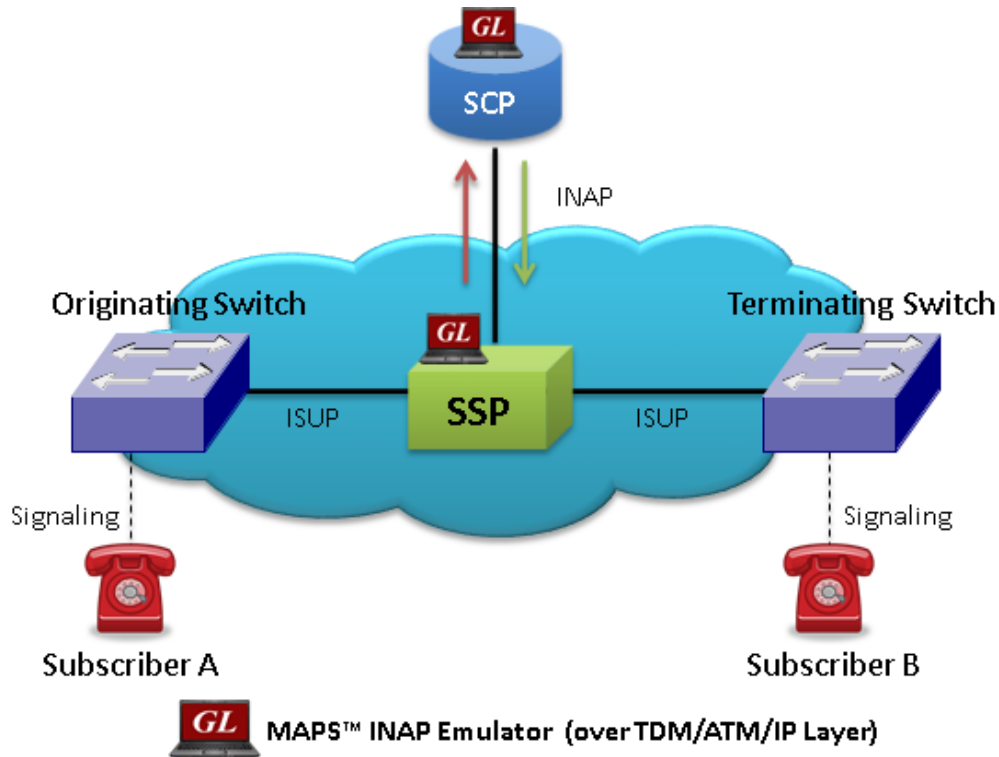# MAPS™ INAP Emulator
(INAP Emulation over IP, TDM and ATM)

MAPS™ INAP Emulator (over TDM/ATM/IP Layer)

Overview

GL's **Message Automation & Protocol Simulation (MAPS™)** is an advanced protocol simulator/tester for **INAP (Intelligent Network Application Part)** services. The tester supports testing network elements gsmSCF and gsmSSF, error tracking, regression testing, conformance testing, load testing/call generation. It is able to run pre-defined test scenarios against INAP test objects in a controlled & deterministic manner.

MAPS™ INAP scripts are suitable for testing objects reliably and accurately validated for compliance with ANSI and ITU-T specifications. It is suitable for controlling telecommunication services such as CNAM (Calling Name Delivery), LNP (Local Number Portability), and Toll-free 800 Number as per ANSI specifications. Services such as Prepaid Voice Call, Low Balance Voice Call, Toll free Voice Call, and Initiate Call Attempts (ICA) are supported over IP, TDM and as per ITU-T specifications. INAP can be transported using Message Transfer Protocol (MTP) in TDM (T1 and E1) or by M2PA, M3UA, and M2UA in IP using SIGTRAN.

MAPS™ INAP 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 like Tone, Digits and File playback are supported.

The application gives the users the unlimited ability to edit messages to create IN service scenarios (message sequences). "Message sequences" are generated through scripts. "Messages" are created using message templates.

Also available is an independent GUI based SS7 Analyzer (for TDM) and SIGTRAN Analyzer (for IP) for online capture and decode of the signaling in real-time both during tests and as a stand-alone tracer for live systems.

For more information, refer to MAPS™ INAP Emulator webpage.

