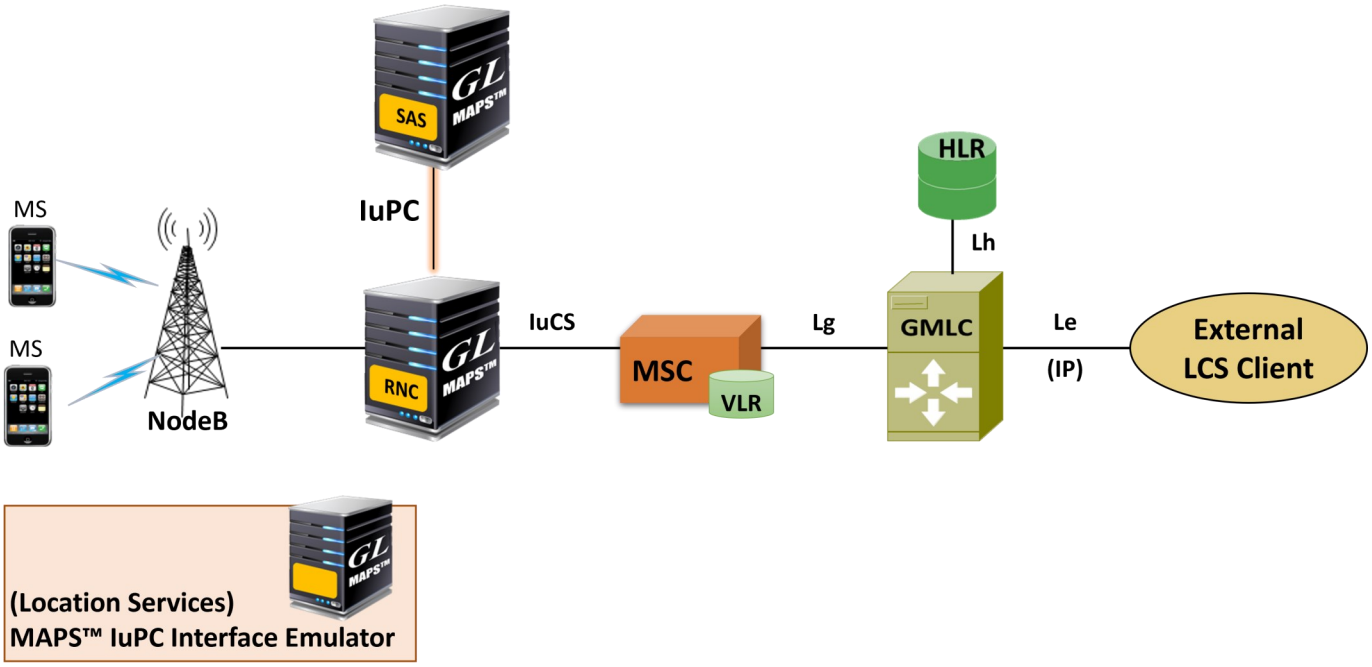
MAPS™ UMTS IuPC Interface Emulator

(Positioning Calculation Application Part (PCAP))



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.

In the LCS network, GMLC (Gateway Mobile Location Center) is the positioning node and center point of the architecture that holds the position information by communicating with other network elements within the network. All LCS clients communicates with this node to request positioning information.

GL's Message Automation and Protocol Simulation (MAPS™), platform for emulation of communication protocols, supports emulation of Location Service in UMTS network using **PCAP (Positioning Calculation Application Part) protocol** between the **Radio Network Controller (RNC)** and the **Stand-Alone SMLC (SAS)** and the associated signaling procedures as per **3GPP TS 25.305** specification.

For more information, refer to MAPS™ UMTS IuPC Interface Emulator webpage.

