GL Communications Inc.

Network Protocol Analysis and Emulation

November 2024

- CAS
- HDLC
- ISDN
- SS7 (C7)
- SS1
- MLPPP
- GPRS
- GSM
- UMTS
- SIGTRAN
- LTE (Long Term Evolution)
- TRAU
- Asynchronous Transfer Mode (ATM)
- Frame Relay protocol analyzer
- CDMA 2000
- Protocol Identifier
- Network Surveillance System

GL Communications Inc.

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Supported Hardware Platforms

Dual UTA HD

tProbe™ - Portable USB based T1 E1 VF FXO FXS and Serial Datacom Analyzer

USB based T3 E3 Analyzer

Dual T1 E1 Express (PCIe) Board

Quad / Octal T1 E1 PCIe Card

VQuad™ Probe HD

SonetExpert™ Analyzer

For more details, visit Hardware Platforms webpage.

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CAS Protocol Analysis and Emulation

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CAS Protocol Analyzer (over T1 E1)

GL's **CAS Protocol Analyzer** supports real-time monitoring and decoding of CAS signaling events over T1 or E1 networks. Supported standards include MFCR2 and R1 protocols. The Real-time CAS Analyzer requires GL's T1 or E1 internal cards or portable USB based T1 or E1 external units, and corresponding software licenses. Users can capture and analyze frames in real-time and record all or filtered traffic into a trace file. The recorded trace file can then be analyzed offline and exported to ASCII file, or printed. For more information, visit CAS Protocol Analysis webpage.

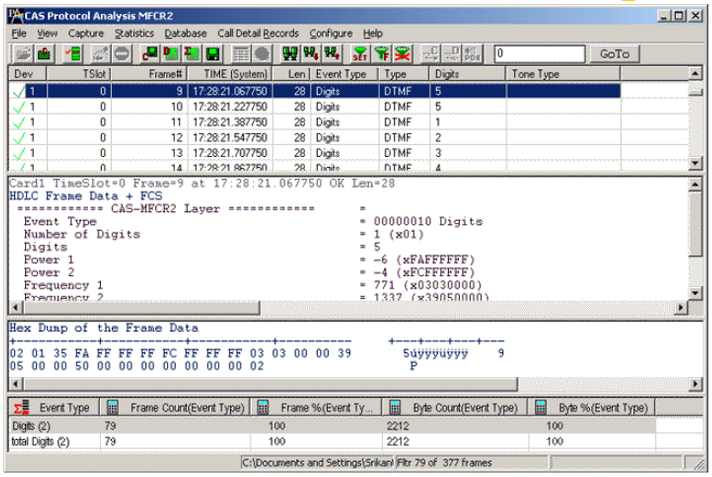

Figure: CAS Analyzer (XX092)

CAS Emulator (over T1 E1)

GL's **CAS Emulator** is a client-side application that works along with the GL's T1/E1 Analyzer cards and Windows Client/Server software. CAS Emulator simulates and analyzes any user-defined CAS protocols by providing signaling bit transitions and forward/backward frequency digits and tones. For more information, visit CAS Protocol Simulation webpage.

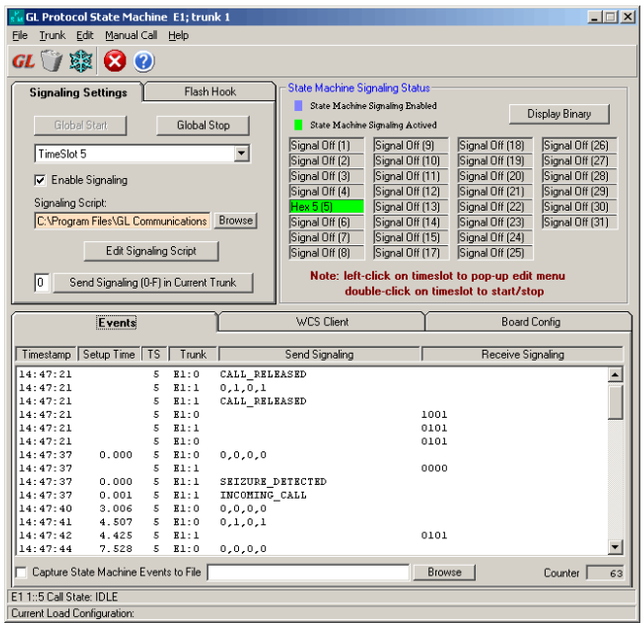

Figure: CAS Simulator (XX625)