Main Features

- Supports SSF and SCF entity simulation over IP, ATM, TDM (T1/E1) based SS7 network
- Supports ITU variant of INAP protocol over GSM, GPRS, UMTS
- INAP messages are conveyed as the component part of TCAP messages
- Ready scripts for ITU (IP/TDM) and ANSI (IP/TDM) specification compliant services –
  - Prepaid Voice Call, Toll free Voice Call
  - Low balance Voice Call services - release on low balance, play announcement on low balance
  - Initial Call Attempts (ICA) services
  - 800 Number, CNAM, LNP, Call Diversion
- Access to all protocol fields - SCTP, M3UA, M2PA, M2UA, SCCP, and INAP CS2 layers
- User controlled access to optional parameters such as timers
- Inter-operability testing of networks
- Enhanced IN services include mobility and broadband services
- Test Premium Calling and Toll-Free Services

Test Bed Setup Configuration

Test Bed Setup provides options to establish communication between MAPS™ INAP and the DUT.

MAPS™ INAP TDM includes MTP signaling configuration, Source and Destination Node Point Code, Subsystem Number, and End-user configurations.

MAPS™ INAP IP includes SCTP layer parameters configuration to transmit and receive IN services messages over M3UA & M2PA transport layers.

MAPS™ INAP 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. Once the testbed setup is configured properly, INAP messages can be transmitted and received over configured layer. Default profile is used to configure MAPS™ INAP Emulator as end terminal SCF and/or SSF.
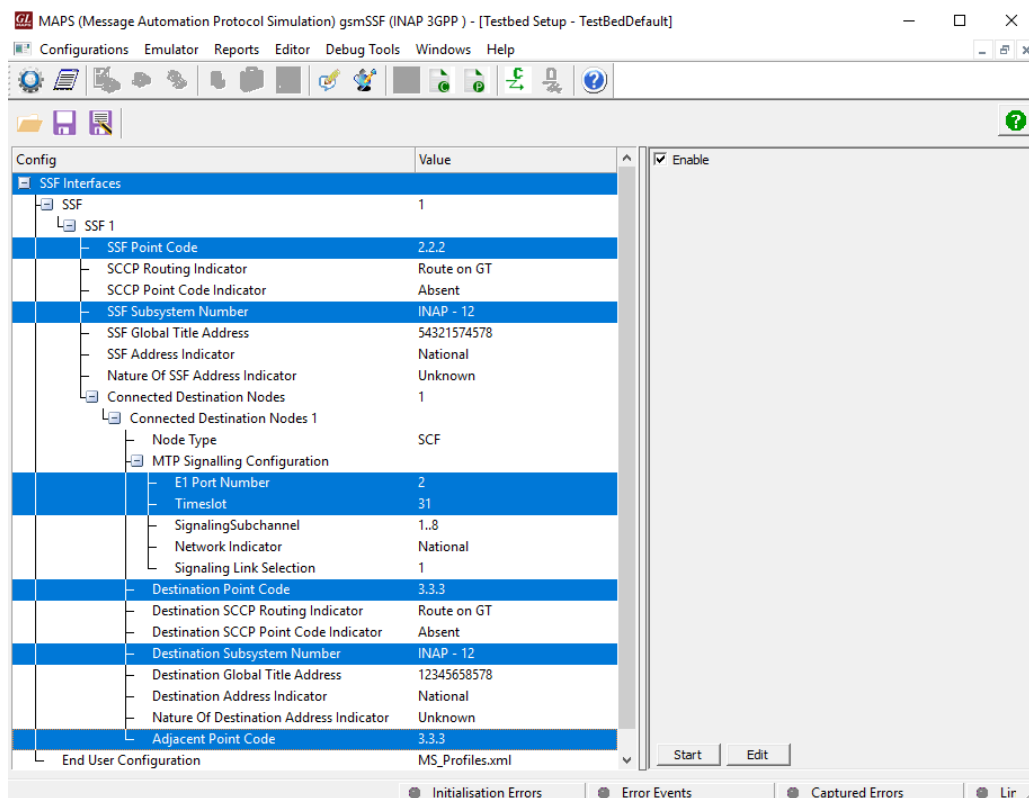