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Main Features

- Useful tool to perform Location services testing over RNC <-> SAS IuPC interface
- Emulates RNC (Radio Network Controller) and SAS (Stand-Alone SMLC) nodes in UTRAN
- PCAP (Positioning calculation application part) protocol is used for signaling message exchange over the IuPC interface
- Emulator can be configured as RNC, SAS nodes and study the call flow and exchange of PCAP signaling messages between these nodes
- User-friendly GUI for PCAP signaling message exchange over M3UA/SCTP and SCCP
- Ready scripts for PCAP positioning functions –
  - Positioning Calculation Service
  - SAS Centric Position Service
  - Information Exchange Service
- Provides protocol trace with full message decoding of the PCAP signaling messages
- Supports customization of placing and answering calls using Profile editor and Message editor

Testbed Configuration

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

SCTP Configuration parameters consists of source / destination IP address, port configurations to emulate RNC and SAS entities in IuPC interface. MAPS™ can then generate and receive PCAP signaling messages to/from valid IP Address in the UMTS network.

End user configuration profile used to configure MAPS™ IuPC with supported RNC and SAS parameters.

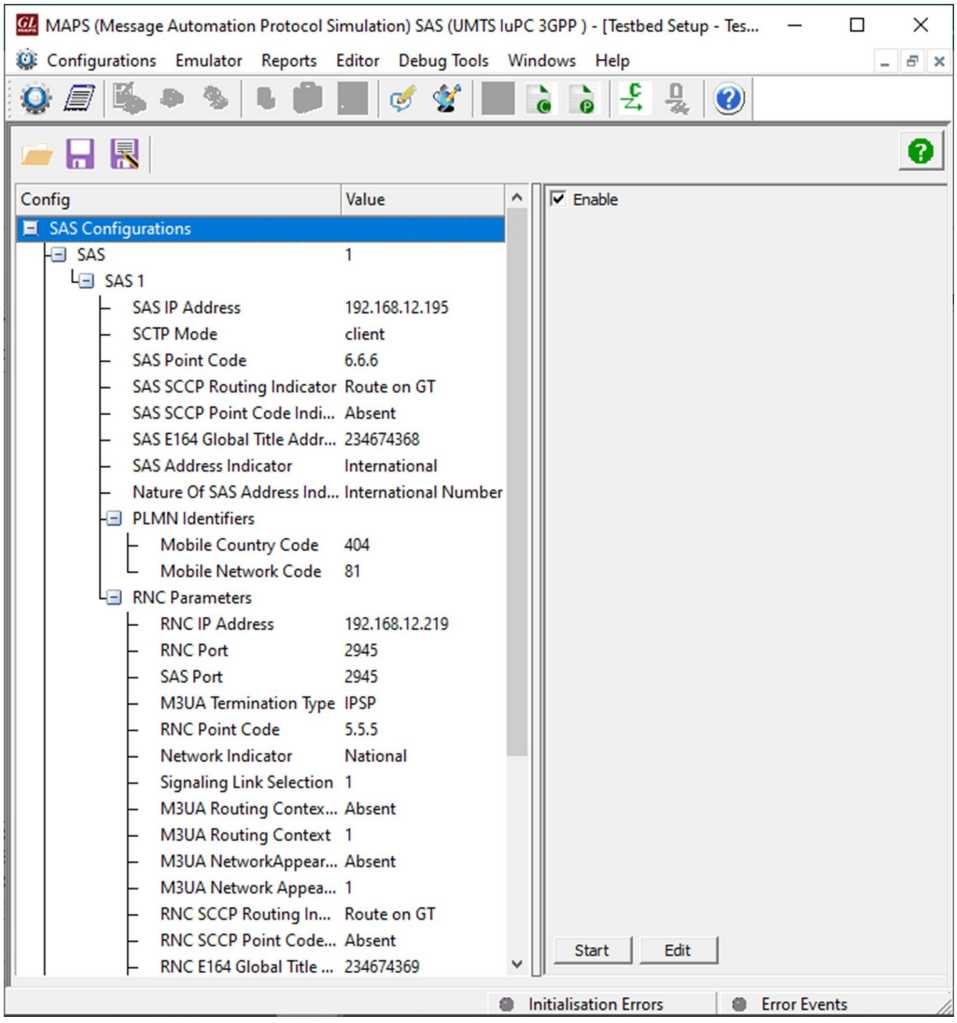


Figure: Testbed Setup

Pre-processing Tools

Message Editor

The message editor helps users to 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.