MAPS™ CAS Emulator (over T1 E1)

MAPS™ CAS Emulator software automates the CAS signaling testing procedure with ready scripts for inbound and outbound calls, and send/receive TDM traffic such as DTMF/MF digits, Tones, Fax, and Voice. For more information, visit MAPS™ CAS Emulator.

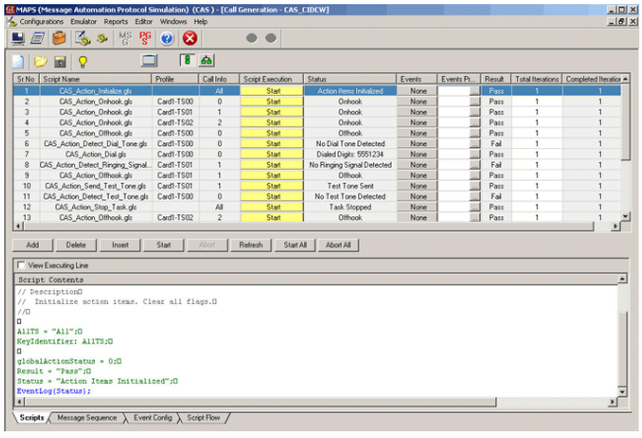

Figure: MAPS™ CAS Emulator (XX651)

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CAS Protocol Analysis and Emulation

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MAPS™ Central Office Switching Simulator

MAPS™ Central Office Switching can be used to verify all Wireless, IP and T1/E1 signaling protocols over different transport networks including IP, ATM, and TDM within the network infrastructure. These protocols include variety of GSM/3G, UMTS/3G, T1/E1 CAS, PRI ISDN, SS7, FXO, FXS, No Call Control, and VoIP protocols (SIP, H.323, MEGACO, MGCP, SIGTRAN). It can also simulate a variety of traffic generation such as, digits, tones, voice file, fax, video file, sms, email, and http depending on the.

For more details, visit MAPS™ Central Office Switching Simulation webpage.

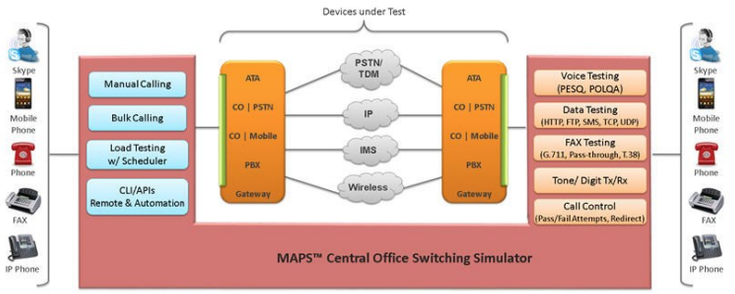

Figure: MAPS™ Central Office Switching Simulation

VQuad™ with CAS/ISDN (over T1 E1)

Using the T1/E1 Analyzer, the VQuad™ can generate and receive up to 12 simultaneous CAS or PRI ISDN or No Call Control (NOCC) calls on T1 or E1 trunks. Once the call is up, sending/recording voice is provided via the VQuad™ traffic configuration yielding in VQT MOS results.

For more information, visit VQuad™ webpage.

