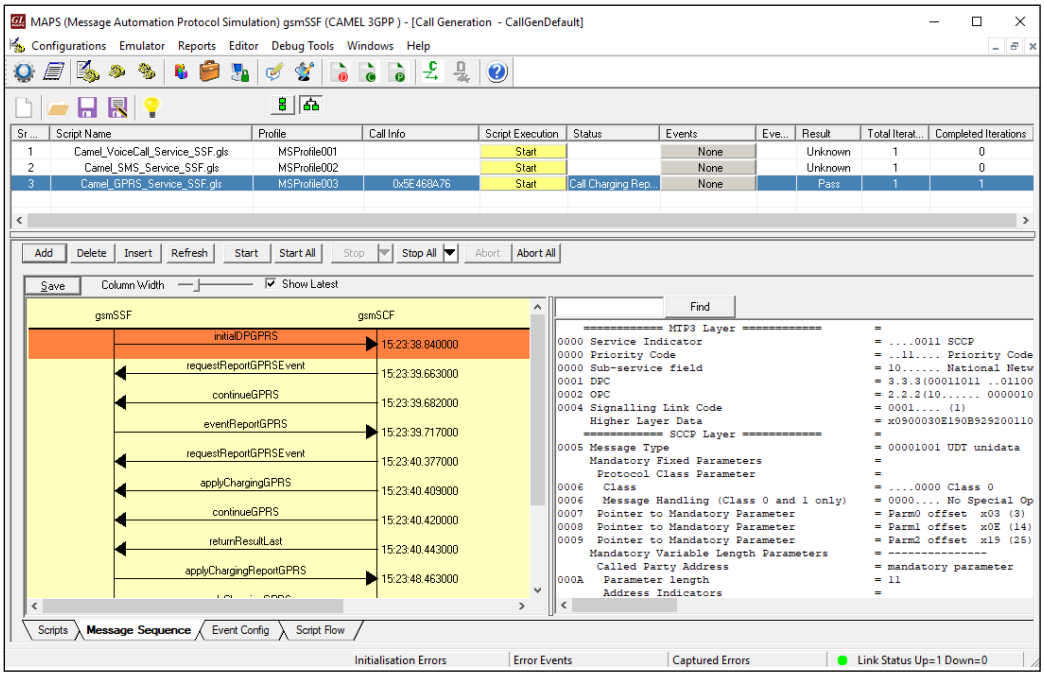
PROFILE EDITOR - The profile editor feature allows loading profile to edit the values of the variables using GUI, replacing the original value of the variables in the message template. An XML file defines a set of multiple profiles with varying parameter values that allow users to configure call instances in call generation and to receive calls.