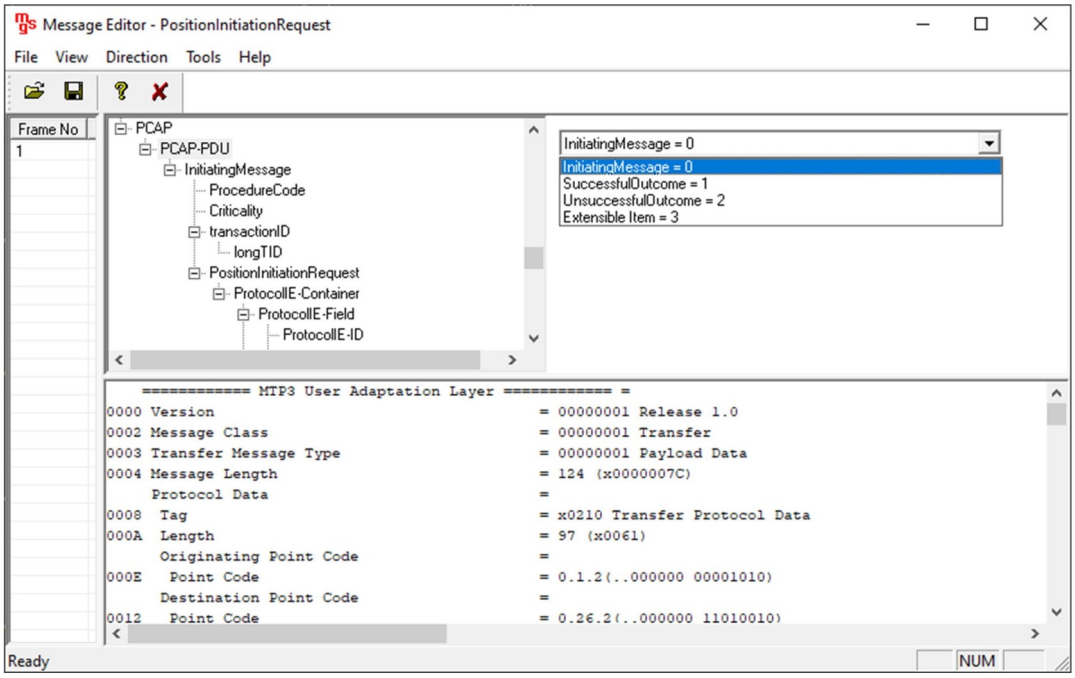


Figure: Message Editor

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.

