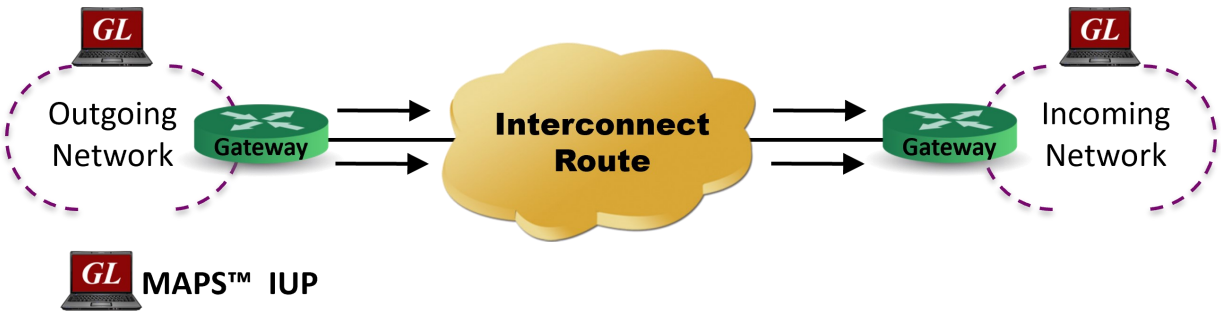
MAPS™ IUP Protocol Simulation

(BRITISH TELECOM INTERCONNECT USER PART - BT IUP)



Overview

GL's Message Automation and Protocol Simulation (MAPS™) for BT IUP protocol is an advanced simulator used to simulate UK specific SS7 IUP in BT networks. It is designed to simulate Incoming and Outgoing Networks via Interconnect route as defined by the PNO-ISC/ INFO/004(IUP) and TGS/SPEC/006 specifications. MAPS™ IUP functionality covers the UK variant of SS7 implementing MTP2, MTP3 protocol standards over TDM (T1/E1) transport layer.

Ready scripts are available supporting various protocol services including Basic (Telephony) Call Service protocol (IFAM, IAM, ACI, Bearer Establishment), Request Service protocol, Nodal End-to-End Data protocol, Enveloped ISUP Essential Service protocol, and ISDN Call Handling Service protocol.

The tester supports testing network elements, error tracking, regression testing, conformance testing, load testing/call generation and generation of high volumes of traffic. It is able to run pre-defined test scenarios against ISUP test objects in a controlled & deterministic manner.

The MAPS™ IUP supports powerful tools like Message Editor, Script Editor and Profile Editor which allow new scenarios to be created or existing scenarios to be modified using ISUP messages and parameters. It gives the flexibility of modifying any message so that we can easily duplicate the messages generated by any node to resolve interoperability issues.

MAPS™ IUP Emulator design also supports TDM traffic such as Voice, Digits, Tones, IVR, FAX, across the SS7 IUP network.

MAPS™ IUP supports client-server functionality through Command Line Interface (CLI) such as the Python, and TCL (Tool Command Language) scripting tools. CLI provides the capability of remote operation, automation, and multi-site connectivity.

GL also provides an independent GUI based SS7 protocol analyzer 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™ IUP Protocol Emulator webpage.

GL Communications Inc.

