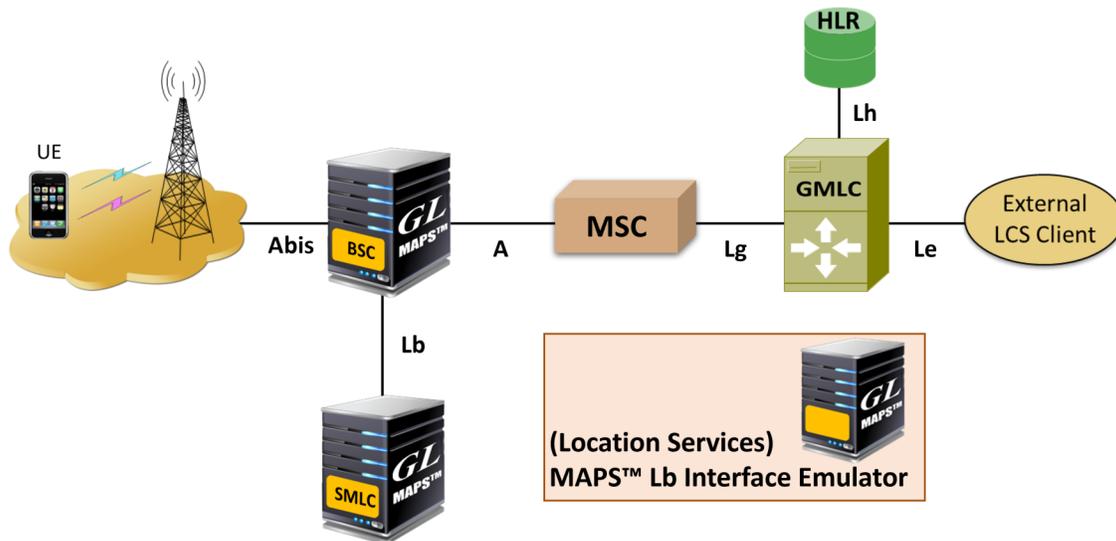


MAPS™ Lb Interface Emulator

(Base Station System Application Part LCS Extension (BSSAP-LE))



Overview

Accurate location services find its use in many public operations such as emergency services, vehicle tracking, stolen assets tracking, advertising, and social networking. Location Service is used to estimate the geographic location of a Mobile Station (MS) and/or valid Mobile Equipment (ME), expressed in latitude and longitude, represented in a well-defined universal format. Location Services (LCS) architecture follows a client/server model with a positioning node acting as the server providing information to external LSC clients.

An extension of the Base Station System Application Part (BSSAP) supports [location services](#) over SCTP in Geran. The Lb interface procedures are initiated by BSS and is used to obtain the location estimate for a target MS. The procedure makes use of SCCP connection oriented signaling on the GSM Lb interface.

GL's Message Automation and Protocol Simulation (MAPS™) communication protocols test tool platform is enhanced to support emulation of location services on GSM Lb interface. MAPS™ Lb interface emulator, emulates network elements such as the SMLC Serving Mobile Location Center (SMLC) and Base Station Center (BSC), as defined in 3GPP TS 49.031 specifications.

For more information, visit [MAPS™ Lb Interface Emulator](#) webpage.

Main Features

- Useful tool to perform Location services testing over BSC <-> SMLC Lb interface
- Emulator can be configured as BSC, SMLC nodes and study the call flow and exchange of signaling messages between any of these nodes
- User-friendly GUI for BSSAP LCS Extension (BSSAP-LE) message exchange over M3UA/SCTP and SCCP
- Ready scripts for BSSAP-LE procedures
- The following are the supported procedures.
 - Connection Oriented Location Service Request
 - Connection Oriented Location Information Transfer
 - TA (Timing Advance) Positioning
- Provides protocol trace with full message decoding of the BSSAP messages
- Supports customization of placing and answering calls using Profile editor and Message editor
- Provides Call Statistics and Events Status
- Automation, Remote access, and Schedulers to run tests 24/7



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Testbed Configuration

The testbed setup window allows users to setup the required test environment with SCTP configuration for Lb interface.

