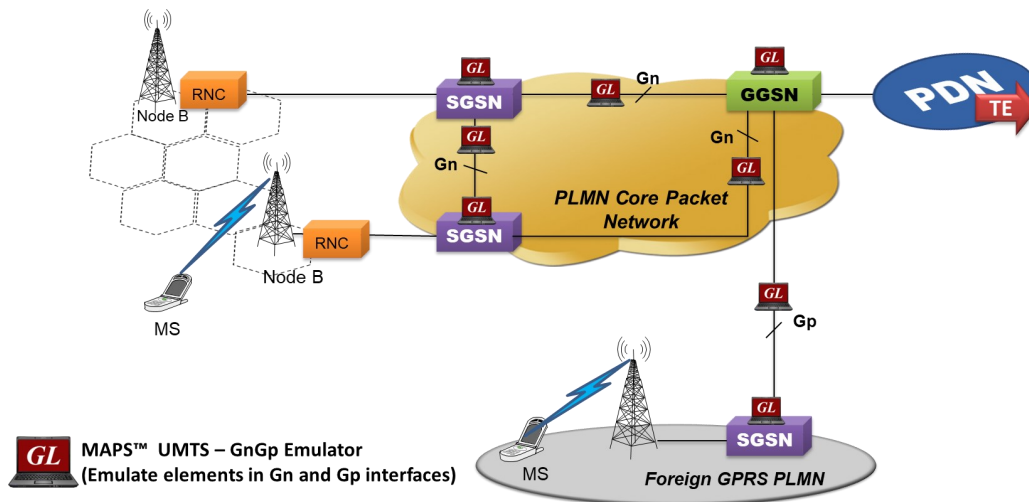# MAPS™ UMTS – GnGp Interfaces Emulation

(Emulate UMTS Gn and Gp over IP)

Overview

GPRS and UMTS are evolutions of the Global System for Mobile Communications (GSM) networks. GPRS is a 2.5G mobile communications technology that enables mobile wireless service providers to offer their mobile subscribers with packet-based data services over GSM networks. The GPRS/UMTS packet core is primarily composed of two major network elements Gateway GPRS Support Node (GGSN) and Serving GPRS Support Node (SGSN).

GL's MAPS™ GnGp Interface Emulator is an advanced protocol emulator/tester for GTP emulation over Gn, Gp interfaces that can emulate GTP messages and signaling specification as defined in 3GPP TS 29.060 GPRS Tunneling Protocol (GTP) standard. The tester supports testing network elements SGSN and GGSN, error tracking, regression testing, and load testing/call generation. It can run pre-defined test scenarios against GTP interface test objects in a controlled and deterministic manner.

GTP Interface Emulator supports powerful utilities like Message Editor, Script Editor, and Profile Editor which allow new scenarios to be created or existing scenarios to be modified using GTP messages and parameters.

GL's MAPS™ GnGp supports user-plane packet transmission and reception with purchase of Mobile Traffic Core - GTP (ETH101) licenses and supports emulation of user-plane Gateway traffic in UMTS network with purchase of Mobile Traffic Core – Gateway (ETH102) licenses. High-volume user-plane traffic emulation is possible with support of Packet Load appliance; both 4Gbps and 40Gbps variants are available to suit customer needs.

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

Main Features

- Emulates SGSN and GGSN
- Supports GTP Control plane
- Generates hundreds of Control Signaling (Load Testing)
- Generates and processes GTP messages
- Supports GTP Traffic (GTP User Plane Data) which includes: verification like BERT testing, HTTP traffic generation capability, GGSN can actually be connected to real IP network to emulate Gateway testing
- Packet Load supports High-volume GTP-u (User Plane) traffic simulation for both 4Gbps and 40Gbps variants.
- Insertion of impairments to create invalid messages
- Option to dynamically generate multiple user profiles with unique IMSI and IP Addresses
- Supports scripted call generation and automated call reception
- Provides Call Statistics and Events Status
- Supports large number of subscribers with CSV based profiles for bulk call generation

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Testbed Configuration

Testbed Setup provides options to establish communication between MAPS™ and the DUT. It includes configuration parameters to be set for GnGp configuration. Once the testbed is setup, UMTS messages can be transmitted and received over IP network to the DUT.

