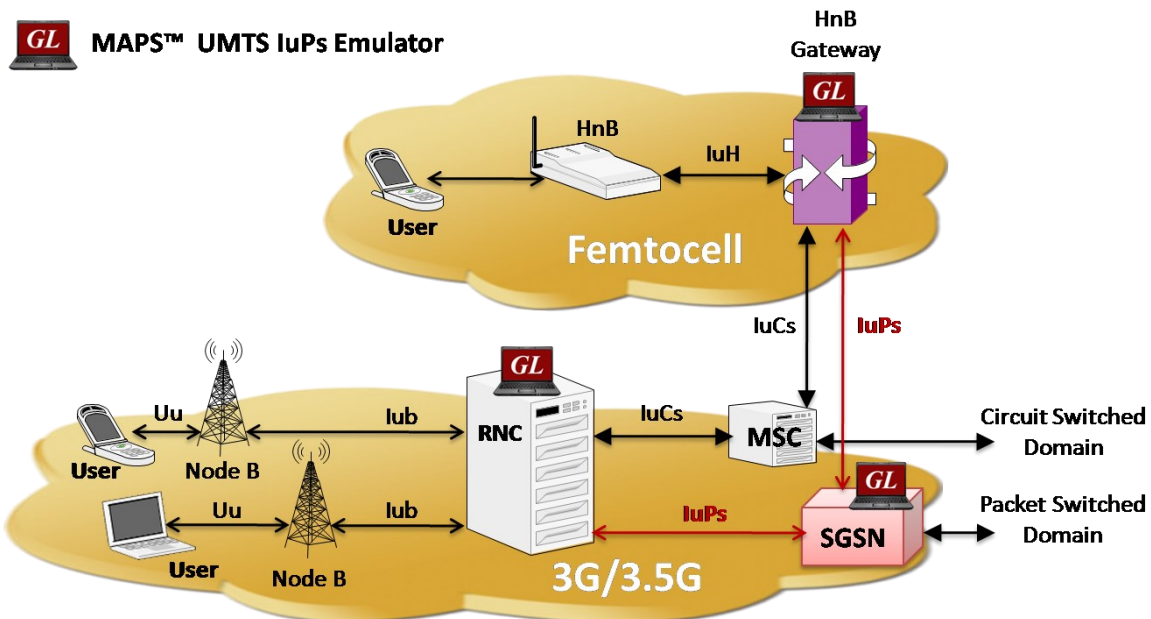# MAPS™ UMTS IuPS Interface Emulator

(Universal Mobile Telecommunications System)

Overview

UMTS, or Universal Mobile Telecommunications System is a 3rd generation mobile technology evolved from GSM technology. It uses W-CDMA (Wideband Code Division Multiple Access) as radio access. With increased spectral efficiency and high bandwidth, UMTS can support broadband data, voice and video. The underlying transport for UMTS in the core network can be Asynchronous Transfer Mode (ATM), or IP. UMTS supports integrated services such as multimedia and global roaming to mobile users. In essence, UMTS IuPs interface is the Gateway to the World Wide Web. More precisely, IuPs, as depicted, is the interface between the RNC (Radio Network Controller) and the SGSN (Serving GPRS Support Node).

GL's Message Automation & Protocol Simulation (MAPS™) designed for UMTS - IuPS interface can simulate RNC (Radio Network Controller), and 3G SGSN (3G Serving GPRS Support Node) by generating RANAP and DTAP signalling messages over SCTP as Transport layer in an IP network as defined by 3GPP standards.

The application gives the users the unlimited ability to edit RANAP messages and call control scenarios (message sequences). "Message Sequences" are generated through scripts. "Messages" are created using message templates.

The product also supports Mobile traffic core – GTP (ETH101) user-plane packet simulation and Mobile Traffic Core – Gateway (ETH102) and External Gateway (ETH102) Traffic simulation. These modules also support generation and verification of data traffic such as Email, FTP, Web (HTTP), Video, and more.

For more information, please visit MAPS™ UMTS-IuPS Interface Emulation webpage.