SCTP Configuration parameters consists of source / destination IP address, port configurations to emulate BSC and SMLC entities in Lb interface. MAPS™ can then generate and receive BSSAP messages to/from valid IP Address in the GSM network. End user configuration profile used to configure MAPS™ Lb with supported SMLC and BSC parameters.

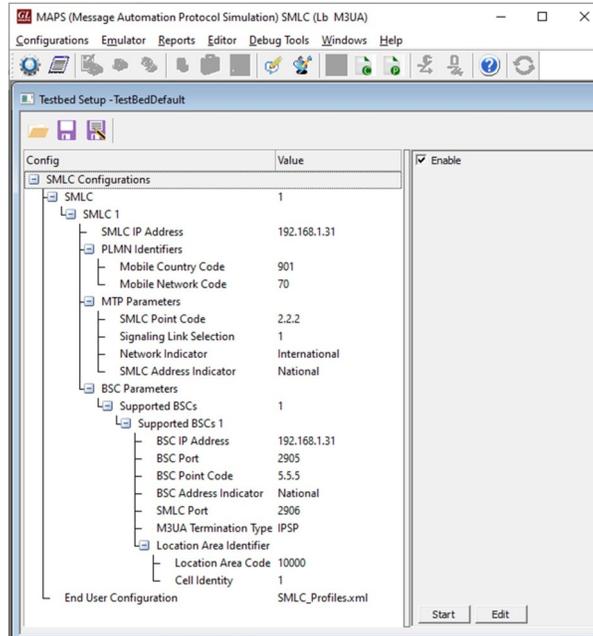


Figure: Testbed Setup

Pre-processing Tools

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.

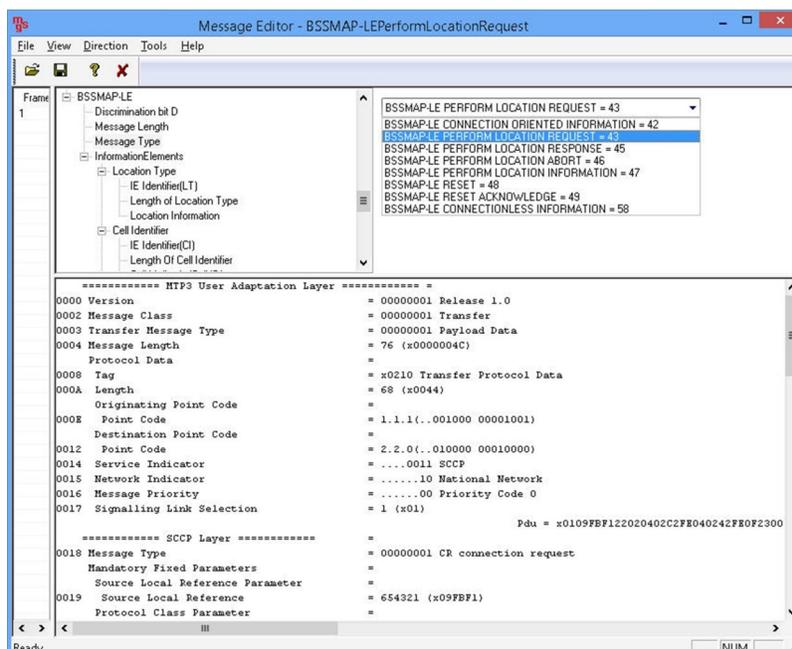


Figure: Message Editor

Pre-processing Tools (Contd.)

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.