Testbed Setup Configuration over TDM

◇ GL Communications Inc.
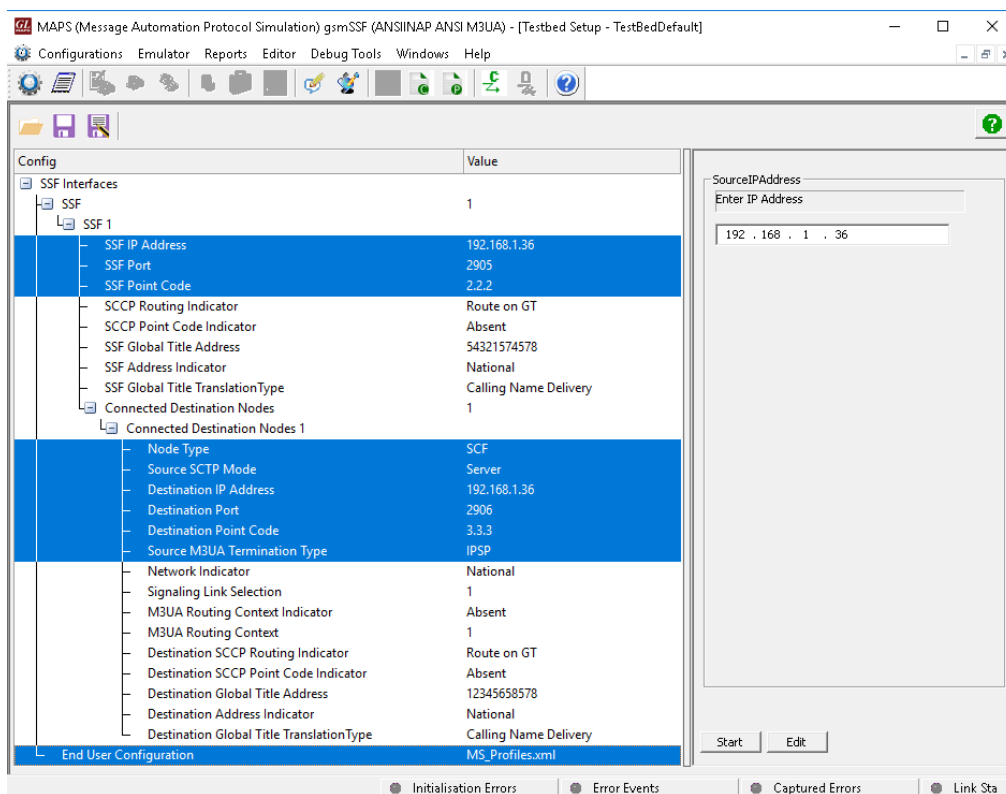
Testbed Setup Configuration over IP

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

GL Communications Inc.
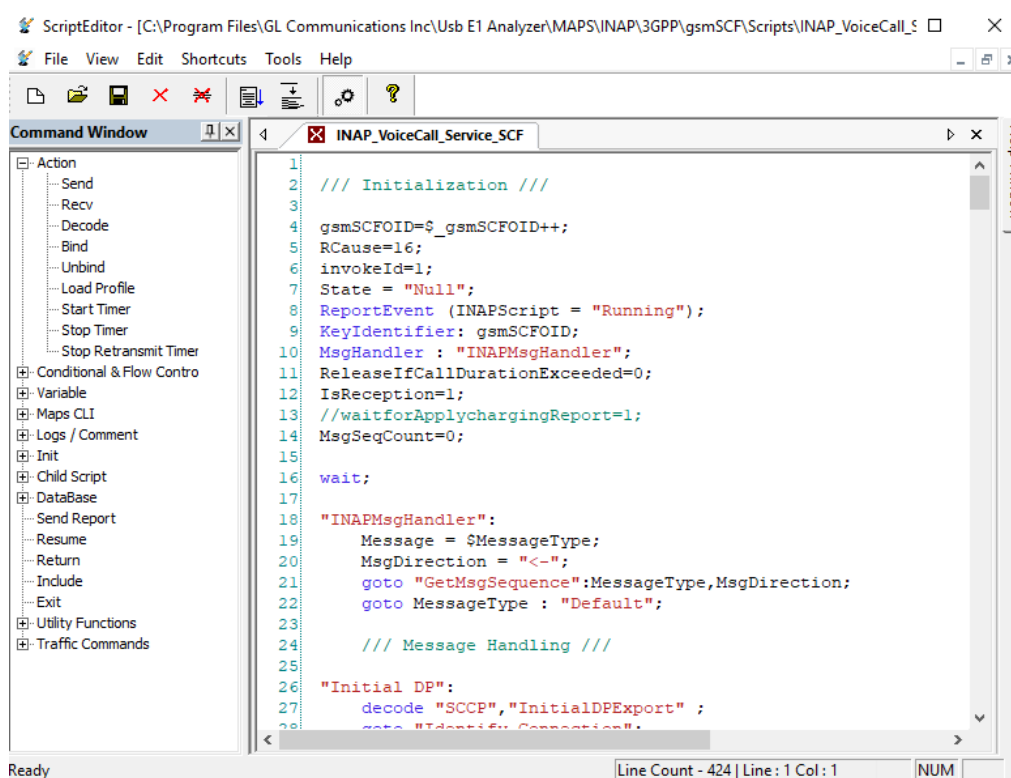
Message Editor - With message editor, users can build a template for each protocol message type. The value for each field may be changed in the message template prior to testing. The protocol fields comprises of mandatory fixed parameters, mandatory variable parameters, and optional variable parameters.
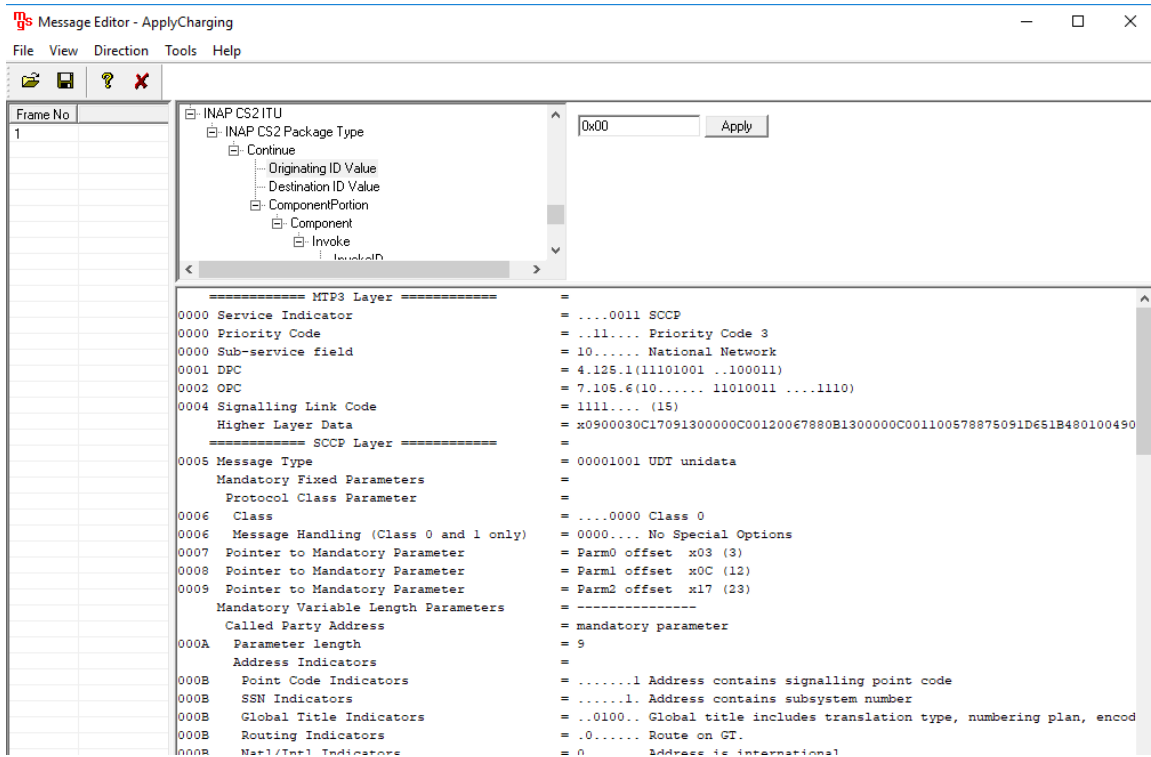
Message Editor