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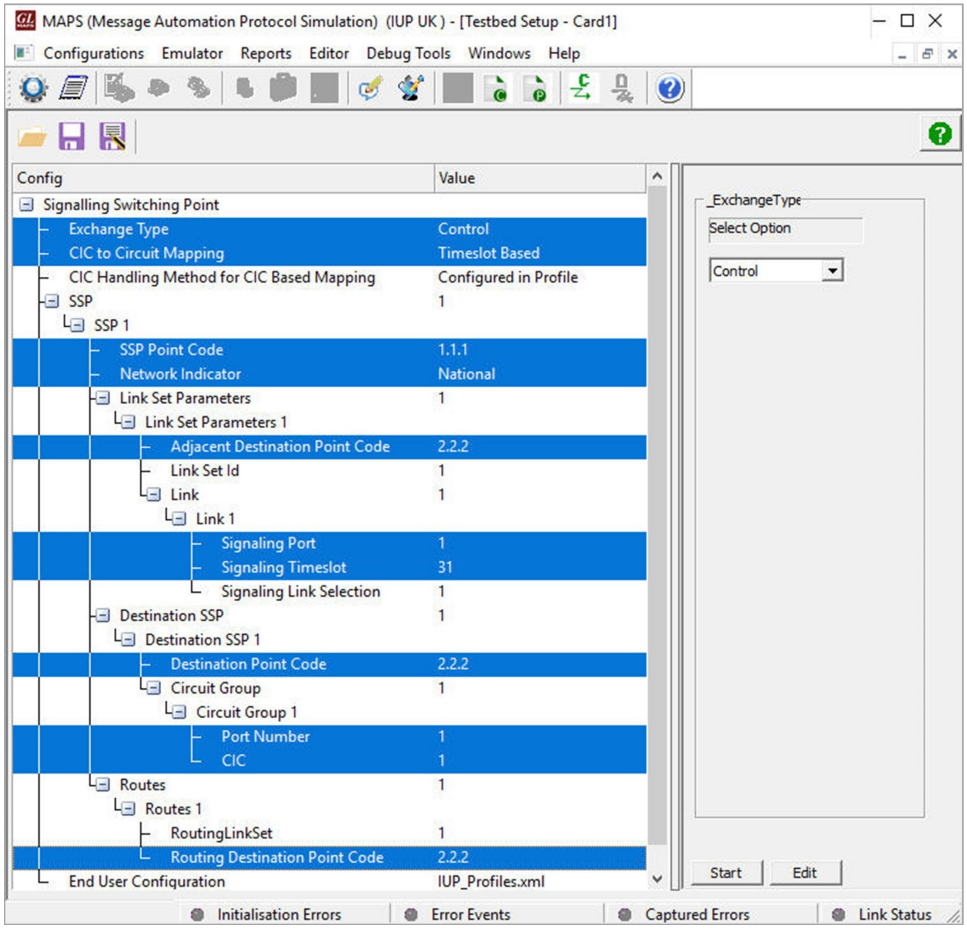
Main Features

- IUP simulation over TDM (T1/E1)
- Multiple T1/E1 line interfaces supported
- Supported procedures include Basic Call Service protocol (IFAM, IAM, ACI, Bearer Establishment), Request Service protocol, Nodal End-to-End Data protocol, Enveloped ISUP Essential Service protocol, and ISDN Call Handling Service protocol.
- Supports generation & detection of TDM traffic - Auto Traffic Voice, Digits, Tones, IVR, FAX, Dynamic VF, and User-defined traffic
- User-friendly GUI for configuring the SS7 MTP Layers
- User-configured Circuit Mapping, i.e., defines Circuit Identification Codes (CIC) and map these CICs to Timeslots/Trunks in order to enable Voice/Data traffic
- Supports MTP2 and MTP3 protocol machine
- Supports client-server functionality through Command Line Interface (CLI) such as the Python, and TCL (requires additional license)
- Provides protocol trace with full message decoding, and graphical ladder diagrams of call flow with time stamp
- Provides call statistics with associated captured events & error events during call simulation
- Deployment of Products with Multiple features and Protocols
- Auto and User Defined TDM traffic
- Provides Fault Insertion and Erroneous Call Flow Testing

Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS™ IUP and the DUT. It includes configuration parameters to be set for point codes, link set ids, Circuit group and other parameter settings. Once the MTP layer is configured properly, IUP messages can be transmitted and received. Default profile is used to configure MAPS™ IUP with end terminal parameters.