Main Features

- Simulates RNC, and SGSN.
- Provides fault insertion, and erroneous call flows testing capability.
- Supports all Mobility Management, Session Management, RANAP and DTAP messages.
- Ready scripts for Mobile Originating, Mobile Terminating, Location Updating, GPRS Attach, and Detach procedures for quick testing.
- Supports M3UA termination type as a signaling gateway process (SGP), an application server process (ASP), or an IP server process (IPSP).
- Supports Authentication, TMSI Reallocation, Encryption, and other optional procedures.
- Supports Packet, Mobile, Gateway, and External Gateway traffic simulation (requires additional licenses)
- Impairments can be applied to messages to simulate error conditions.
- Supports customization of call flows and message templates using Script and Message editor.
- Supports scripted call generation and automated call reception.

Testbed Configuration

The configuration window allows users to setup the required test environment with UMTS IuPS interface configurations.

Test Bed includes various configurations including node (RNC and MSC) parameters, MTP layer parameters, Network Adaptor, and Default profile. Once the transport layer is configured properly, protocol specific signaling messages and traffic can be transmitted and received successfully.
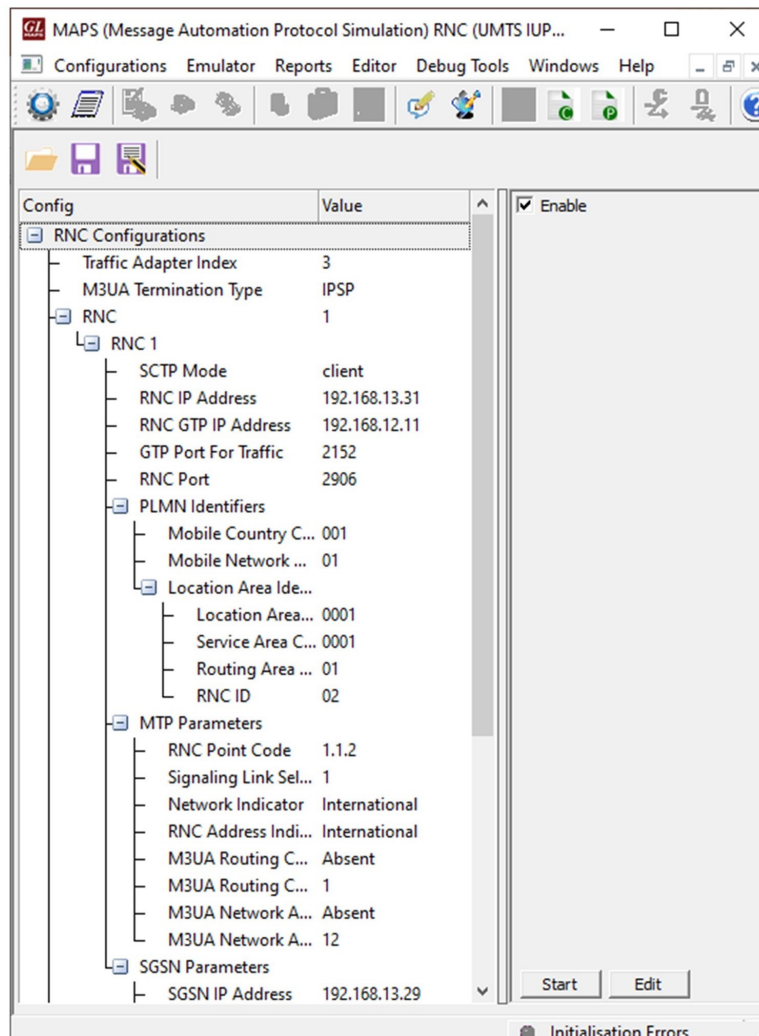

Figure: Testbed Configuration

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Pre-processing Tools

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.

Users can also configure the parameters for supporting Packet, Mobile, Gateway, and External Gateway traffic.
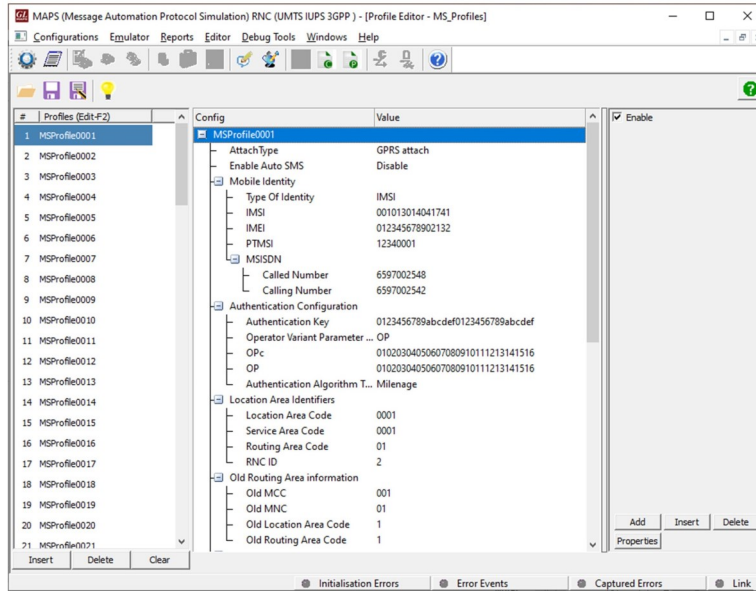