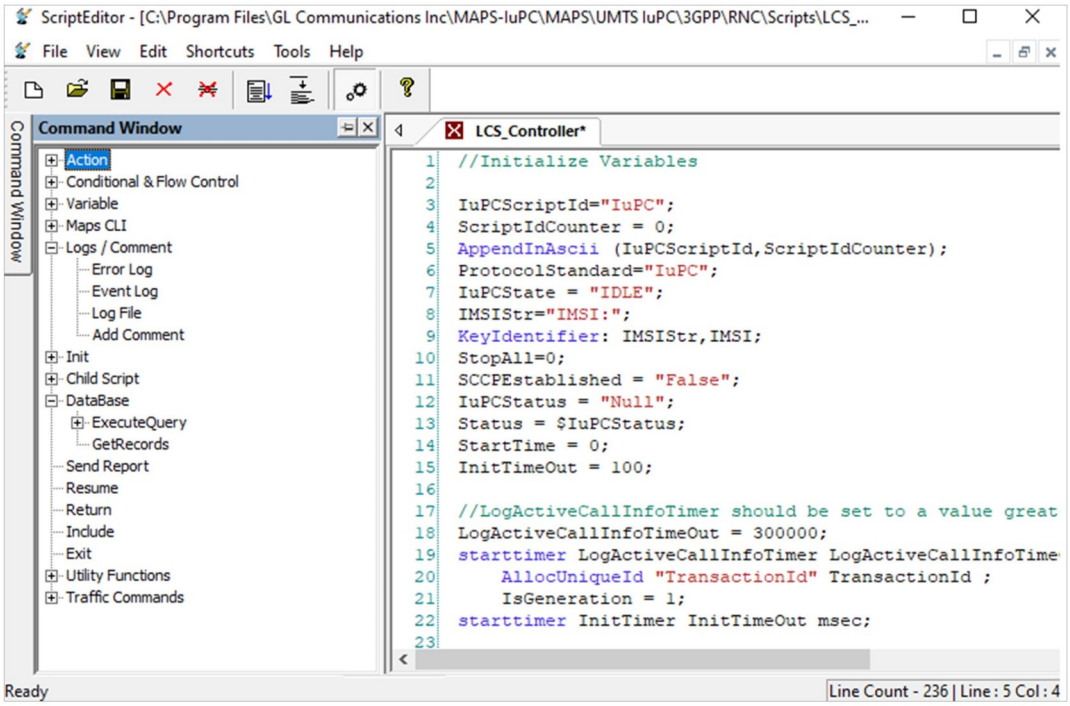


Figure: Script Editor

Pre-processing Tools *(Contd.)*

Profile Editor

Profile editor 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 parameters such as Positioning Initiation Request parameters, LCS Client type, LCS QOS, Location Estimate, Location Type, OTDOA/ GANSS/ UTDOA/ GPS Measurement Results parameters, Positioning Method, and other related configurations required for PCAP signaling emulation.