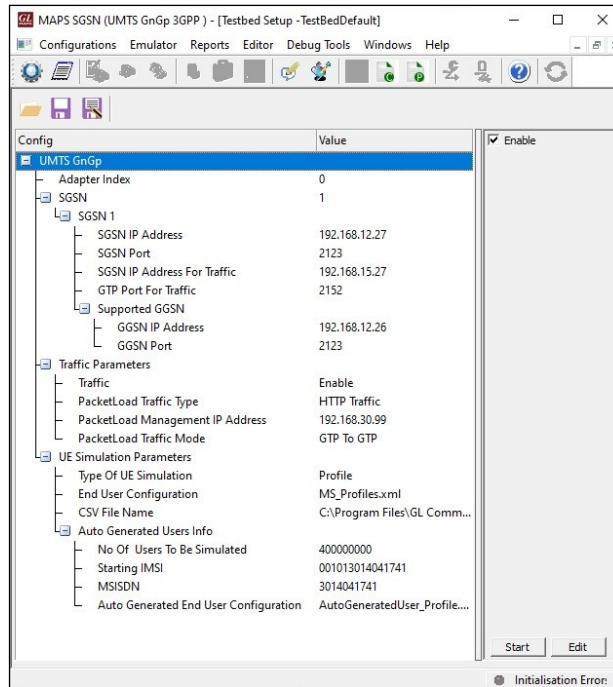End User Configuration profile is used to configure MAPS™ UMTS GnGp with SGSN or GGSN parameters.

Figure: Testbed Setup

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, and Mobile traffic.
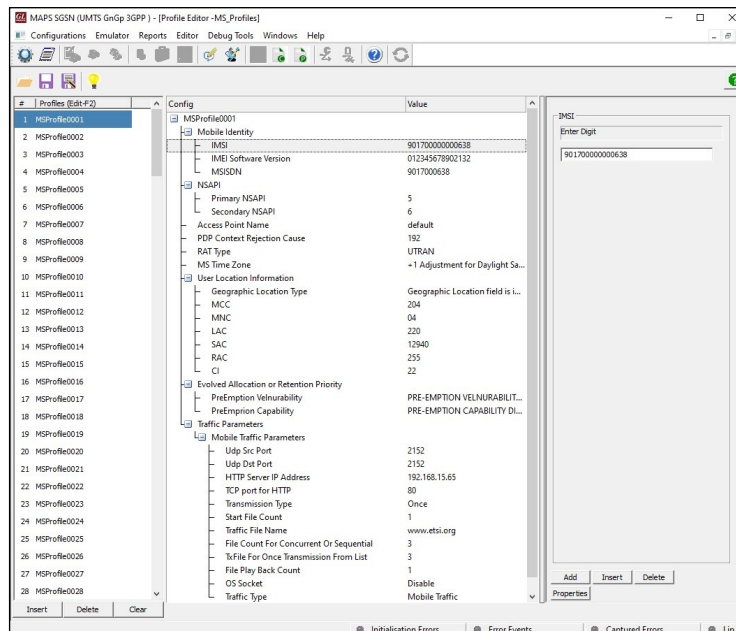

Figure: Profile Editor

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Pre-processing Tools *(Contd.)*

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.
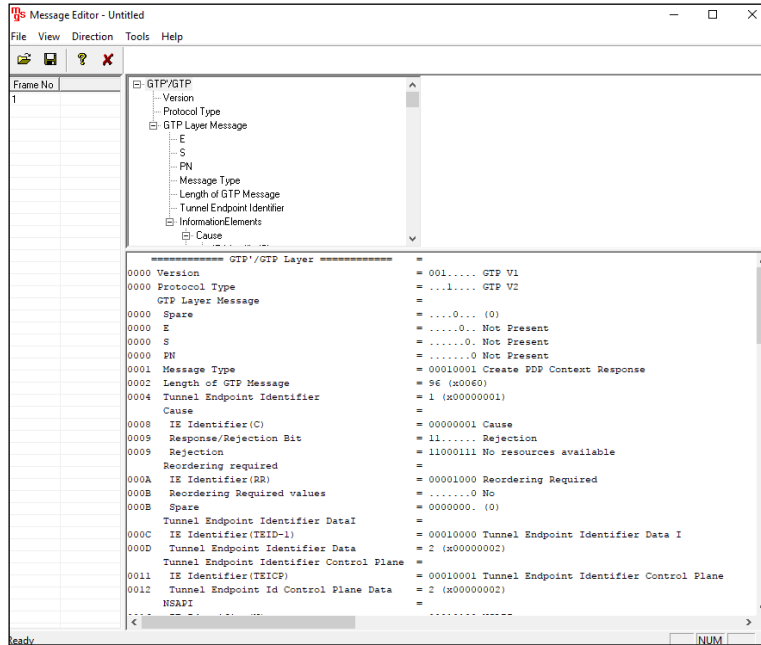