Profile Editor

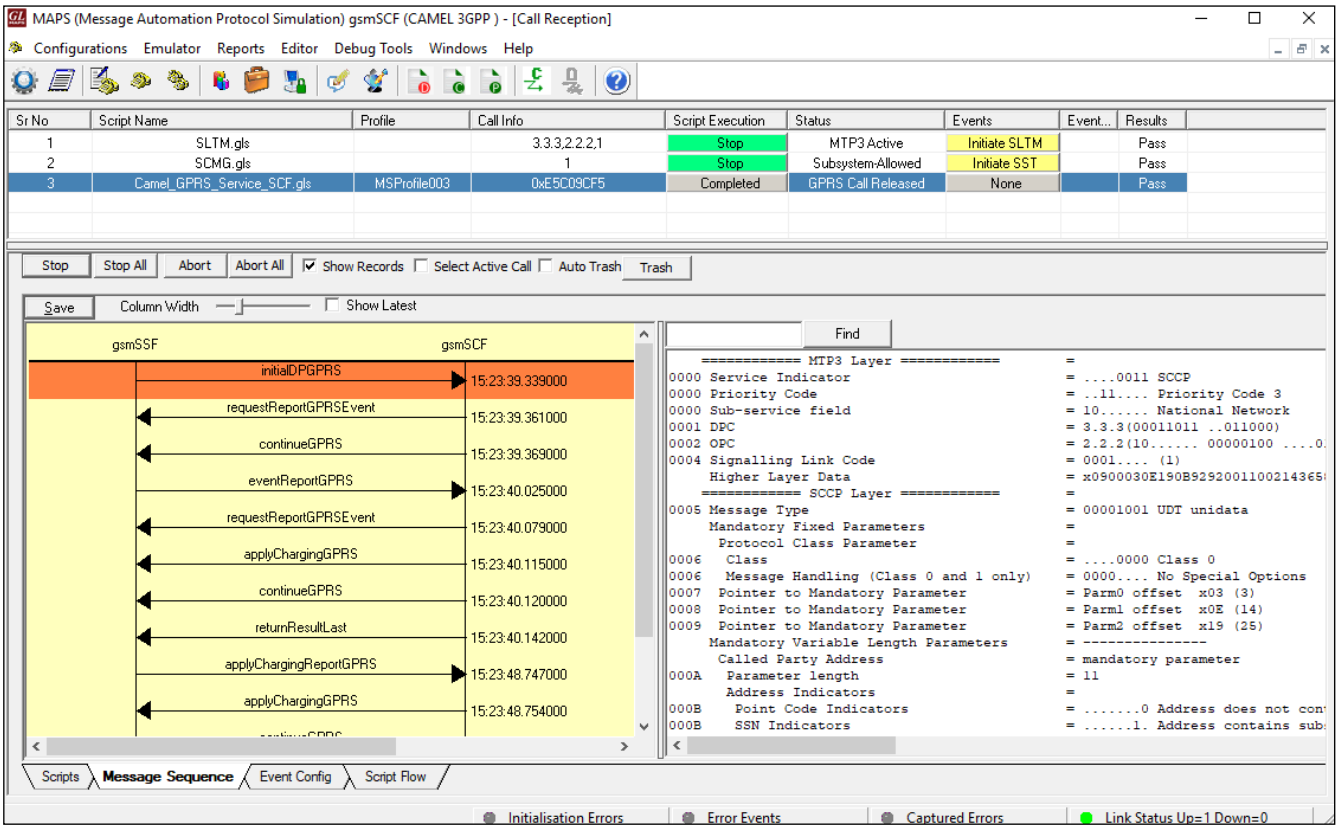
Call Generation and Call Reception

In call generation, MAPS™ CAP 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.