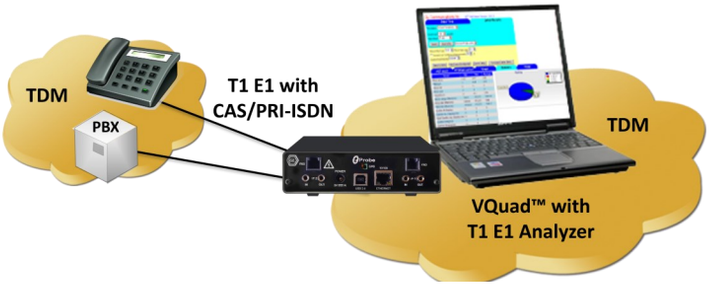

Figure: VQuad™ with CAS Analyzer

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HDLC Protocol Analysis and Emulation

Back

HDLC Protocol Analyzer, Record and Playback (over T1 E1, T3 E3, Datacom)

GL's **HDLC Protocol Analysis and Playback** software provides the capability to capture, analyze, record, and transmit HDLC data on a T1/E1, T3/E3, or Datacom lines. The HDLC frames may be contained in single channel (64 or 56kbps), hyper channels (N*64 or N*56kps), or sub channels (n*8kbps). The analyzer is also available as Remote and Offline HDLC analyzer. The HDLC Automated Test System also consists of **Transmitter – Receiver** applications. The Transmitter application generates HDLC test frames, transmits them, or records them to an HDL file for subsequent use with other applications. The Receiver application can receive frames real-time, or can verify an off-line HDL file for correct frame order and data integrity. For more information, visit HDLC Protocol Analyzer webpage.

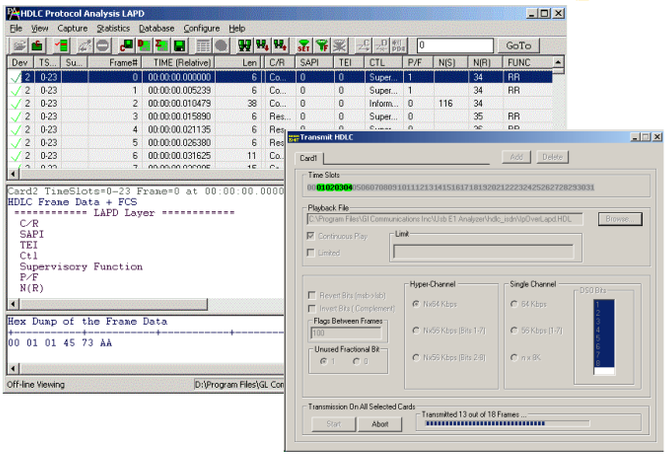

Figure: HDLC Protocol Analyzer, Record and Playback Software (XX090)

HDLC Link Impairment Utility

HDLC Impairment Utility impairs HDLC frames on T1 E1 lines, whether they occur on single timeslots at 64/56 kbps rate or as hyper channels. The application is useful in simulating real network conditions, measure the delays, and the impact thereof on protocols. For more information, visit HDLC Link Impairment Utility webpage.

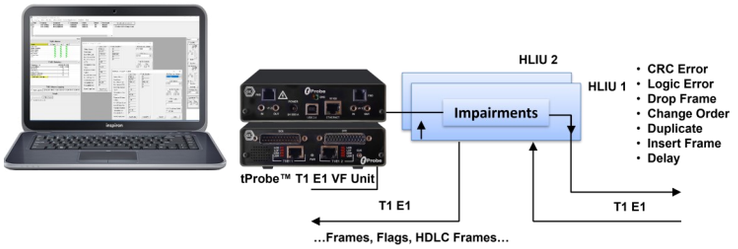

Figure: HDLC Link Impairment Utility (XX090)

Client-Server HDLC Emulation and Analysis

GL provides client –server based HDLC capture, playback, emulation and analysis modules. The File based HDLC Record/ Playback (**Hdlcfunc**) module allows HDLC Traffic Capture/ Playback. It also allows transmission/reception of *.HDL frames files located on the server and on client. The **HDLCTerr** module performs multi-channel HDLC emulation and analysis. The **HDLCHpio** module performs file–based HDLC record and playback actions. It permits receive / transmit of HDLC streams of various bandwidth (hyper channel, timeslot, and multiple sub-channel streams per timeslot). For more information, visit HDLC Emulation and Analysis webpage.