Figure: Message Editor

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.
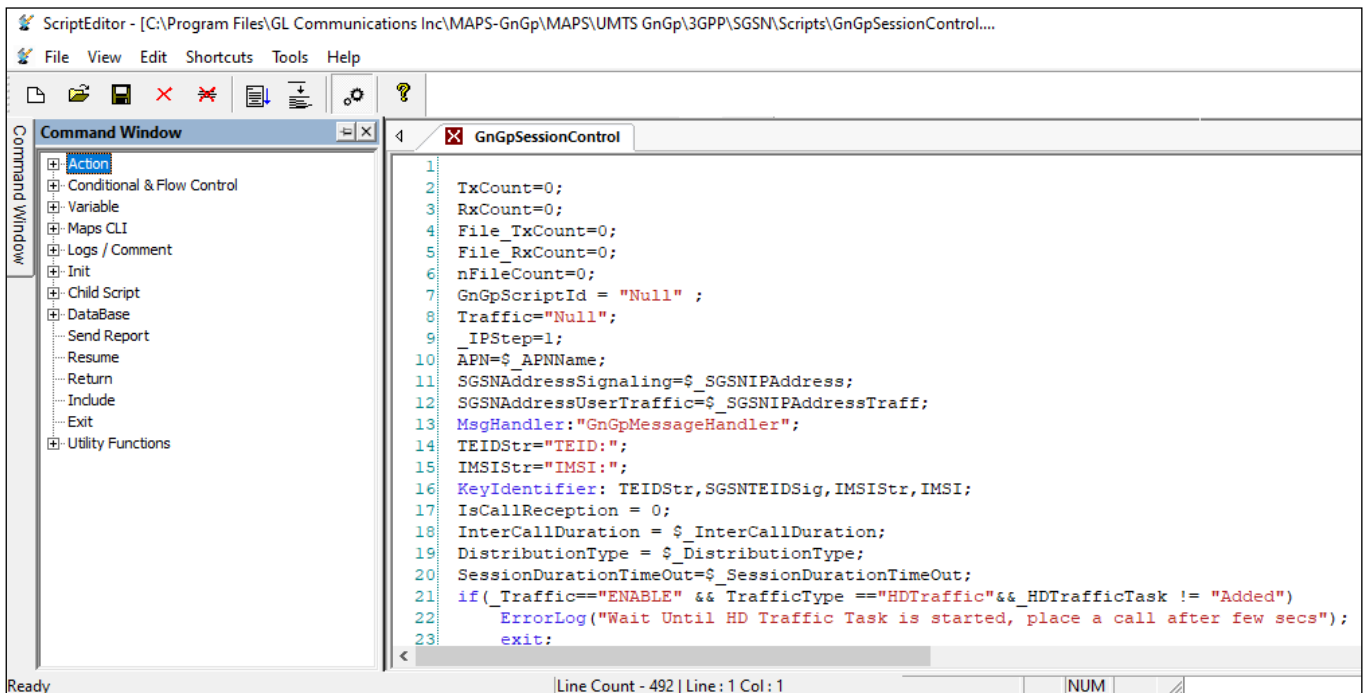

Figure: Script Editor

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Incoming Call Handler Configuration