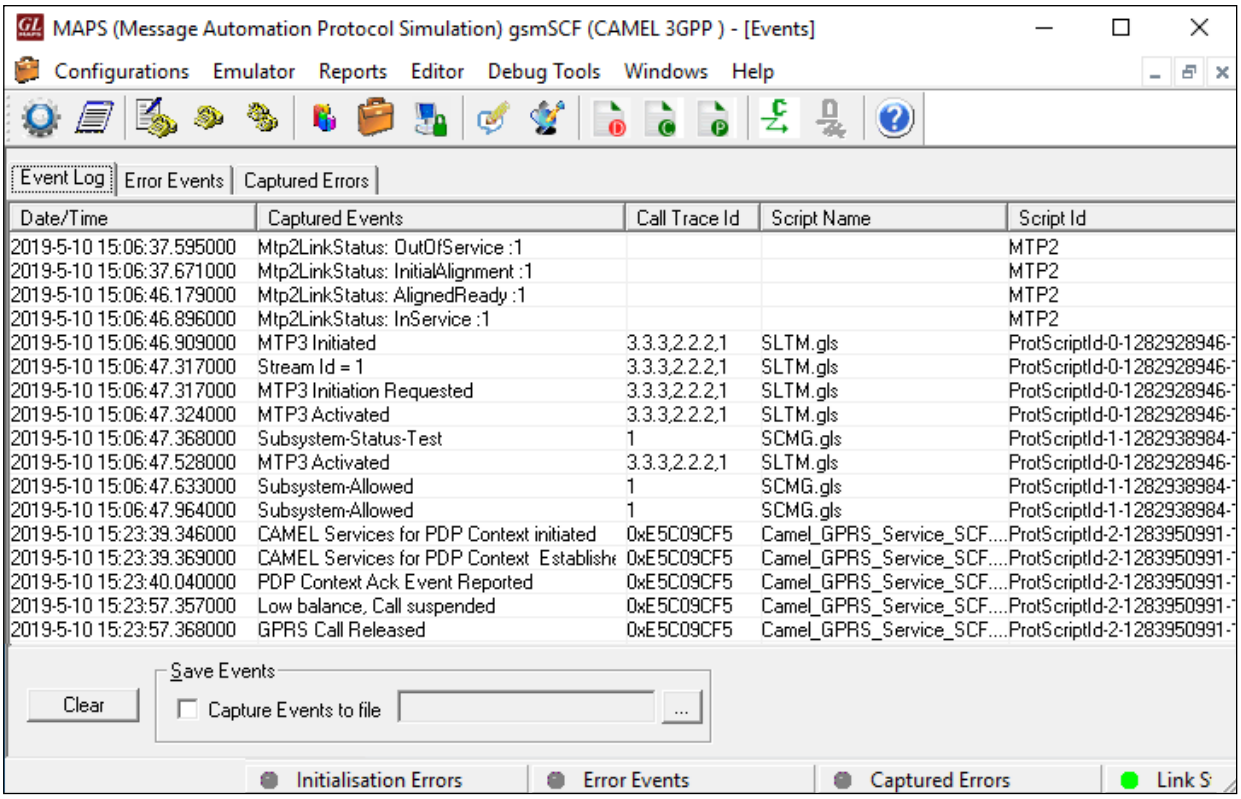


Call Generation

Call Generation and Call Reception (Contd.)



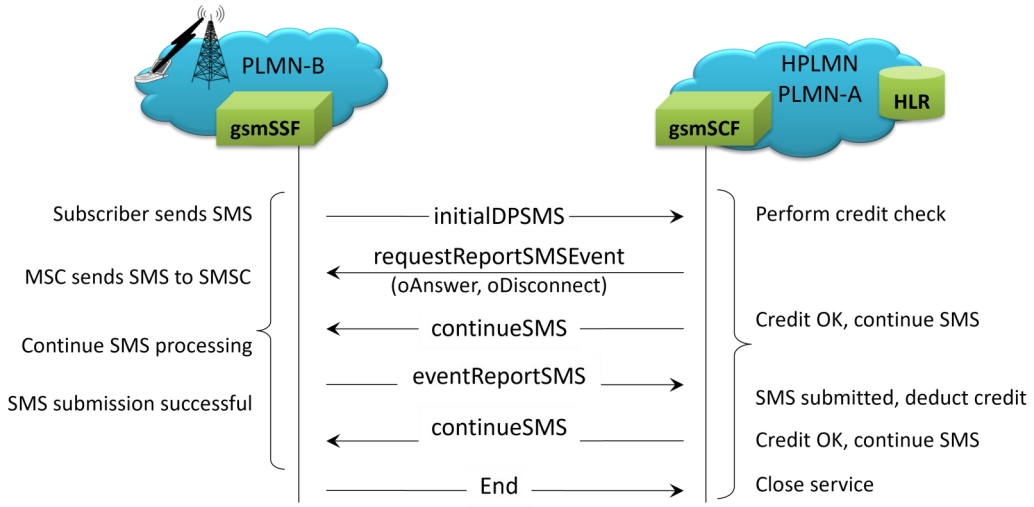
Call Reception



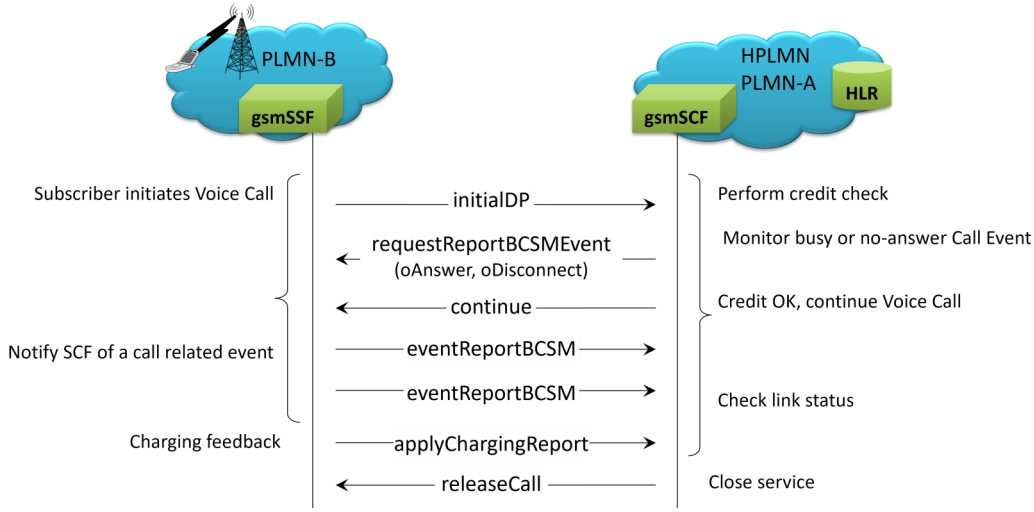
Events Log

CAMEL Procedures (over IP and TDM)