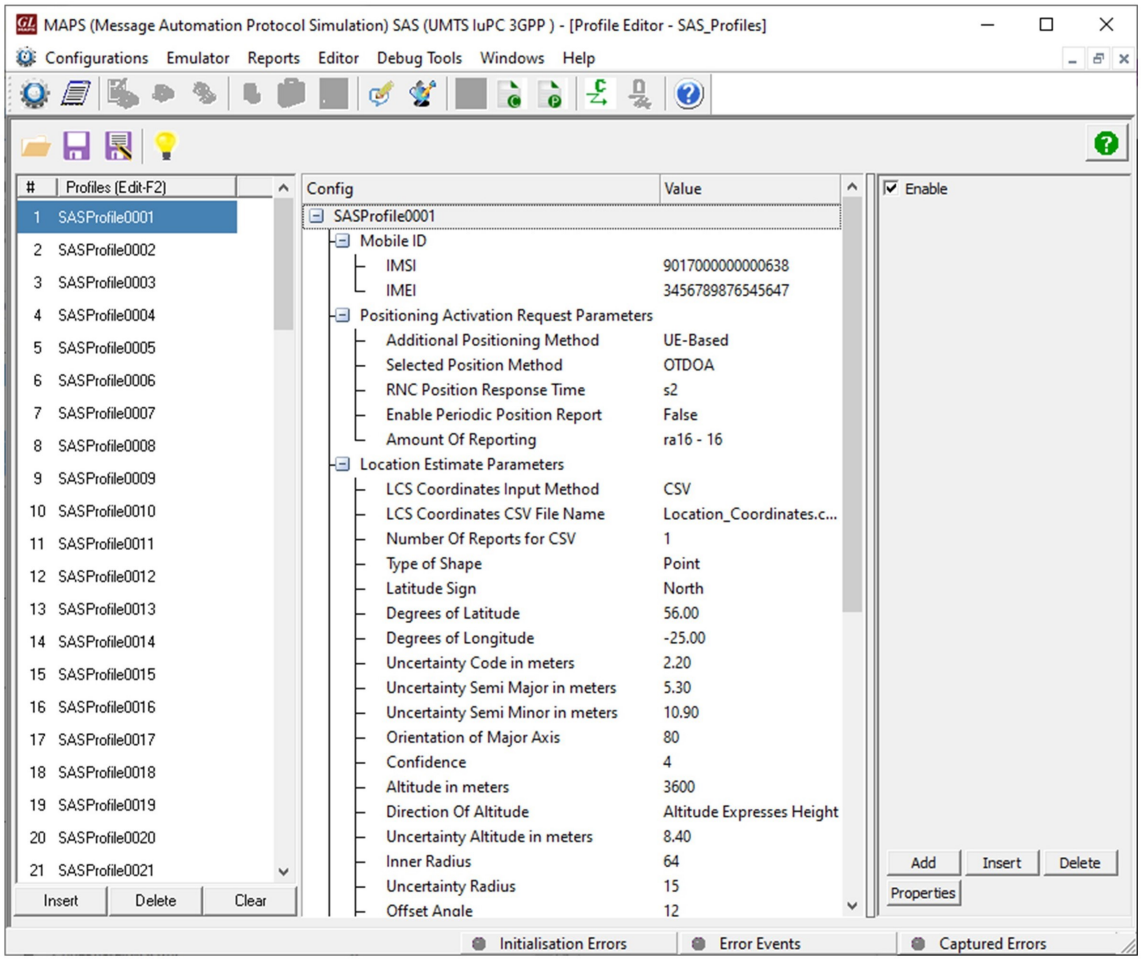


Figure: Profile Editor

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 below scenario shows MAPS™ IuPC emulator configured as RNC initiating Position Initiation Request procedure towards SAS and MAPS™ IuPC emulator configured as SAS receives and processes the Position Initiation Request procedure.