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

GL Communications Inc.
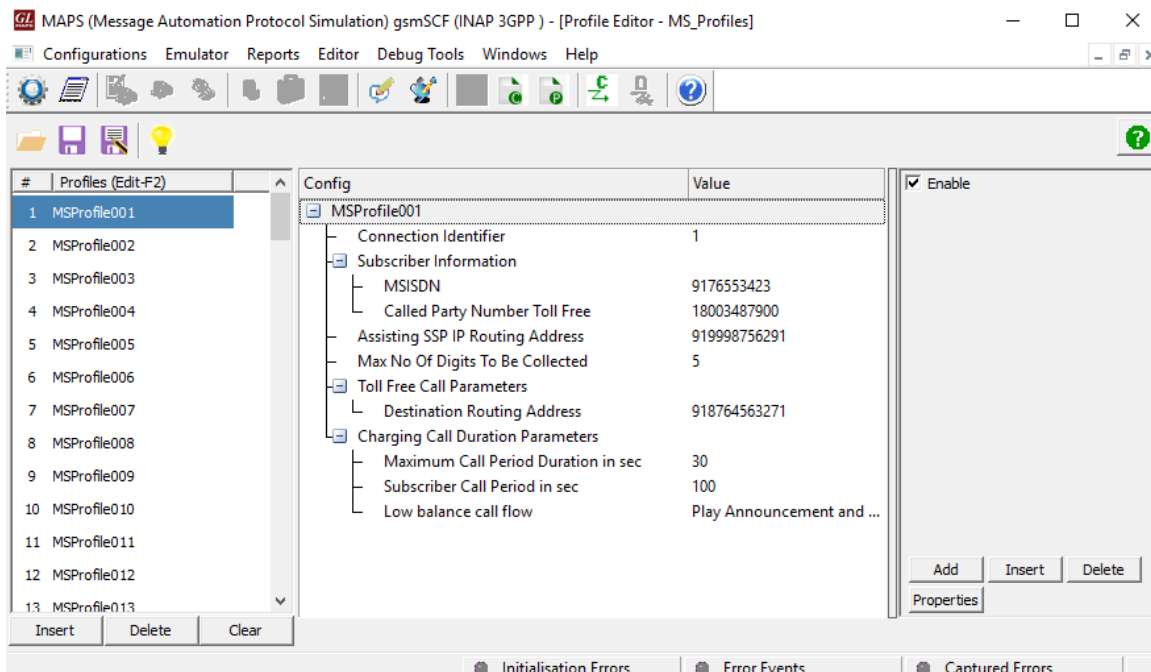
Call Generation and Call Reception