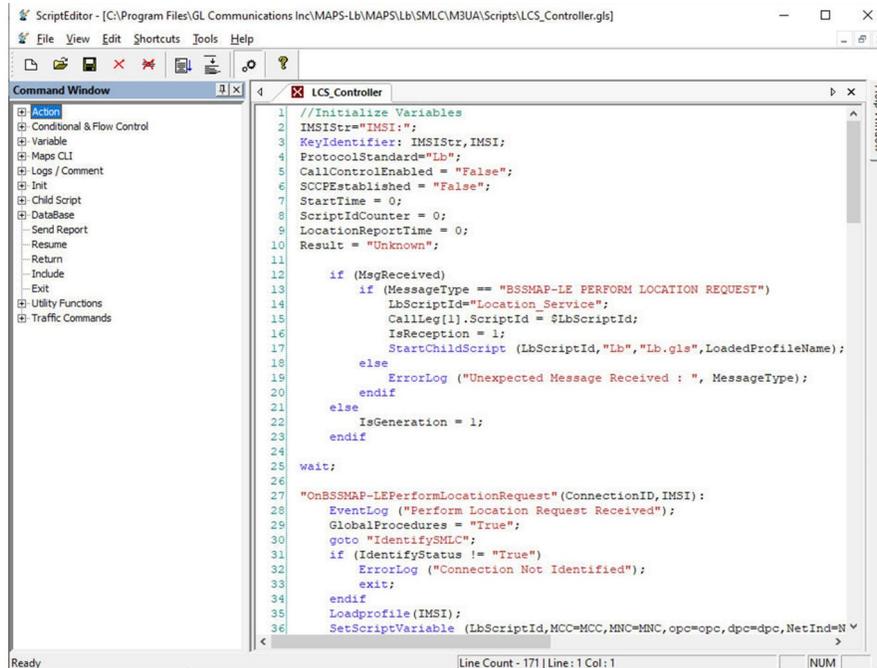


Figure: Script Editor

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.

Includes Location services transactions parameters such as originating LCS Client type, LCS QOS, Location Estimate, Location Type, Positioning Method, and other related configurations required for BSSAP emulation.

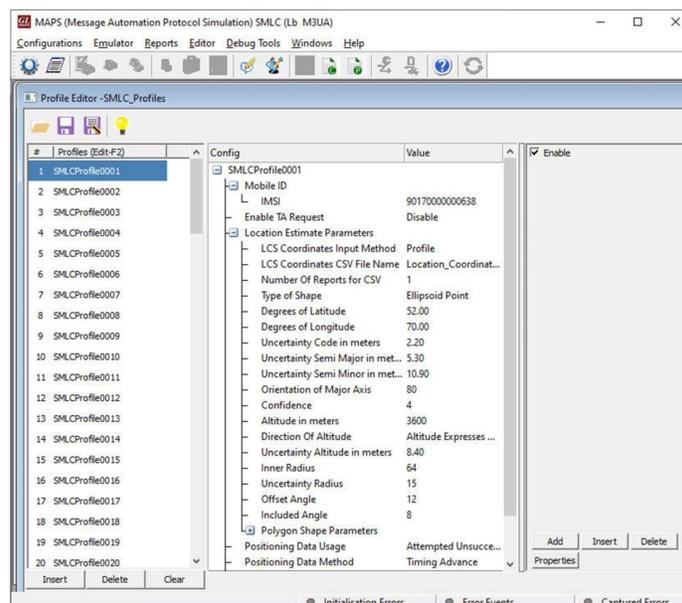


Figure: Profile Editor

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 are started manually at call generation; and at the call reception, the script is automatically triggered by incoming messages.

The screen below is the MAPS™ Lb Emulator configured as BSC initiating Location Estimate Request procedure towards SMLC.