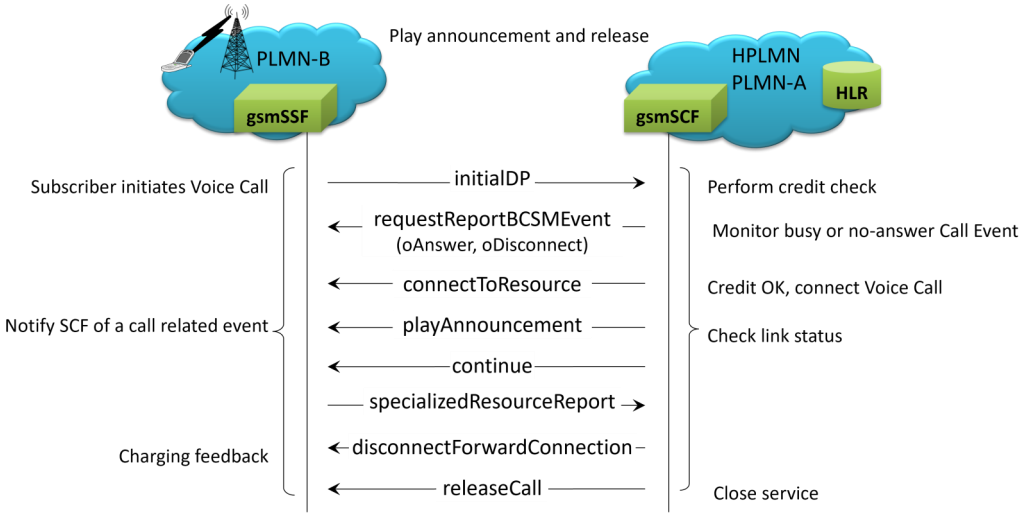
MAPS™ CAP emulator can be configured to emulate procedures over IP and TDM. Supported services includes Prepaid Voice Call, Apply Charging GPRS, Low balance Voice Call, Toll-free Call, Initiate Call Attempt (ICA), and Camel SMS.