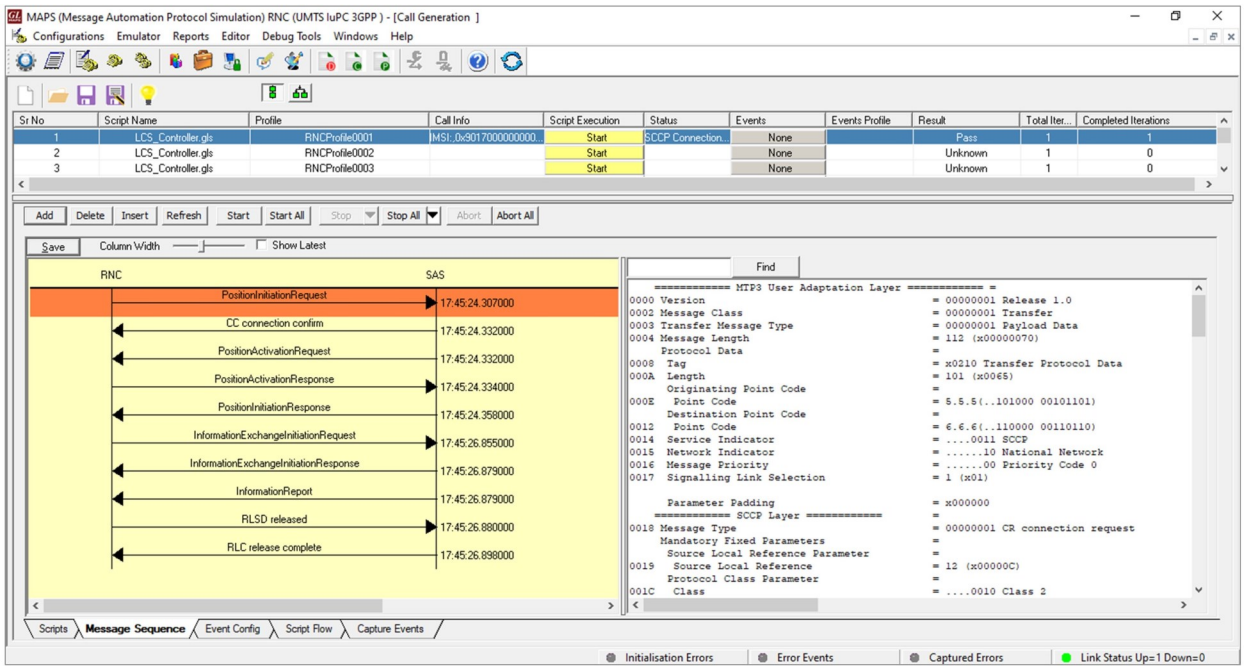


Figure: Position Initiation Request Emulation at RNC

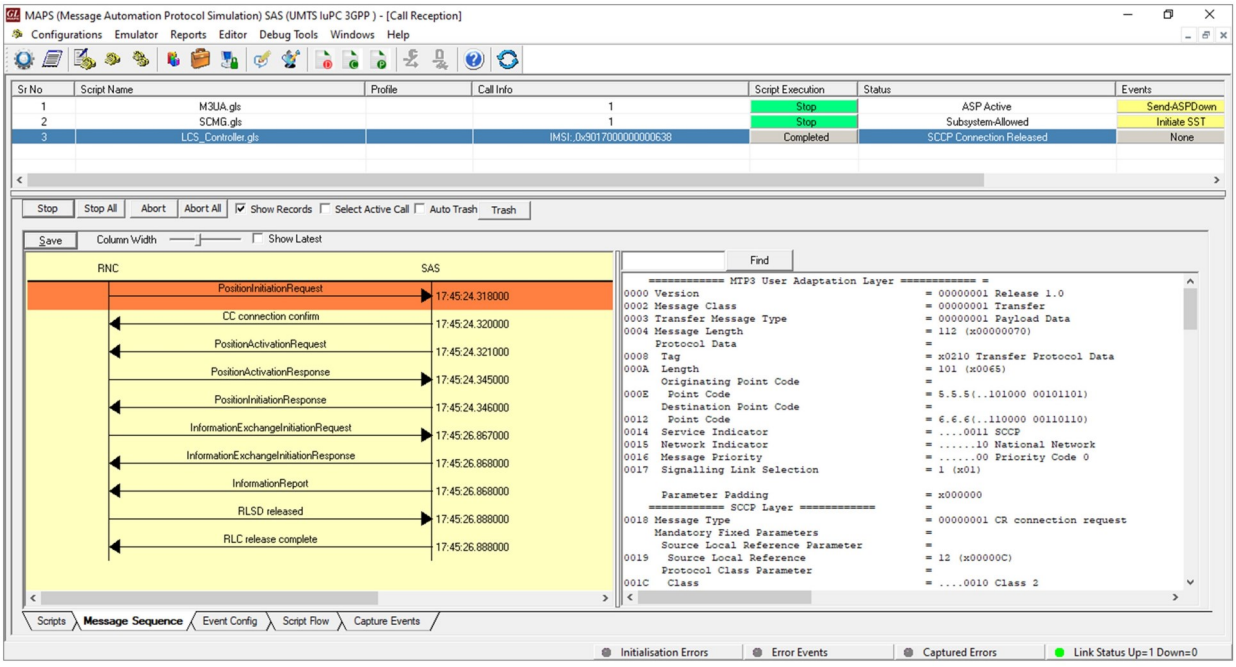


Figure: Position Initiation Request Emulation at SAS

Typical UMTS IuPC Interface Procedures

MAPS™ IuPC supports PCAP signaling message exchange between RNC and SAS, which are categorized as follows:-

- Positioning Calculation Service
  - Position Calculation
  - Position Parameter Modification
- SAS Centric Position Service:
  - Position Initiation
  - Position Activation
  - Position Periodic Report
  - Position Periodic Termination
- Information Exchange Service:
  - Information Exchange Initiation
  - Information Reporting
  - Information Exchange Termination

Position Initiation Request Procedure

The IuPC interface enables RNC and SAS to exchange information that is related to the positioning of a single UE, using SAS Centric mode of operation.

Position Initiation procedure is used by RNC to request from SAS the position (non-periodic or periodic) of a UE. The connection-oriented service of the signaling bearer is established in conjunction with this procedure.