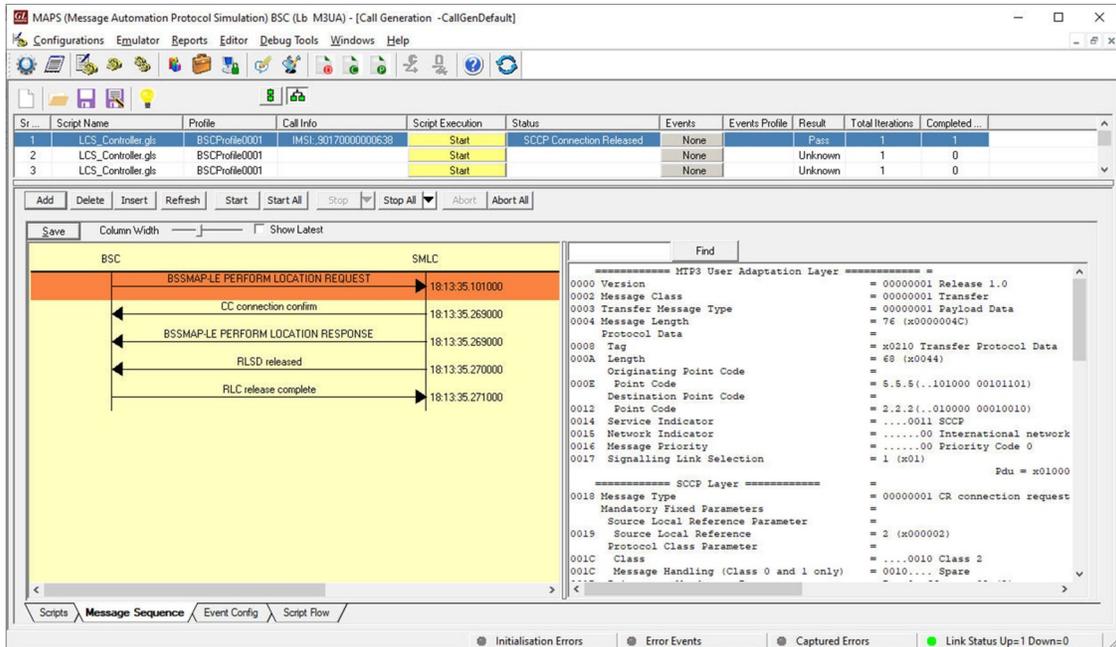


Figure: BSSAP Location Request Emulation at BSC

MAPS™ Lb Emulator configured as SMLC receives and processes the Location Request User procedure.

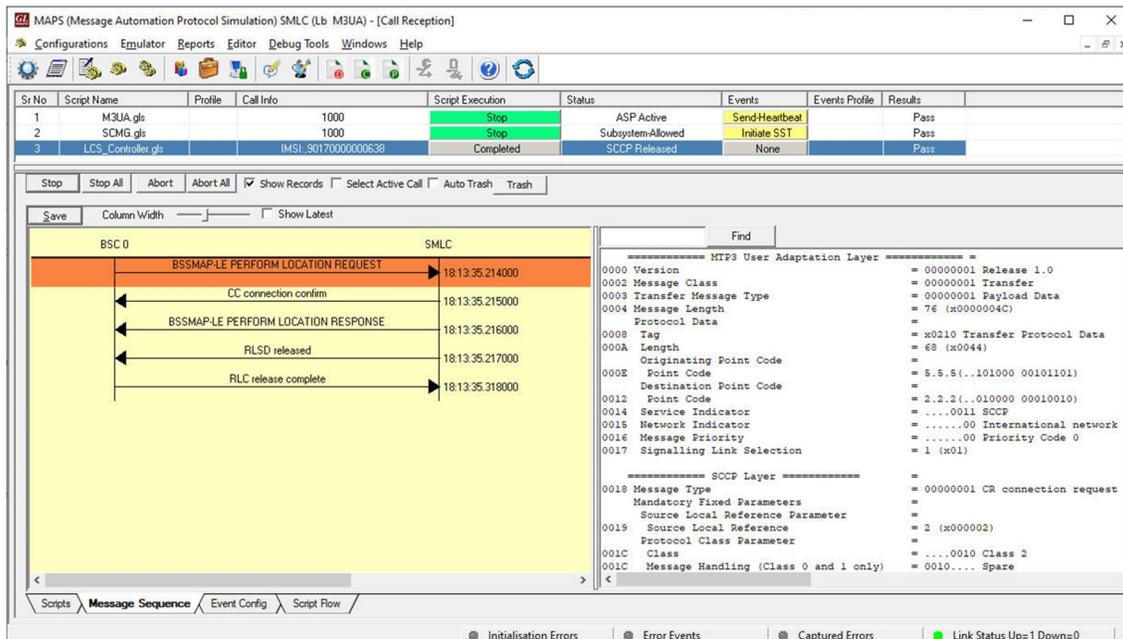


Figure: BSSAP Location Request Emulation at SMLC

Typical GSM Lb Interface Procedures

The GSM Lb interface procedures can be divided as follows:

- Location request procedure
- Location information exchange procedure
- TA Positioning procedure

TA (Timing Advance) Positioning Procedure

TA (Timing Advance) positioning procedure is generic for a standalone SMLC or integrate SMLC in the BSC.