CAMEL SMS Procedure

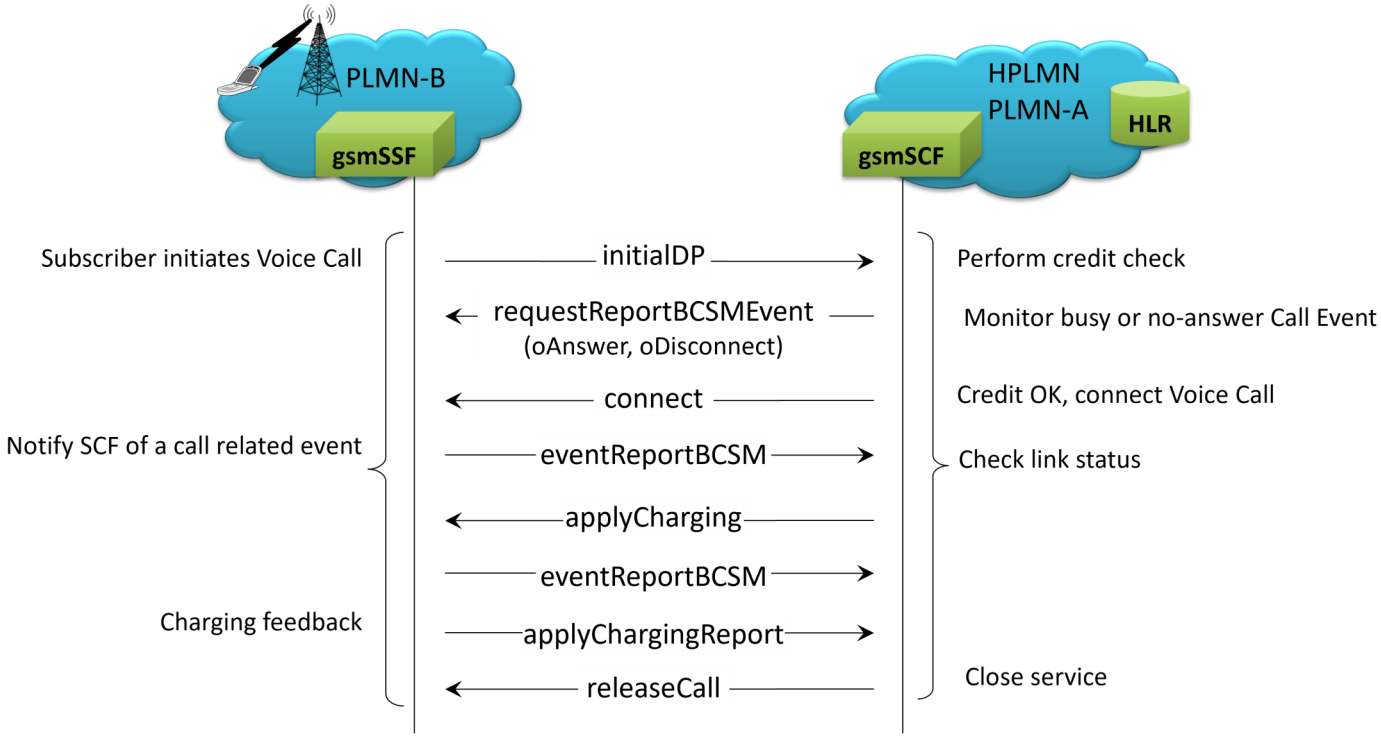


Prepaid Voice Call Service

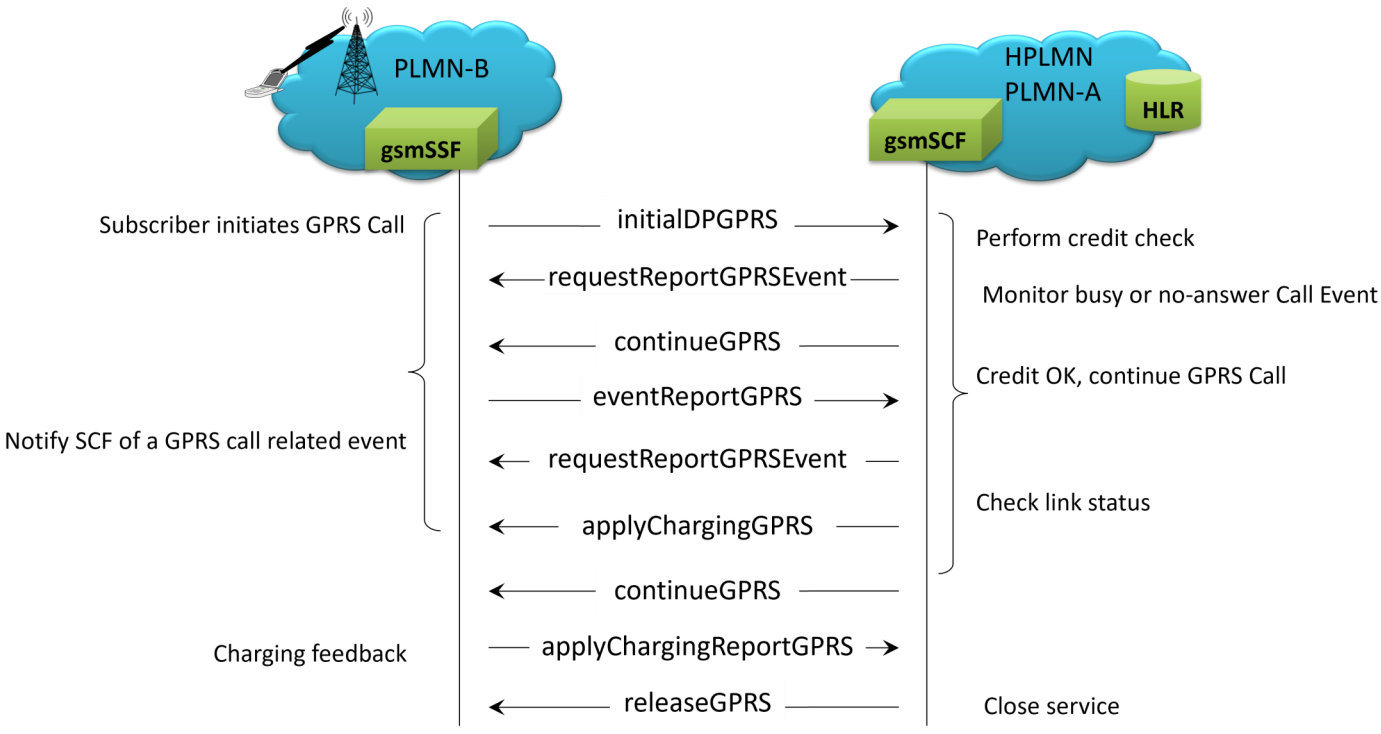


Low Balance Voice Call Service

CAMEL Procedures (over IP and TDM Contd.)