Figure: ProfileEditor

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.
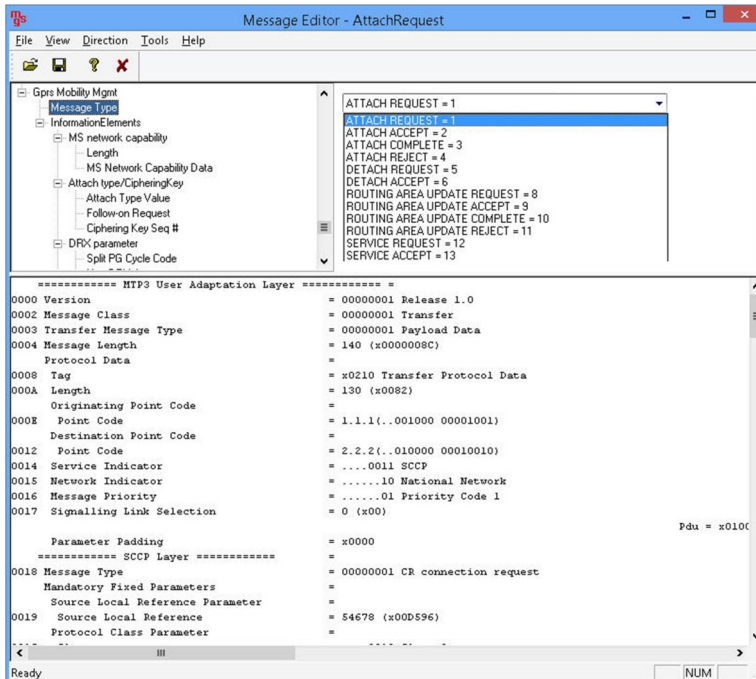

Figure: Message Editor

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Pre-processing Tools *(Contd.)*

script editor

The script editor allows the user to create / edit scripts and also import/export files that define variables for the message template parameters. The script uses pre-defined message templates to perform send and receive actions.
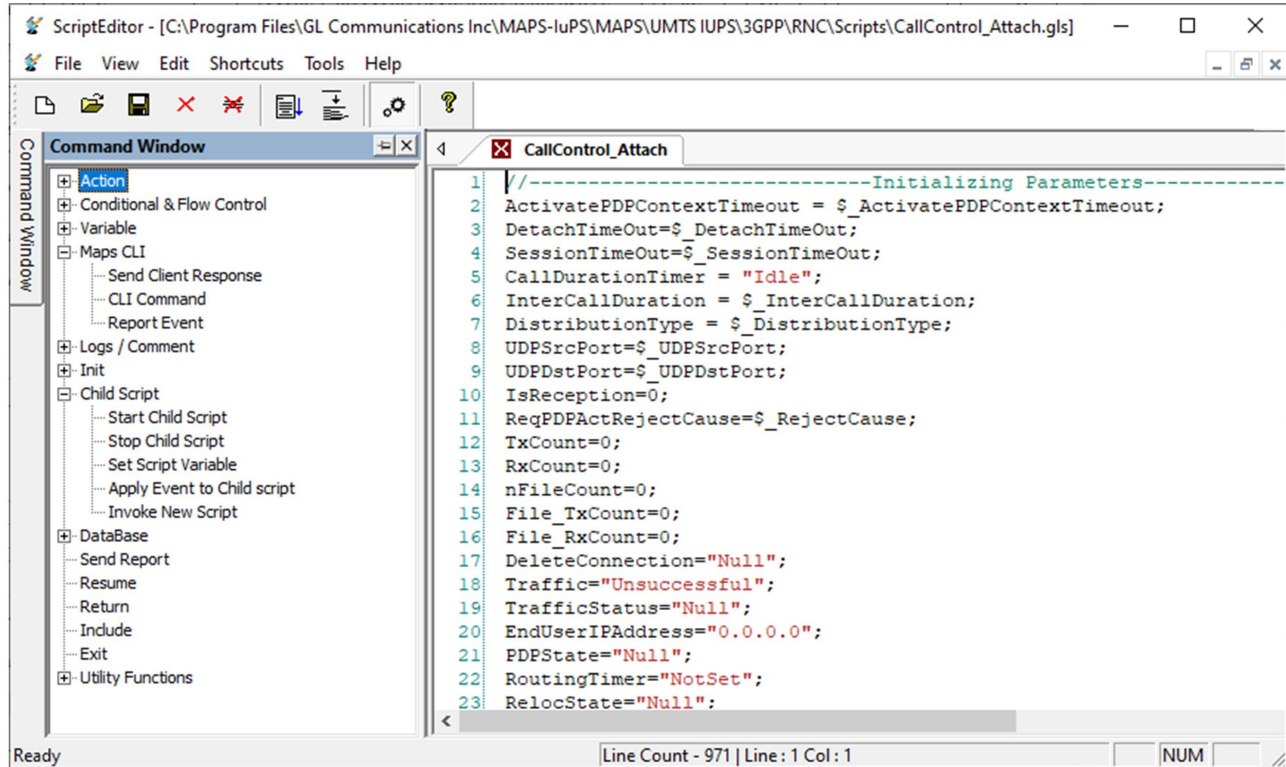