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 may be started manually or they can be automatically triggered by incoming messages.

Call Generation

Call Reception

GL Communications Inc.

Event Log

Incoming Call Handler Configuration

The script configuration option is used to preset the script required to handle all possible signaling and call control messages against particular message expected to arrive.

Incoming Call Handler Configuration for MTP2

◈ GL Communications Inc.

INAP Services - ANSI (IP and ATM)

MAPS™ INAP supports various procedures defined as per ANSI specification such as CNAM (Calling Name Delivery), LNP (Local Number Portability), and 800 Toll-free Number Service.
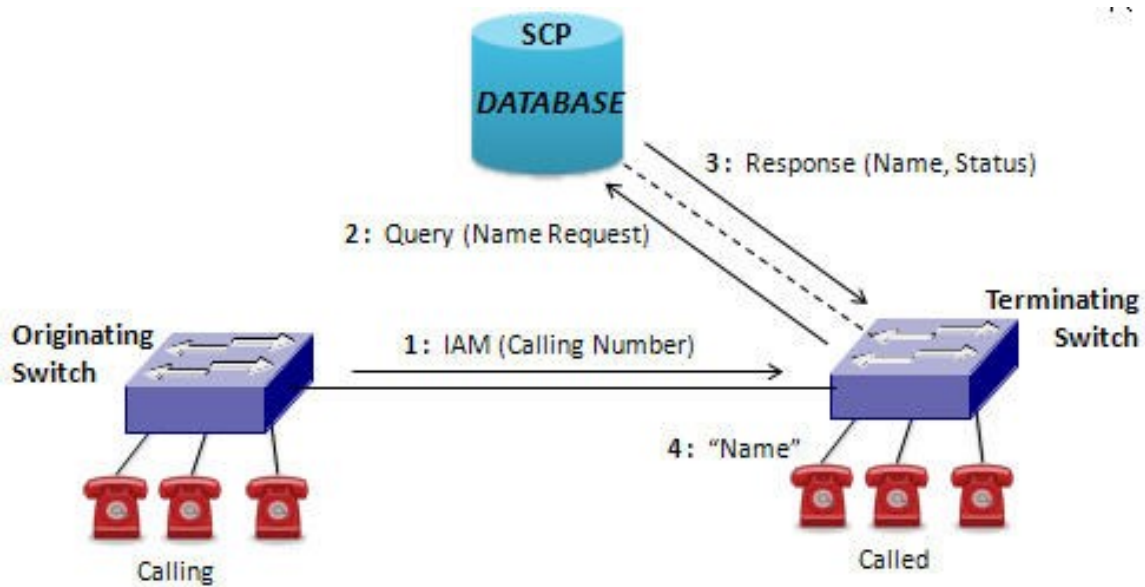
CNAM (Calling Name Delivery) Service

LNP (Local Number Portability) Service

GL Communications Inc.
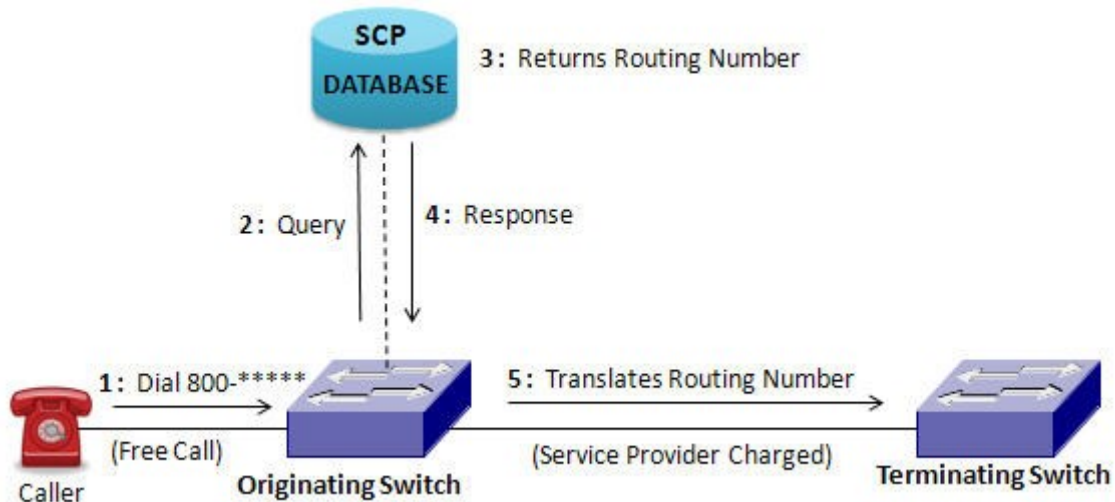
Toll-free 800 Number Service