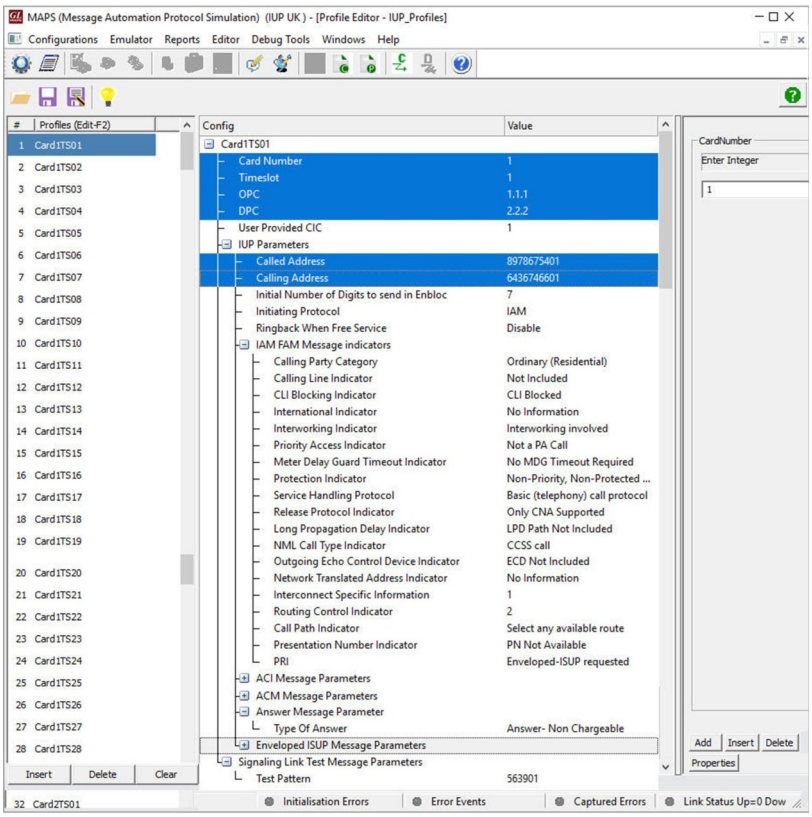


Testbed Setup

Pre-processing Tools

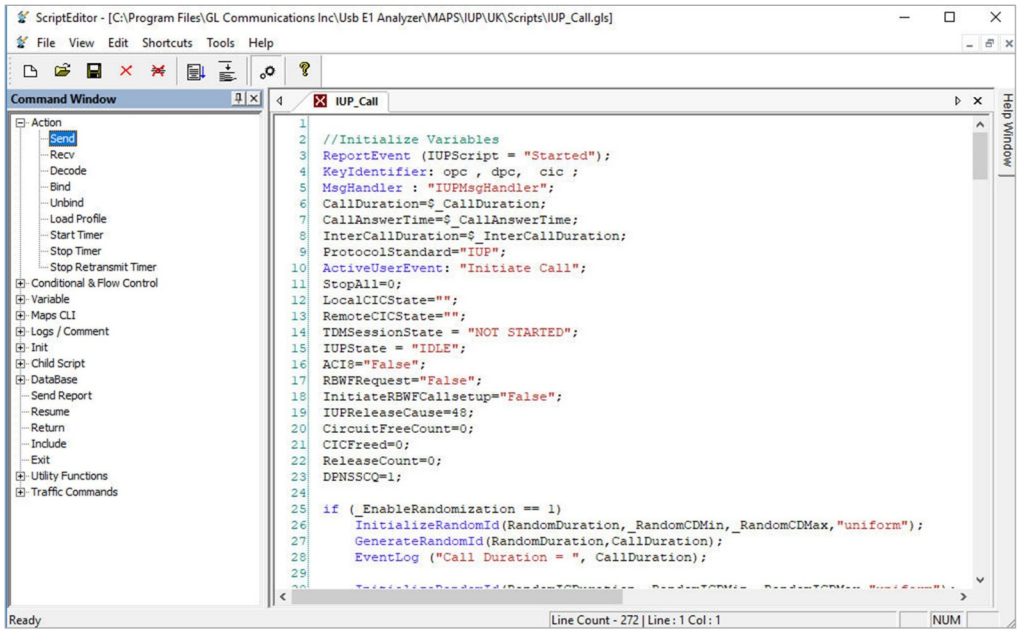
Profile Editor - This feature allows loading profile to edit the values of the variables using GUI, replacing the original value of the variables in the message template.

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. It includes protocol specific 'IUP_Profiles.xml' and traffic specific 'TrafficProfile' configurations.