Figure: Script Editor

Call Generation and Reception

In call generation, MAPS™ is configured to send-out messages, while in call receive mode, it is configured to receive incoming messages and reply-back. Tests can be configured to run once, multiple iterations and continuously. Also, allows users to create multiple entries using quick configuration feature.

The Call Generator and Call Receiver both can be configured 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 Tx test scripts can be started manually and the Rx scripts are automatically triggered with the incoming initial messages.
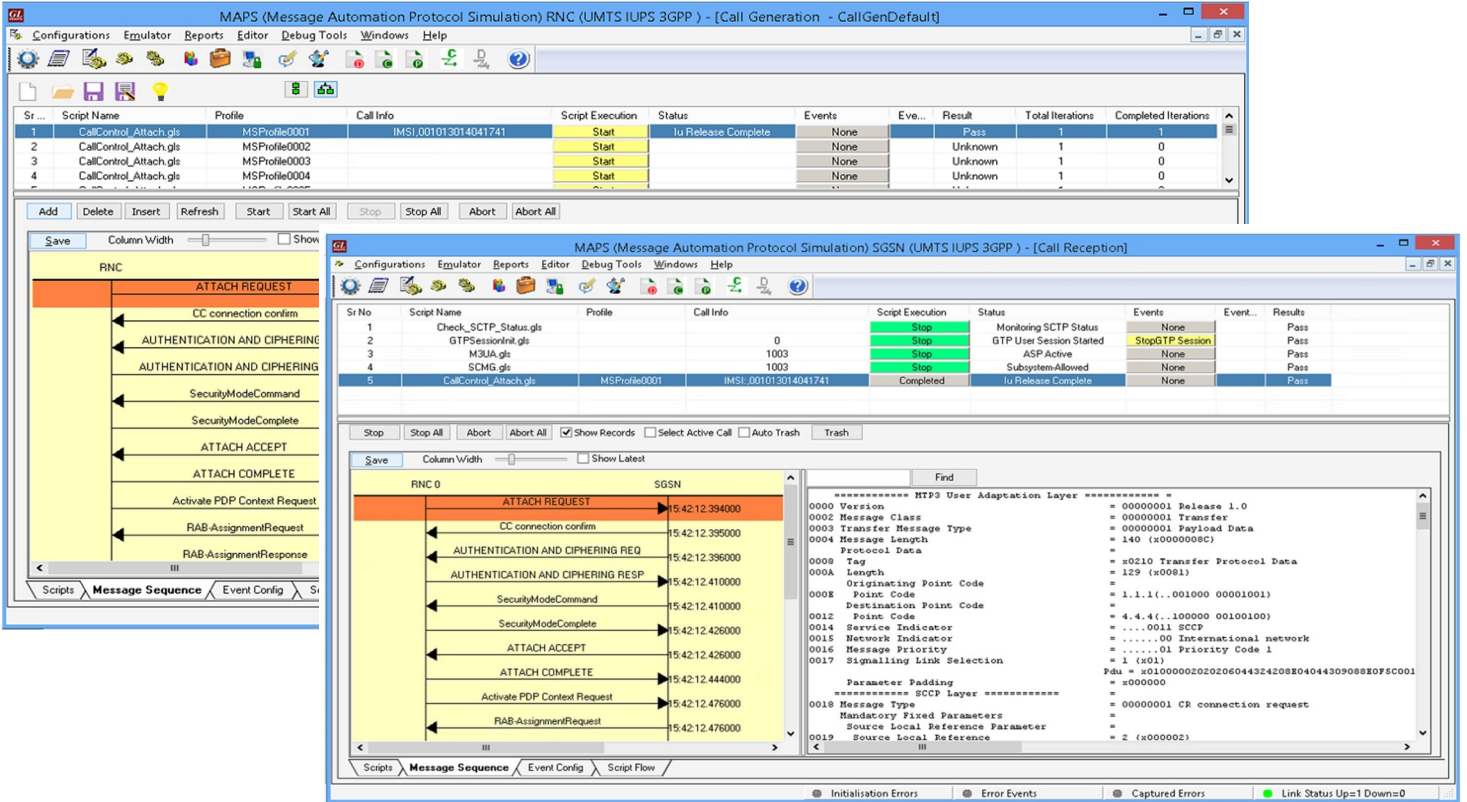