This option to preset the script required to handle all possible signaling and call processing messages for responding to the call requests in Call Receive part of the MAPS™ GnGp.
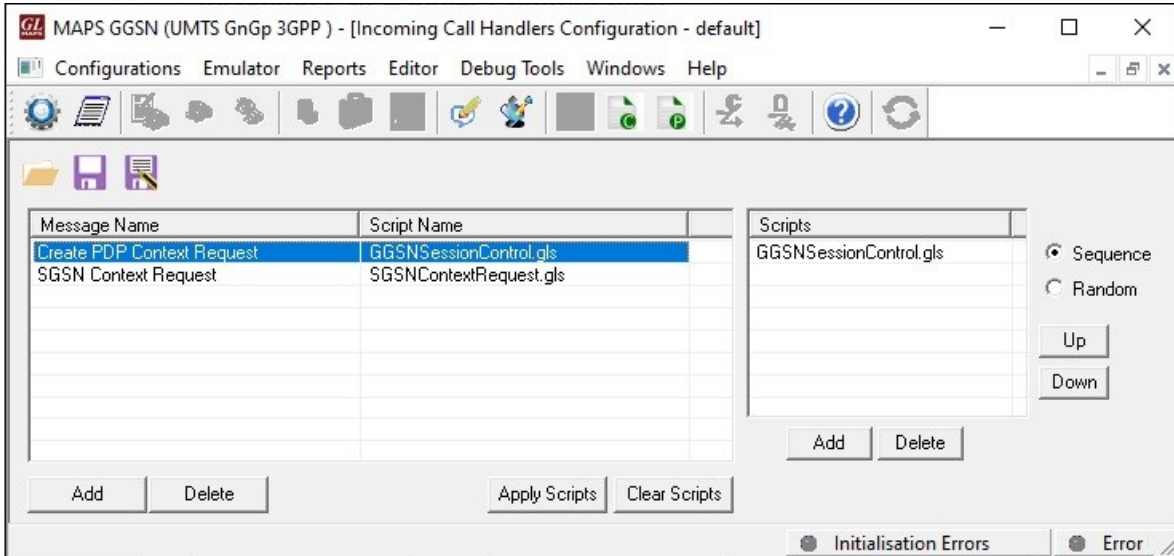

Figure: Incoming Call Handler

Typical GnGp Call Procedure

MAPS™ GnGp can be configured to act as SGSN node and initiate the call flow by sending CreatePDPContextRequest to the DUT (GGSN).

MAPS™ GnGp can also be configured at the network to act as GGSN to receive the incoming CreatePDPContextRequest messages and process the call flow.
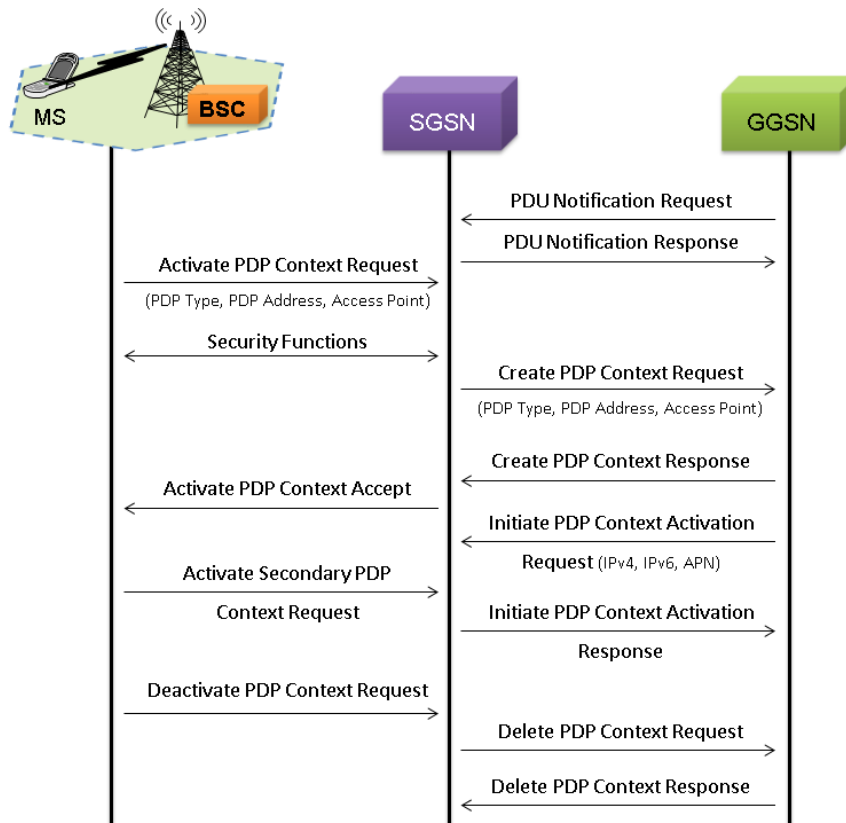