INAP Services - ITU

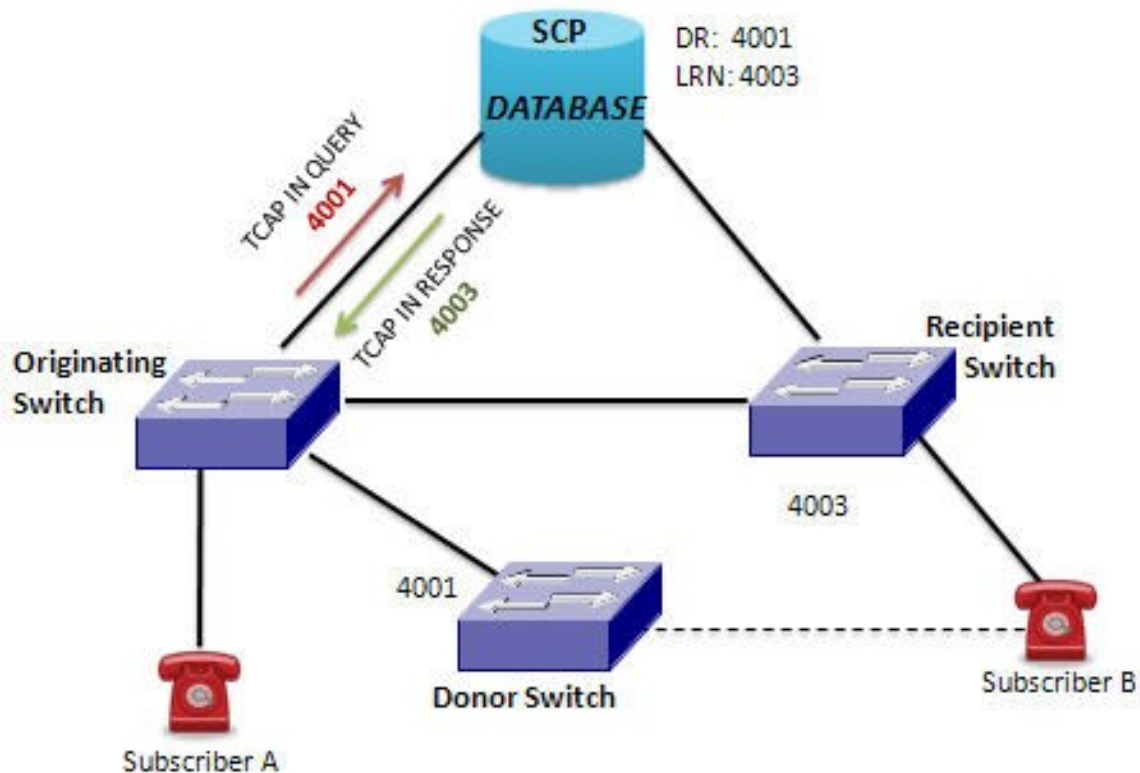MAPS™ INAP supports various services defined as per ITU-T specification such as Prepaid Voice Call, Low Balance Voice Call (playAnnouncement and Release), Toll-free Voice Call, and Initiate Call Attempts (ICA) services.
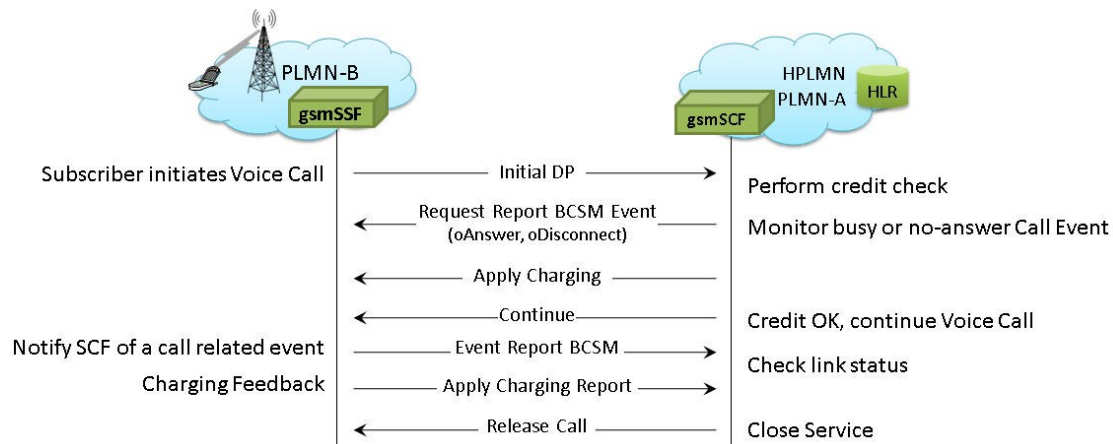
Prepaid Voice Call Service