Incoming Call Handler Configuration

Users can pre-configure the scripts required to handle the incoming call requests from other entity automatically. This configuration applies to only messages which initiate call or transactions.

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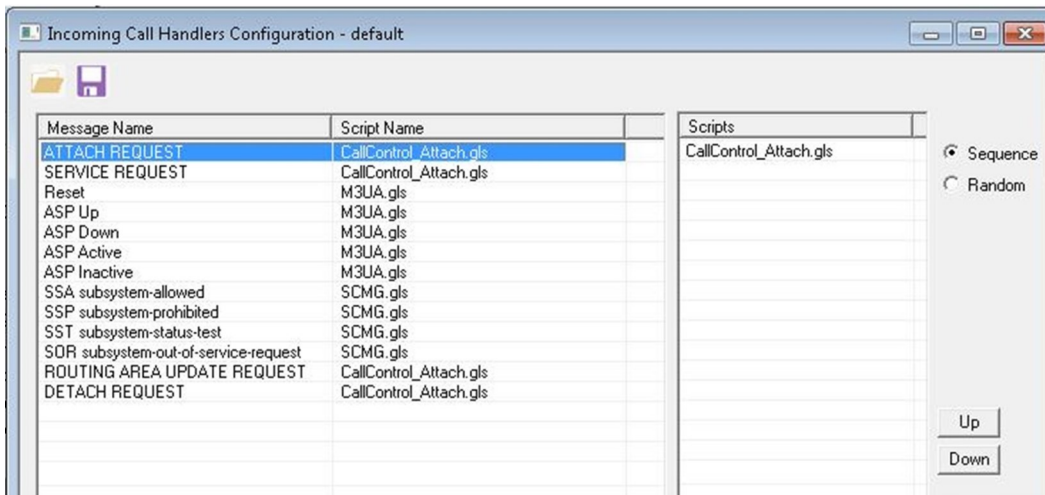
Typical UMTS IuPS Call Procedure

MAPS™ UMTS IuPS is configured to act as RNC and initiates the call flow by sending **ATTACH REQUEST** to the DUT (SGSN).