Toll Free Voice Call Service

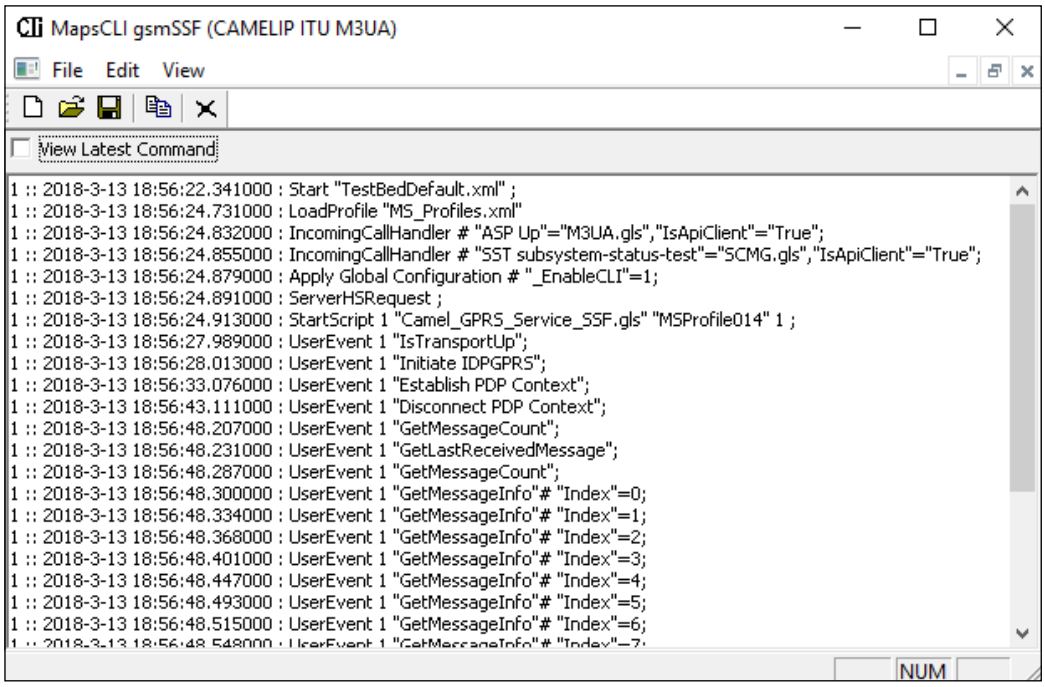


Camel GPRS Service

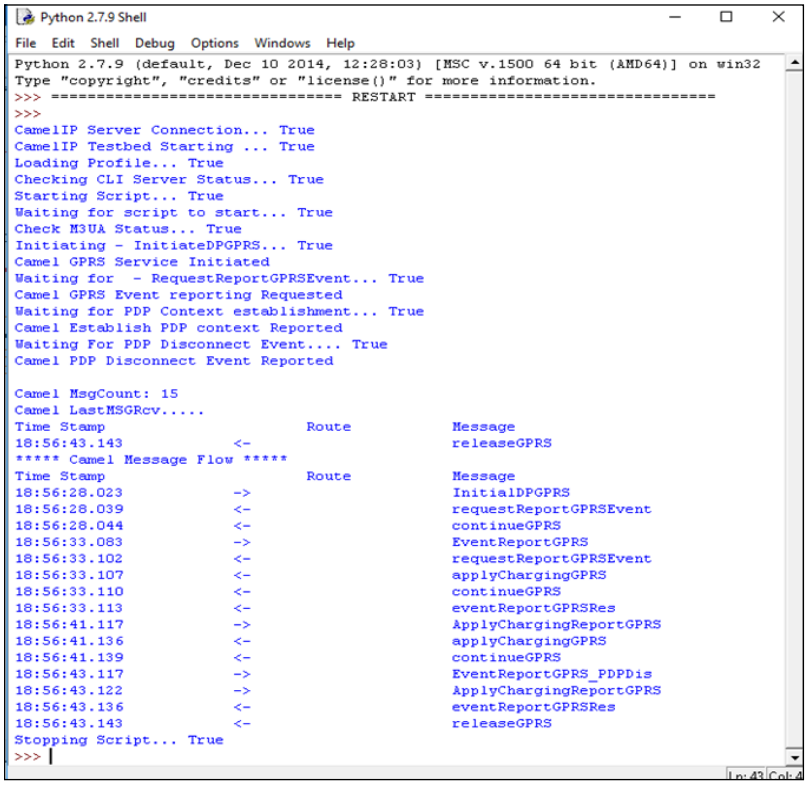
Command Line Interface

MAPS™ can be configured as server-side application, to enable remote controlling of the application through multiple command-line based clients. Supported clients includes Python and Java.

Clients can remotely perform all call control functions various traffic using commands. This client application is distributed along with MAPS™ Server application.

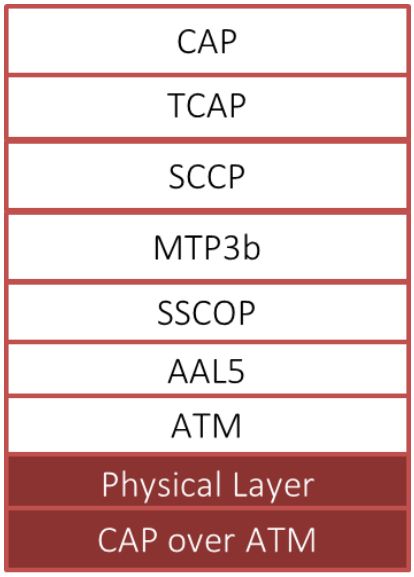


MAPS™ CLI Server

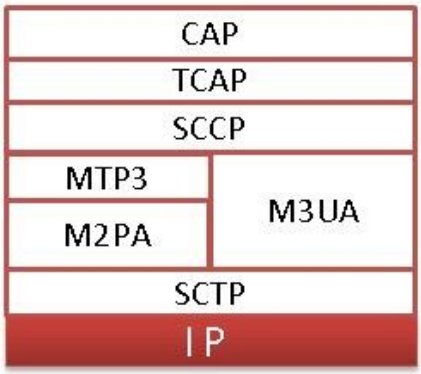


Sample Python Client

Supported Protocols and Specifications



Supported Protocols	Standard / Specification Used
TDM	
CAP	3GPP TS 29.002 V4.18.0 (2007-09)
TCAP	ANSI T1.114-1996
SCCP	Q.713, CCITT (ITU-T) Blue Book
MTP3	Q.703, ITU-T Blue Book
ATM	
CAP	3GPP TS 29.002 V4.18.0 (2007-09)
TCAP	ANSI T1.114-1996
SCCP	Q.713, CCITT (ITU-T) Blue Book
MTP3b	ITU-T Q.2210
SSCOP	ITU-T Q.2110
AAL5	Class C & D (ITU-T I.363.5)
ATM	ITU-T I.361



Supported Protocols	Standard / Specification Used
CAP	3GPP TS 29.078 6.3.0 (2004-09)
TCAP	ANSI T1.114-1996
SCCP	Q.713, CCITT (ITU-T) Blue Book
M2PA	RFC 4165
M3UA	RFC 3332
SCTP	RFC 4960

Buyer's Guide

Item No	Product Description
XX696	MAPS™ CAP Emulation (CAMEL Application Part)
PKS151	MAPS™ CAP IP Emulation (CAMEL Application Part)

Item No	Related Software
XX694	MAPS™ MAP Emulation (B, C, D, E, F, G, and H interfaces)
PKS132	MAPS™ MAP IP Emulator

Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer (Require Basic Software)
FTE001	QuadXpress T1 E1 Main Board (Quad Port)
ETE001	OctalXpress T1 E1 Daughter boards (Octal Port)
XTE001	Dual Express (PCIe) T1 E1 Boards
TTE001	tScan16™ T1 E1 Boards

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

For more information, refer to MAPS™ CAP Protocol Emulator webpage.

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