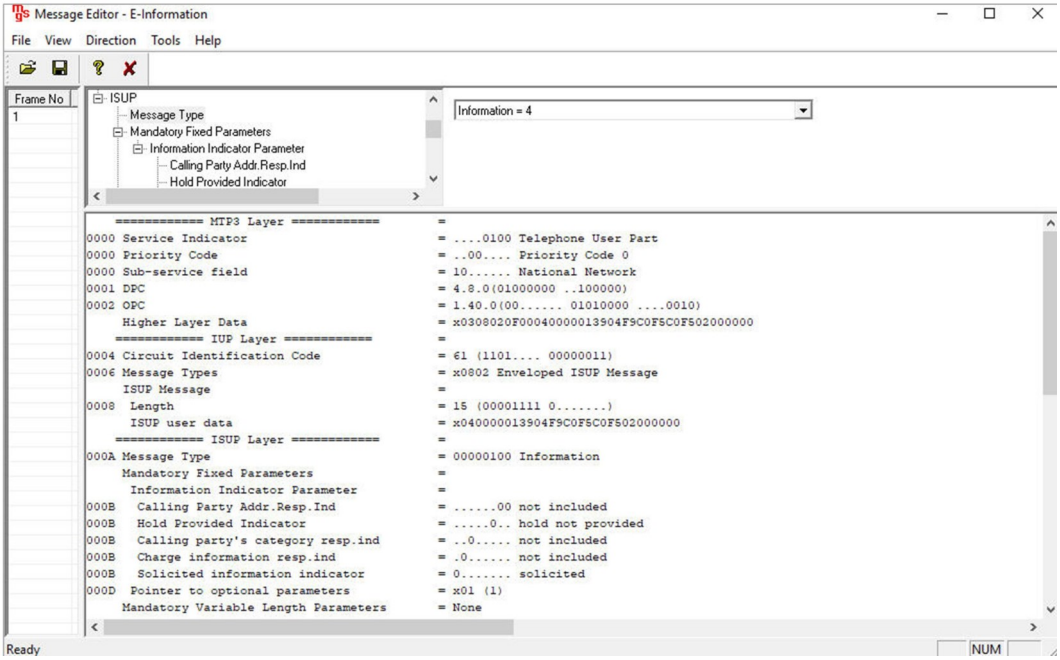
Profile Editor

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.



Script Editor

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.