Position Activation procedure enables SAS to initiate a particular positioning method used for an individual positioning event.

During Information Exchange Service, the IuPC interface enables RNC to request specific GNSS (GPS or GANSS) related data from SAS at regular intervals.

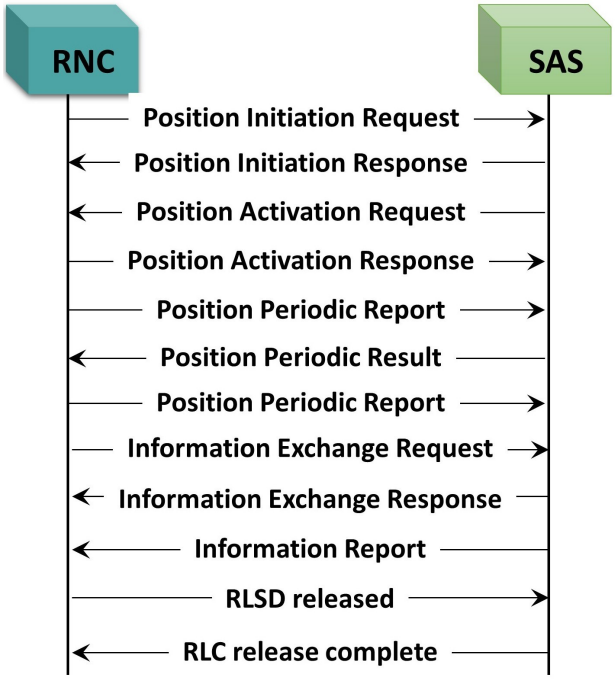
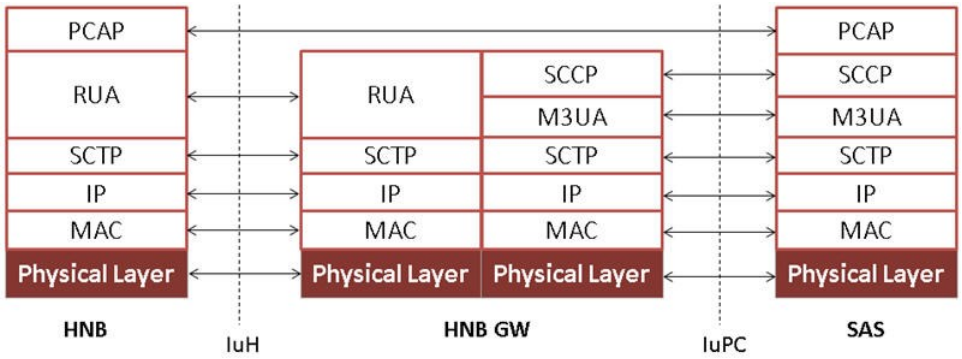


Figure: Position Initiation Request Procedure

Supported Protocols and Specifications



Supported Protocols	Standard / Specification
Positioning Calculation Application Part (PCAP)	3GPP TS 25.453
M3UA	RFC 3332
SCCP	Q.713, CCITT (ITU-T) Blue Book
SCTP	RFC 4960

Buyer's Guide

Item No	Product Description
PKS153	MAPS™ UMTS IuPC Interface Emulator

Item No	Related Software
PKS139	MAPS™ Diameter Emulator
PKS147	MAPS™ GSM Lb Interface Emulator
PKS148	MAPS LTE SLs Interface Emulator
PKS142	MAPS™ LTE eGTP (S3, S4, S5, S8, S10, S11 and S16) Interfaces
PKS164	MAPS™ UMTS – IuPS Interface Emulation
PKS160	MAPS™ UMTS – IuCS and Iuh Interface Emulation
PKS166	MAPS™ UMTS Gn Gp Emulator
PKS137	MAPS™ GSM A IP Emulator
ETH100	Mobile Traffic - PacketCheck™
ETH101	MobileTrafficCore - GTP
ETH102	MobileTrafficCore - Gateway

For more information, please visit Signaling and traffic simulator webpage.

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