Figure: Typical GnGp Call Procedure

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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 triggered automatically by incoming messages.
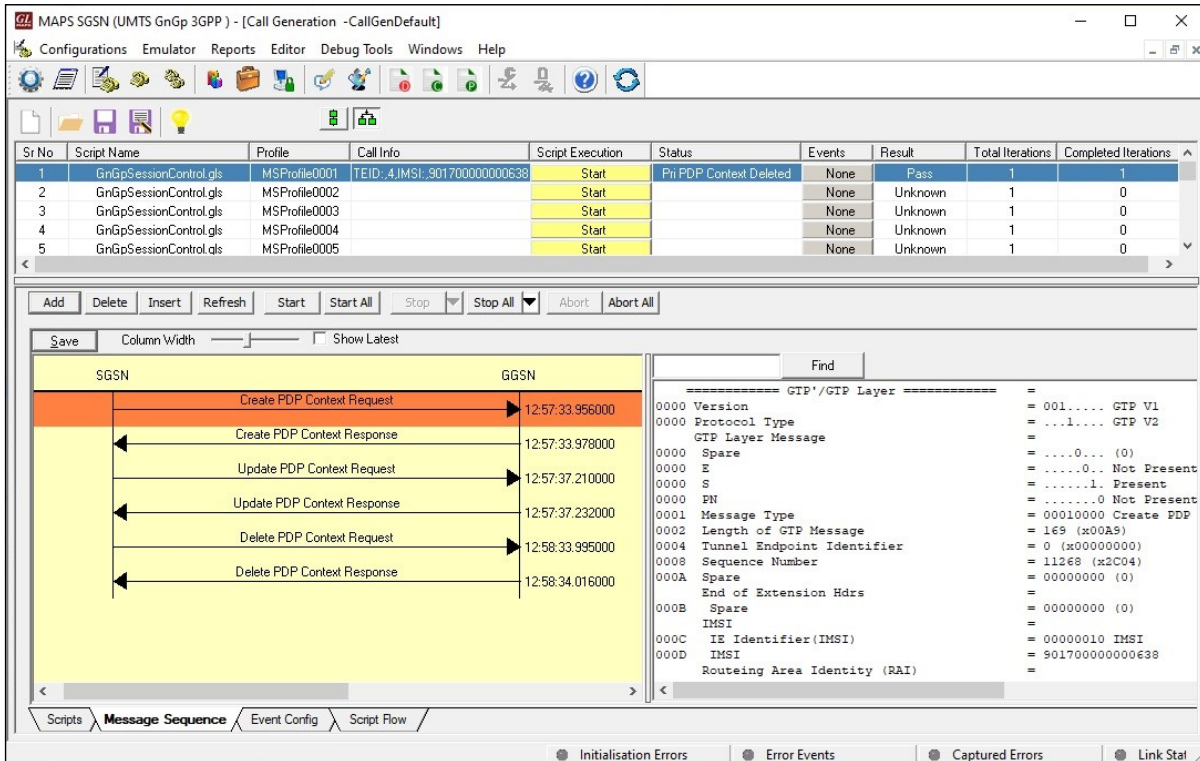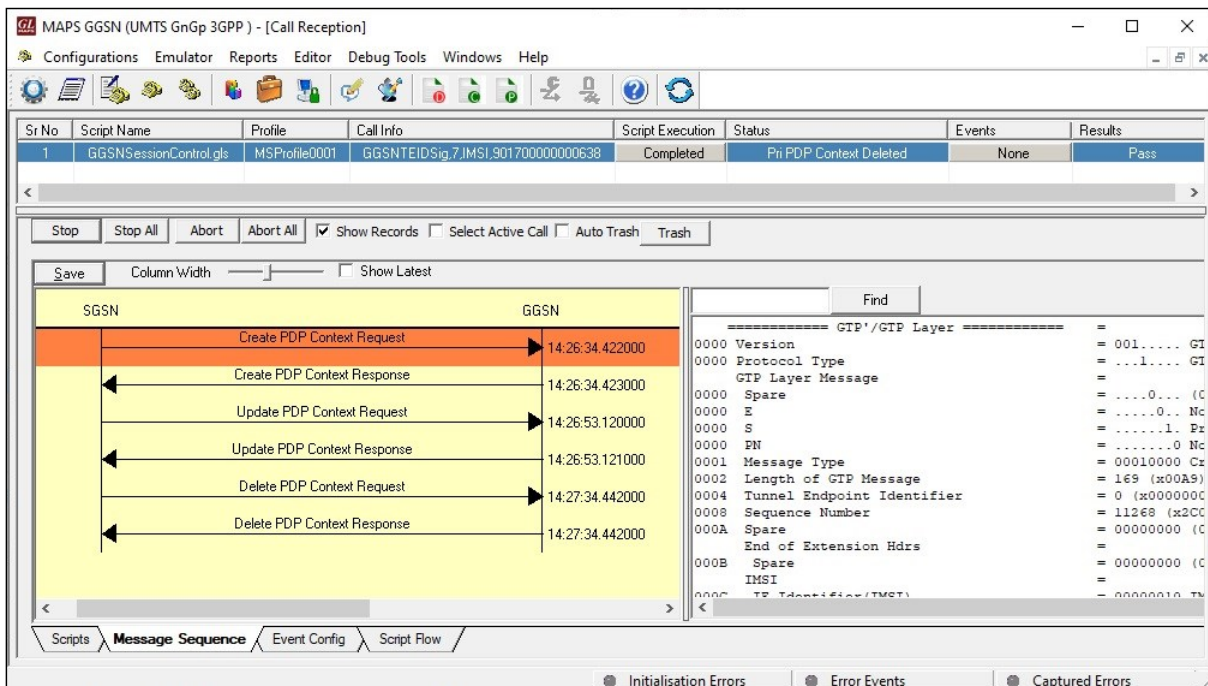