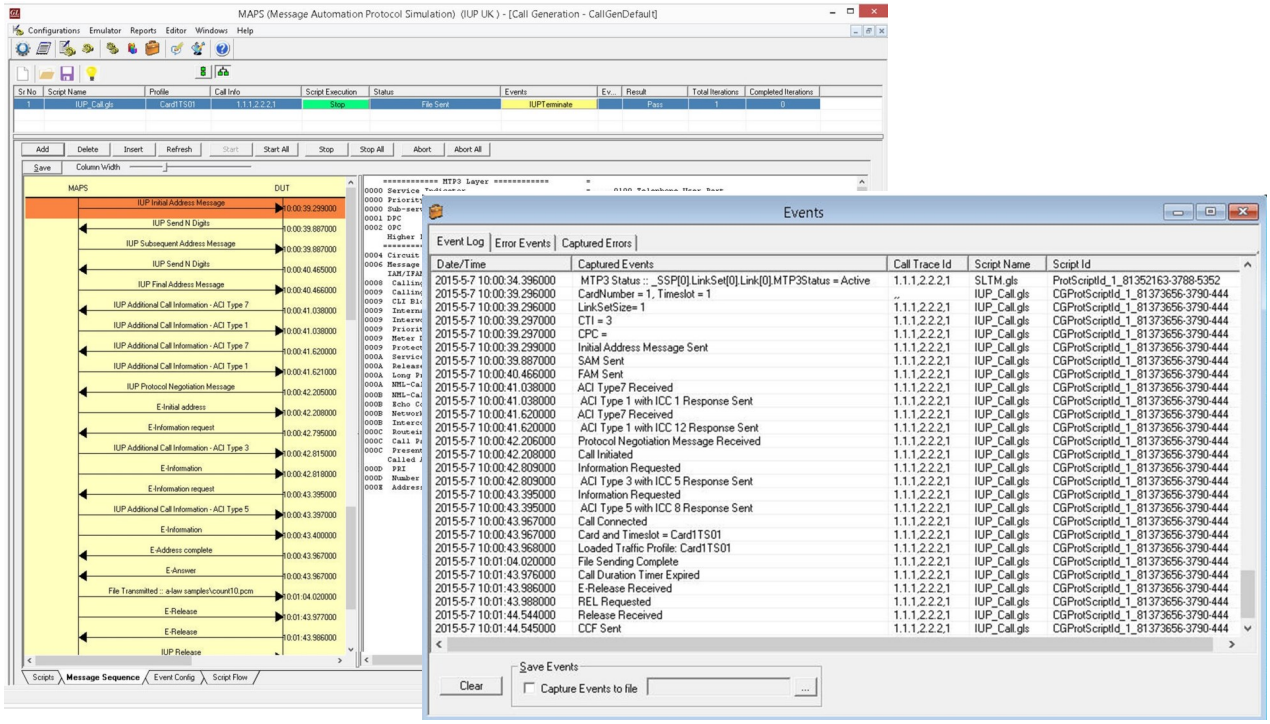


Message Editor

Call Generation and 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.

Once the call simulation is done the user can analyze the captured traffic, error events encountered during the progress of the call from the database through web interface. The below screenshot shows call simulation and events log.

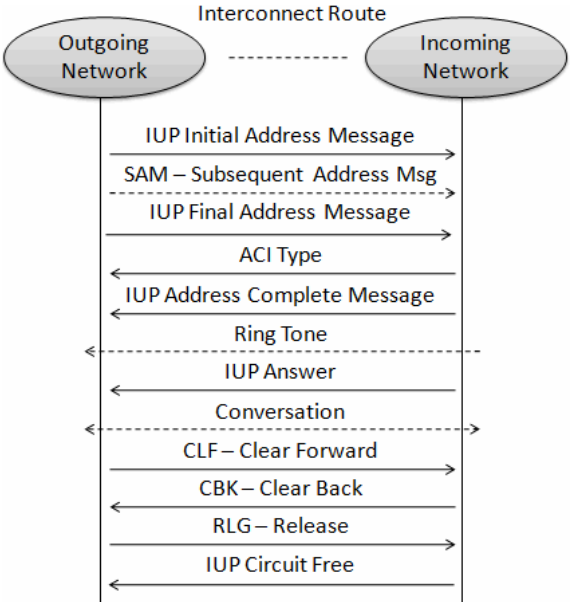


Call Generation and Call Reception

MAPS™ IUP Call Flow Scenario

Basic (telephony) Service Handling Procedure

The IUP basic (Telephony) call procedure is initiated by sending IAM/IFAM message from outgoing network to the incoming network establishing an end to end connection suitable for telephony calls.