This expects **CC Connection Confirm** message from the SGSN end for successful SCCP connection. The SGSN end may start Authentication, Security Mode Control, and Identification procedures. The P-TMSI allocated is then included in the **ATTACH ACCEPT** message. MS uses the new temporary identity for GPRS services and an **ATTACH COMPLETE** message is returned to the network.
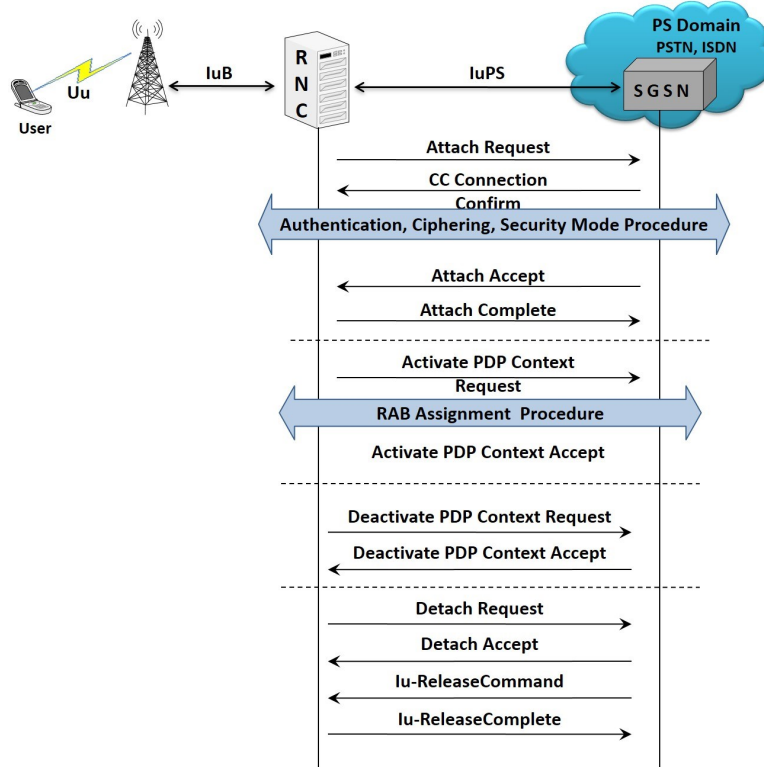

Paging Procedure

Paging is used by the network (SGSN) to request RNC that the establishment of PS signalling connection or to prompt the mobile to re-attach if necessary as a result of network failure. The network(SGSN) shall initiate the paging procedure using P-TMSI when user data is pending to be sent to the MS (RNC). The network may page only MSs (RNC's) which are GMM-REGISTERED and identified by a local P-TMSI.

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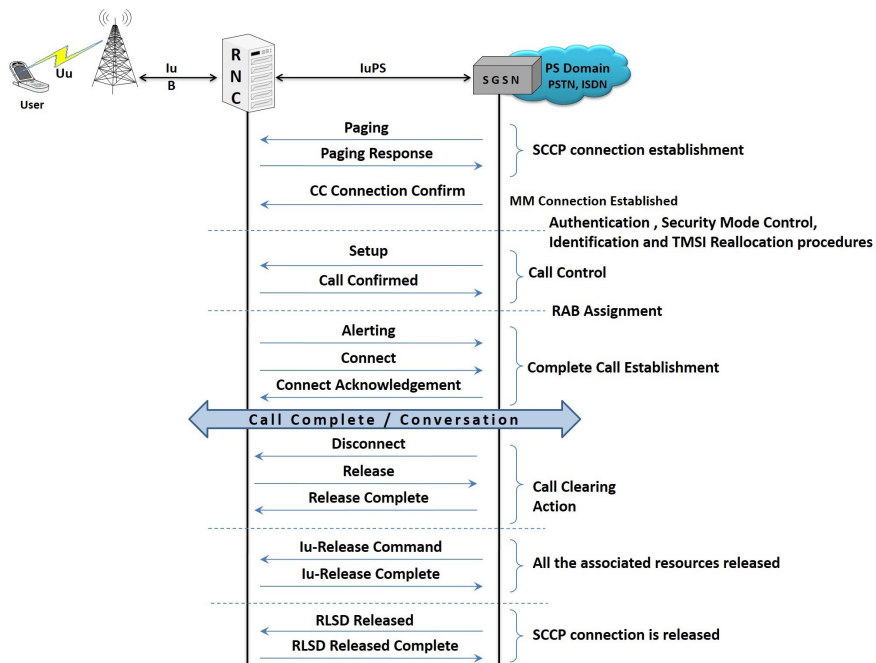
Relocation Procedure

This procedure is only performed for a UE in CONNECTED state where the Iur interface carries both the control signaling and the user data. The Serving SRNS Relocation procedure is used to move the connection between the RAN and the CN for the source SRNC to the RAN for the target RNC, from a "standing still position". In the procedure, the Iu links are relocated. If the target RNC is connected to the same SGSN as the source SRNC, an Intra-SGSN SRNS Relocation procedure is performed.