Low Balance Voice Call Service

GL Communications Inc.
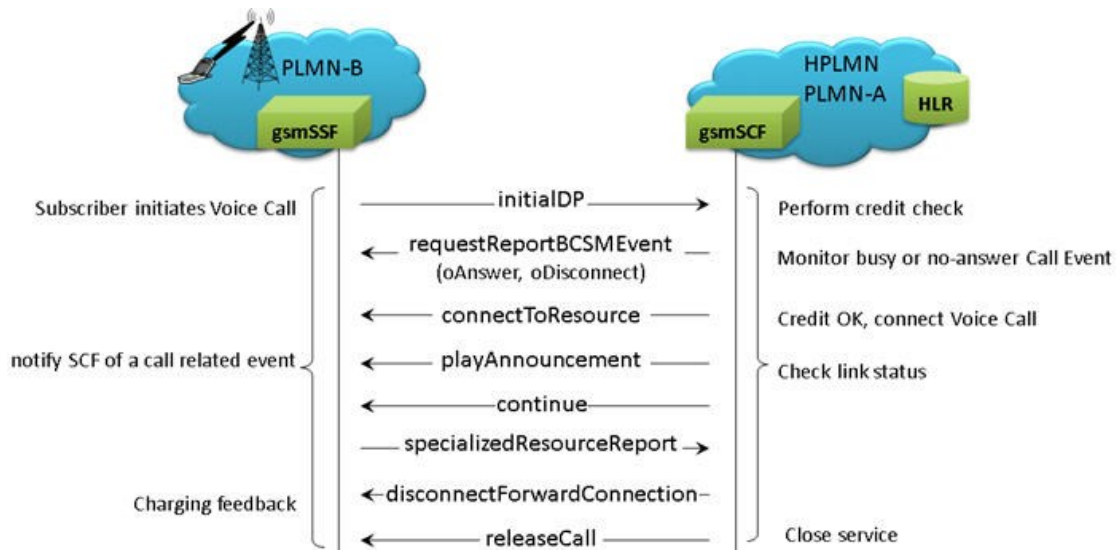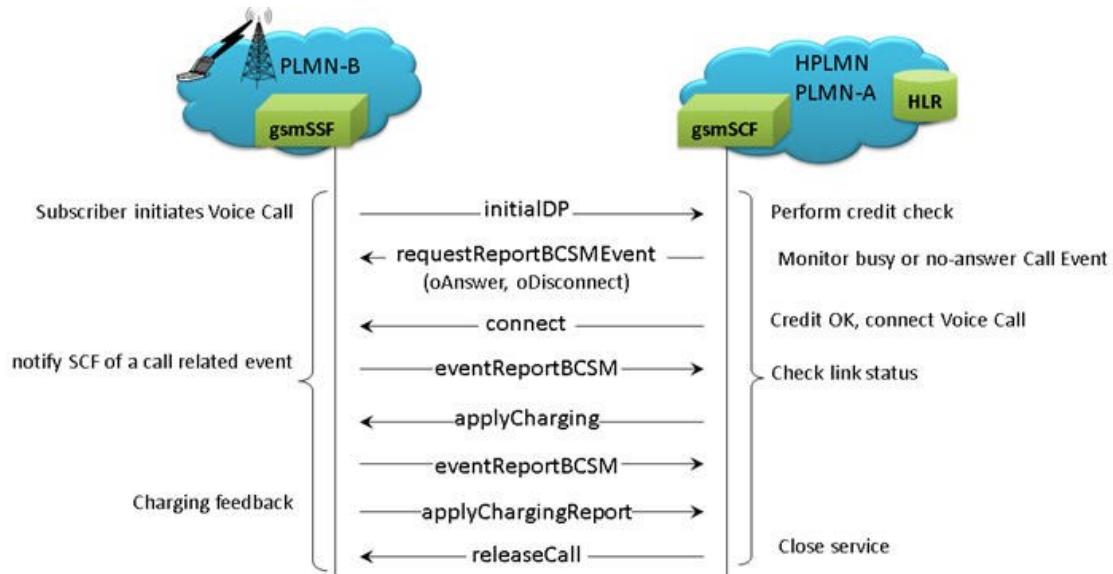
Toll Free Voice Call Service
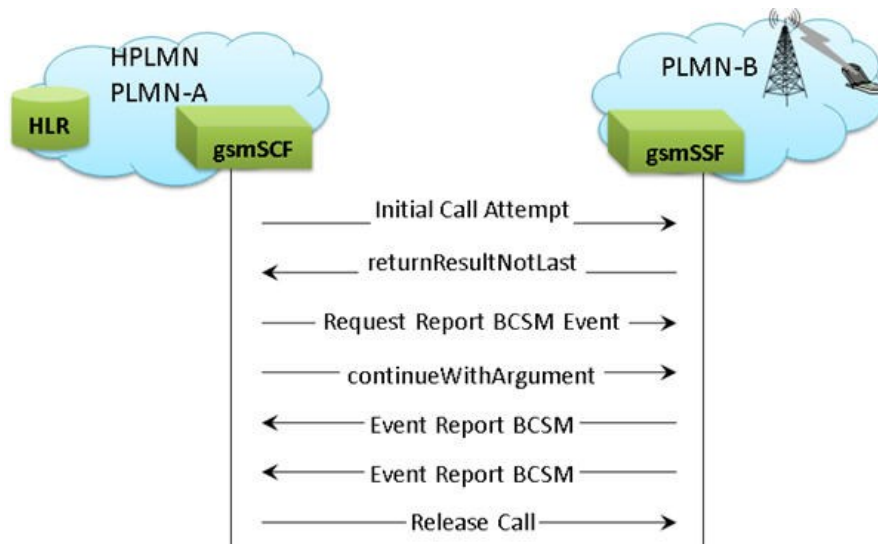
Initiate Call Attempts (ICA) Service