The SMLC sends a BSSMAP-LE Connection Oriented Information message to the BSC serving a particular target MS. BSC returns the current TA value and current serving cell for the target MS to the SMLC in a BSSMAP TA response. TA response may also include the latest measurement results received from the target MS for the serving and neighboring cells.

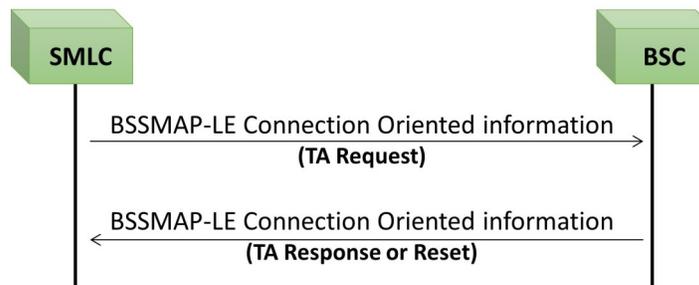


Figure: TA Positioning Procedure

Location Request Procedure

The Location Request procedure is applicable to the Lb interface. Its purpose is to obtain a location estimate for a target MS. The initiator of a location request is the BSC. The procedure makes use of SCCP connection oriented signaling on the Lb interface.

Transfer of BSSMAP-LE messages using SCCP connection to support positioning of a particular target MS is as shown in the figure below.

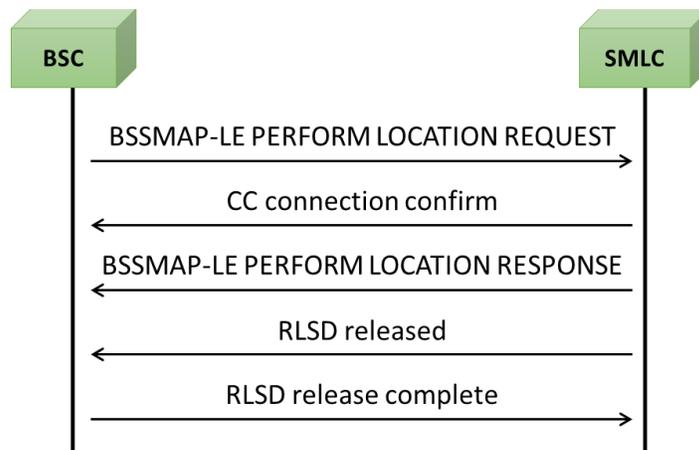


Figure: BSSMAP-LE Location Request Procedure

Supported Protocols and Specifications

BSSLAP	LLP	SMLCPP
BSSAP-LE (BSSMAP-LE and DTAP-LE)		
SCCP		
M3UA		
SCTP		
IP		
MAC		
Physical Layer		

Supported Protocols	Standard / Specification Used
BSSLAP	3GPP TS 48.071
BSSMAP-LE	3GPP TS 49.031
SCCP	Q.713, CCITT (ITU-T) Blue Book
SCTP	RFC 4960

Buyer's Guide

Item No	Product Description
PKS147	MAPS™ Lb Interface Emulator

Item No	Related Software
PKS146	MAPS™ LTE SGs Interface Emulator
PKS139	MAPS™ Diameter Emulator
PKS148	MAPS™ LTE SLs Interface Emulator
PKS140	MAPS™ LTE S1 Interface
PKS142	MAPS™ LTE eGTP (S3, S4, S5, S8, S10, S11 and S16) Interfaces
ETH100	Mobile Traffic - PacketCheck™
ETH101	MobileTrafficCore - GTP
ETH102	MobileTrafficCore - Gateway

For more information, visit [Signaling and Traffic Emulator](#) webpage.



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