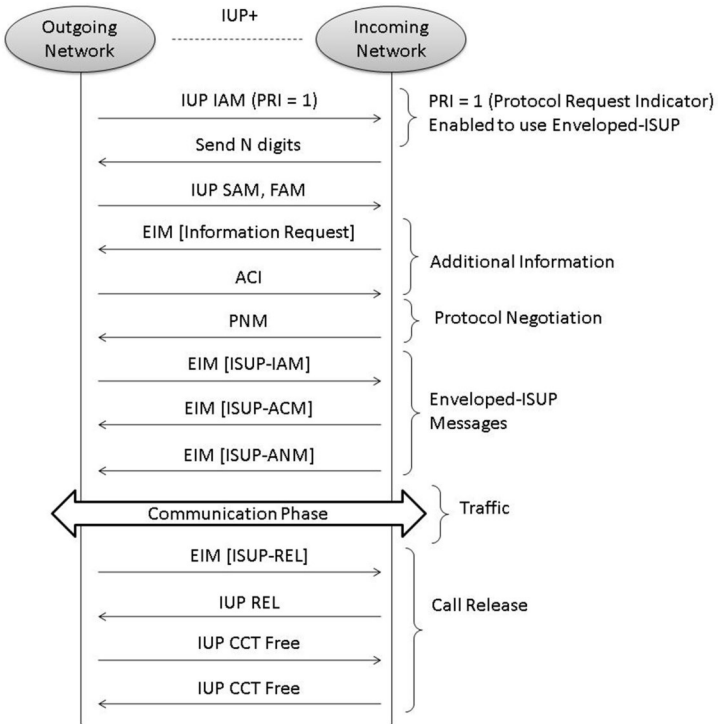


Basic (telephony) Service Handling Procedure

MAPS™ IUP Call Flow Scenario

Enveloped ISUP Call Procedure

The Enveloped ISUP call procedure is initiated at outgoing network to begin EIM procedure by sending IUP with PRI = 1 to the Incoming Network. The protocol negotiation between the two terminals is initiated with IUP PNM message sent by the Incoming Network terminal. The call is proceeded by exchanging IUP messages enveloped within ISUP between the two terminals.

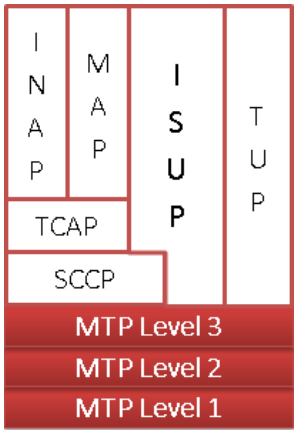


Enveloped ISUP Call Procedure

MAPS™ IUP Supported Procedures

- Bearer establishment
  - IFAM Protocol
  - IAM (SND) Protocol
  - IAM (SAD) Protocol
  - Subsequent Address Message (SAM)
  - Final Address Message (FAM)
- Call Establishment
  - IUP Basic Call Service: (Service Handling Protocol)
  - Request Service protocol (Service Handling Protocol 2)
  - SASUI Protocol (Supplementary Call Information)
  - ACI Protocol (Supplementary Call Information)
  - Nodal End-to-End Data Protocol (Service Handling Protocol 3)
  - ISDN Call Protocol (Service Handling Protocol 1)
  - Enveloped ISUP Essential (Service Handling Protocol 8)
- Call Supervision
  - Connection not completed – SUBSCRIBER ENGAGED or SUBSCRIBER OUT
- Call Release
  - Connection not completed – CNA procedures
  - Connection not completed – RELEASE procedures
  - Bearer Release Protocols