Supported Protocols and Specifications

Supported Protocols	Standard / Specification Used
ITU INAP CS2	EN 301 140-1 V1.3.4 (1999-06)
TCAP	ANSI T1.114-1996
SCCP	Q.713, CCITT (ITU-T) Blue Book
MTP	Q.703, ITU-T Blue Book

GL Communications Inc.

ANSI INAP	CNAM
TCAP	
SCCP	
MTP3	
M2PA	M2UA
SCTP	
IP	

Supported Protocols	Standard / Specification Used
CNAM	GR-118-CORE
LNP	GR 1299 CORE
TCAP	ANSI T1.114-1996
SCCP	ANSI T1.112-1996
MTP	ANSI T1.111-1996
SCTP	RFC 4960

ITU INAP	
TCAP	
SCCP	
MTP3	M3UA
M2PA	
SCTP	
IP	

Supported Protocols	Standard / Specification Used
ITU INAP CS2	Q.1228
TCAP	ANSI T1.114-1996
SCCP	Q.713, CCITT (ITU-T) Blue Book
M3UA	RFC 3332
M2PA	RFC 4165

INAP
TCAP
SCCP
MTP3b
SSCOP
AAL5
ATM
Physical Layer
INAP over ATM

Supported Protocols	Standard / Specification Used
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)

ANSI INAP	CNAM
TCAP	
SCCP	
MTP3b	
SSCOP	
AAL5	
ATM	
Physical Layer	
ANSI INAP over ATM	

Supported Protocols	Standard / Specification Used
CNAM	GR-118-CORE
LNP	GR 1299 CORE
TCAP	ANSI T1.114-1996
SCCP	ANSI T1.112-1996
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)

Buyer's Guide

Item No	Product Description
PKS136	MAPS™ INAP over IP Emulator
XX656	MAPS™ INAP over TDM Emulator (Requires T1 or E1 Hardware and Software)

Item No	Related Software
XX649	MAPS™ ISUP Emulator
XX696	MAPS™ SS7 CAP Emulation (CAMEL App Part)
XX695	MAPS™ SS7 BICC Emulation
XX120	SS7 Analysis Software

Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer with Basic Analyzer Software
XTE001	Dual T1 E1 Express (PCIe) Boards (requires additional licenses)
FTE001	QuadXpress T1E1 Main Board (Quad Port– requires additional licenses)
ETE001	OctalXpress T1E1 Main Board plus Daughter Board (Octal Port– requires additional licenses)

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

For more information, refer to MAPS™ INAP Emulator webpage.