Figure: MAPS™ GnGp Call Generation
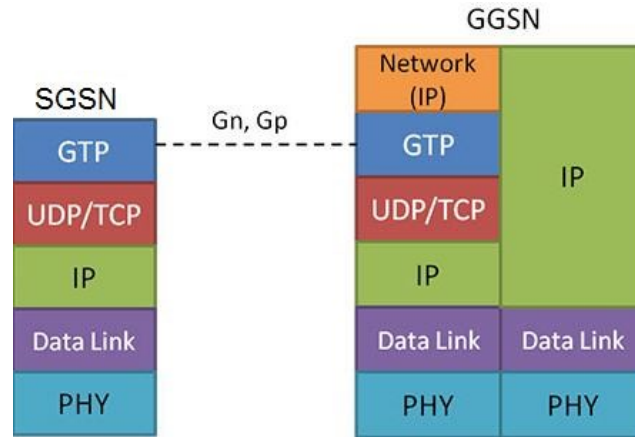

Figure: MAPS™ GnGp Call Reception

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Supported Protocols and Specifications

Supported Protocols	Standard / Specification Used
GTP	TS 29.060 V9.2.0 (2010-03)

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Buyer's Guide

Item No	Product Description
PKS166	MAPS™ UMTS - GnGp Interface Emulation
ETH100	Mobile Traffic - PacketCheck™
ETH101	MobileTrafficCore - GTP
ETH102	MobileTrafficCore - Gateway

Item No	Related Software
XX692	MAPS™-GSM A Interface Emulator
XX648	MAPS™ ISDN Interface Emulator
XX693	MAPS™ GSM A bis Interface Emulator
PKS130	MAPS™ SIGTRAN (SS7 over IP)
PKS140	MAPS™ LTE S1 Interface
PKS142	MAPS™ LTE eGTP (S3, S4, S5, S8, S10, S11 & S16) Interfaces
PKV107	LTE Protocol Analyzer
PKS164	MAPS™ UMTS – IuPS Interface Emulation
PKS160	MAPS™ UMTS – IuCS and Iuh Interface Emulation
PKS137	MAPS™ GSM A Emulation over IP
PKS135	MAPS™ ISDN SIGTRAN (ISDN over IP)
XX100	ISDN Analyzer Software
PKS120	MAPS™ SIP
PKS121	MAPS™ SIP Conformance Test Suite (Test Scripts)
PKS122	MAPS™ MEGACO
PKS123	MAPS™ MEGACO Conformance Test Suite (Test Scripts)
PKS124	MAPS™ MGCP
PKS125	MAPS™ MGCP Conformance Test Suite (Test Scripts)
LTS206	OC-3 / STM-1 UMTS Protocol Analysis
LTS306	OC-12 / STM-4 UMTS Protocol Analysis

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

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