Supported Protocol and Specifications

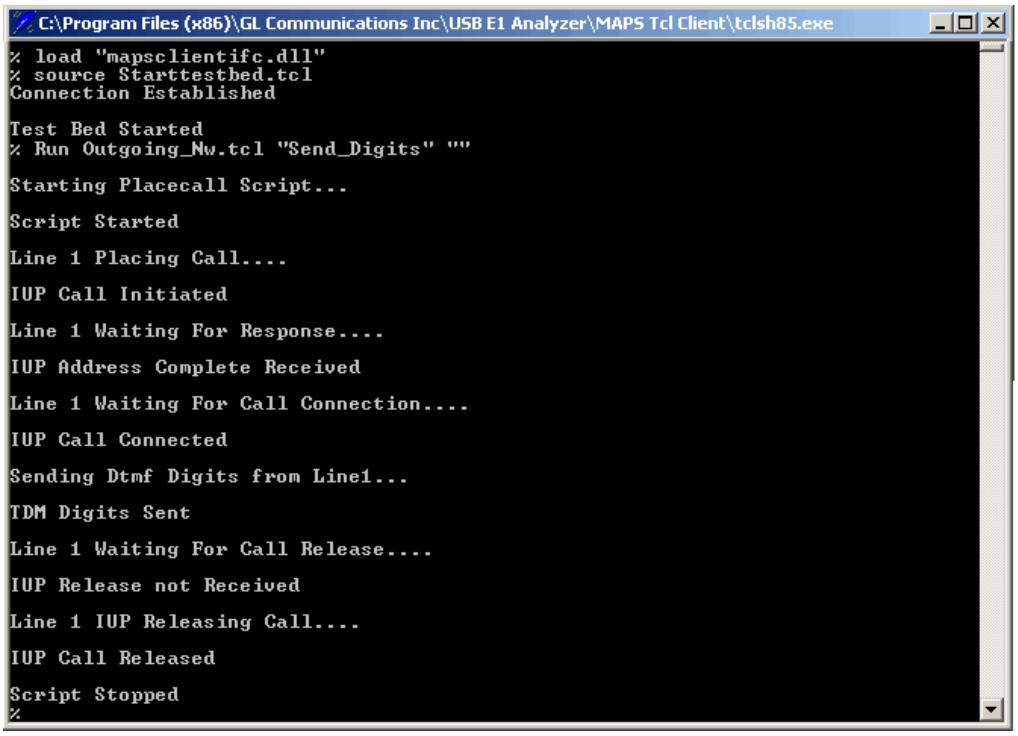


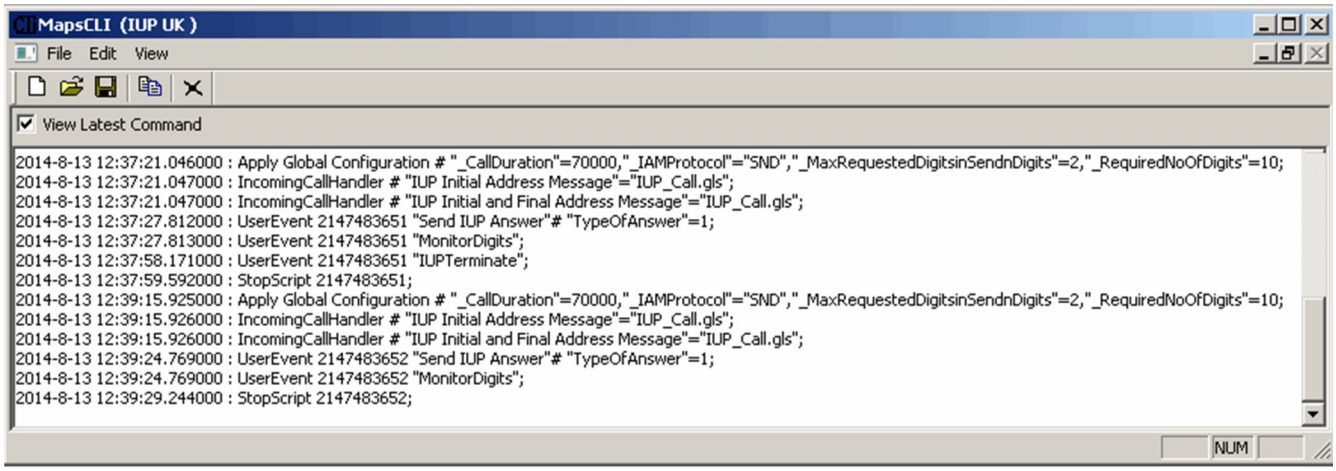
Supported Protocols	Standard / Specification Used
IUP	ND1006:2007/05 TSG/SPEC/006 (IUP) ND1104:2004/11 PNO-ISC/INFO/004 (Proprietary Extensions to IUP) ND1301:2001/03 DPNSS (Digital Private Signaling System No 1 (DPNSS 1)) ISDN User Part (ISUP) UK - ND1007:2001/07 PNO-ISC/SPEC/007
MTP3 (UK)	ITU-T Recommendation Q.703
MTP2 (UK)	T-REC-Q.703-199607

Command Line Interface (CLI)

MAPS™ can be configured as server-side application, to enable remote controlling of the application through multiple command-line based clients. Supported clients include C++, TCL, Python and others.

The TCL "Outgoing_Nw.tcl" script loads the CLI server script "IUP_Call.gls" and the MAPS™ profile "Card1TS01" to remotely perform IUP signaling call generation and reception. MAPS™ CLI Server script can also handle traffic functionalities. Various supported traffic user events are send digits/file/tones, detect digits/file/tones, dial, originate call, terminate call, start and stop traffic and so on.





Buyer's Guide

Item No	Product Description
XX682	MAPS™ IUP Emulator
XX610, XX620	TDM Traffic Options

Item No	Related Software
XX649	MAPS™ SS7 Emulator

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.

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