Here both Source RNC and Target RNC are simulated within single MAPS™ testbed.
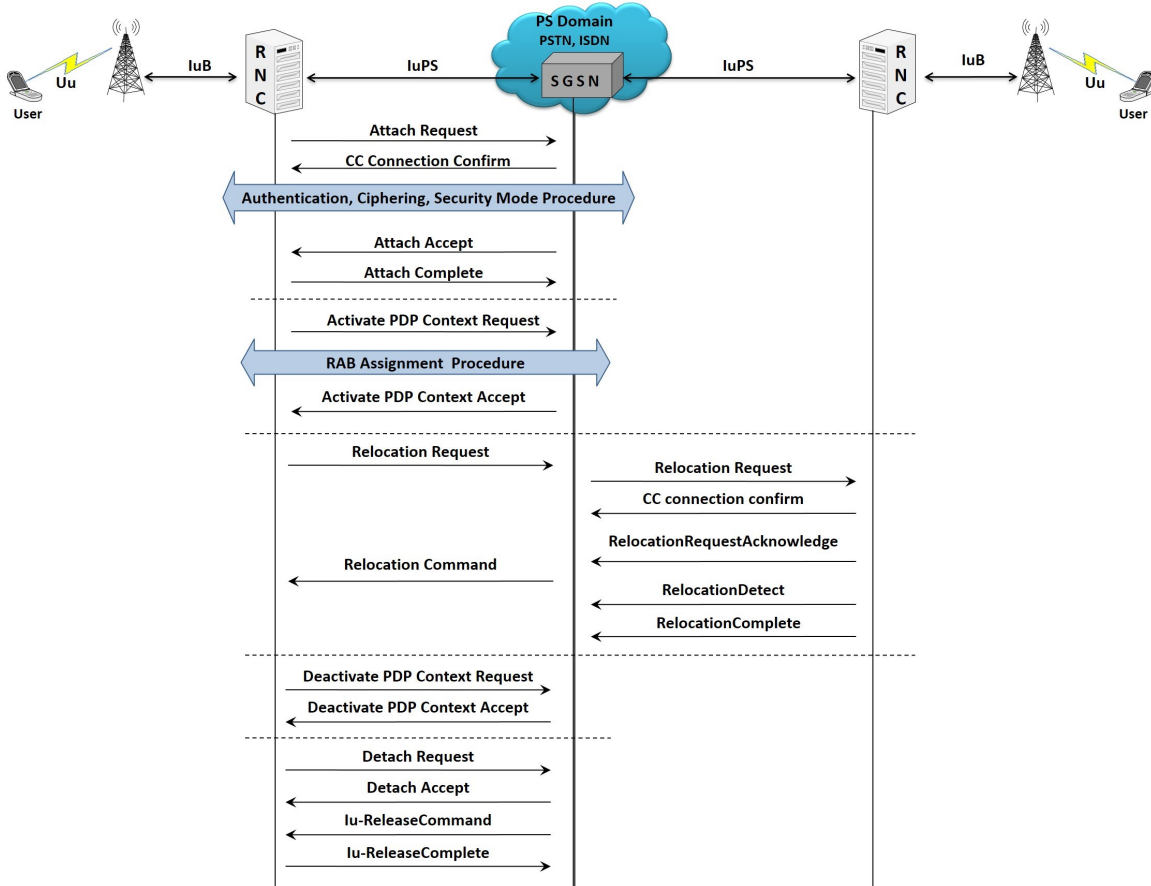
Supported Protocols and Specifications

Supported Protocols	Standard / Specification Used
SCTP	RFC 4960
SCCP	Q.713, CCITT (ITU-T) Blue Book
M3UA	RFC 3332
RANAP	3GPP TS 25.413 V9.1.0
GMM / SM	GPP TS 24.008 V5.16.0 (2006-06)
SMS	3GPP TS 03.40 V7.5.0 & 3GPP TS 04.11 V7.1.0 GSM 03.38 version 7.2.0 Release 1998

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Buyer's Guide

Item No	Product Description
PKS164	MAPS™ UMTS - IuPS Interface Emulation
ETH100	Packet Traffic - GTP
ETH101	MobileTrafficCore - GTP
ETH102	MobileTrafficCore - Gateway External Gateway Traffic Simulation

Item No	Related Software
PKS160	MAPS™ UMTS - IuCS and Iuh Interface Emulation

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