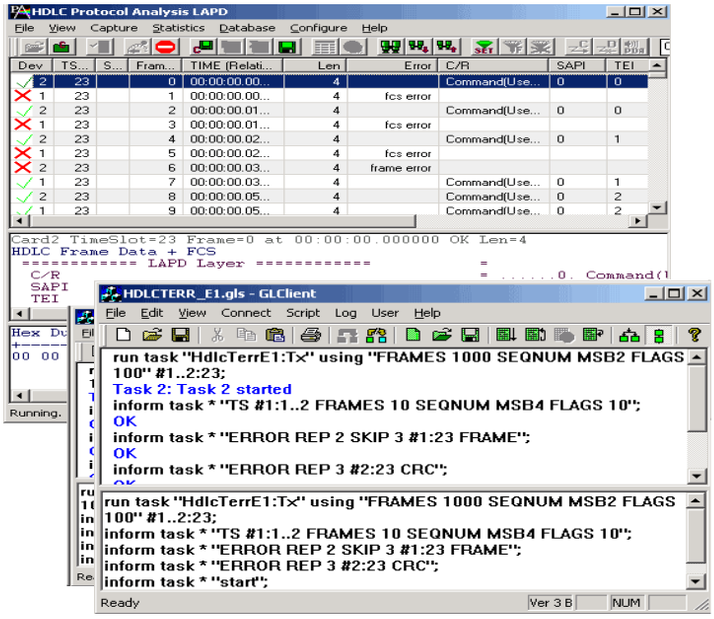

Figure: Multi Channel HDLC Emulation and Analysis (XX634, XX640, XX641)

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ISDN Protocol Analysis and Emulation

Back

ISDN Protocol Analyzer (over T1 E1)

GL's **ISDN Protocol Analyzer** can capture and analyze stream of frames on an ISDN PRI link. It decodes LAPD according to Q.921, while, the ISDN information parsing is done based on the user's selection of protocol standards. The analyzer is also available as Remote and Offline ISDN analyzer.

For more information, visit ISDN Protocol Analyzer webpage.

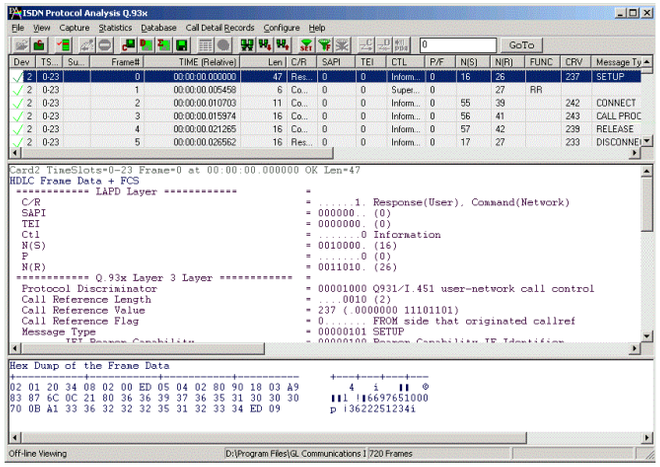

Figure: ISDN Analysis and Emulation Software (XX100)

ISDN SIGTRAN Protocol Analyzer (over IP)

GL's PacketScan™ - All IP Protocol Analyzer supports monitoring all **5G**, **4G, 3G**, and **2G** wireless communication protocols such as GSM, GPRS, UMTS, ISDN and SS7 SIGTRAN, LTE, and Diameter, in addition to IP protocols such as SIP, MGCP, MEGACO, Skinny, and H.323.

PacketScan™ cellular protocol analyzers support analyzing signaling across multiple technologies (Mobile, IMS, LTE, SIGTRAN, VoIP, etc.). Monitor calls progressing through advanced 3G or 4G networks from a central location, along with the powerful and customizable reporting tools.

SIGTRAN Analysis over IP by PacketScan™ permits decoding and analysis of SCTP, and user adaptation (UA) layers such as M2UA, M3UA, M2PA, SUA, IUA, ISUP and GSM MAP. It is used for testing and verification of Signaling Gateways.

For more details, visit ISDN SIGTRAN Protocol Analyzer over IP.

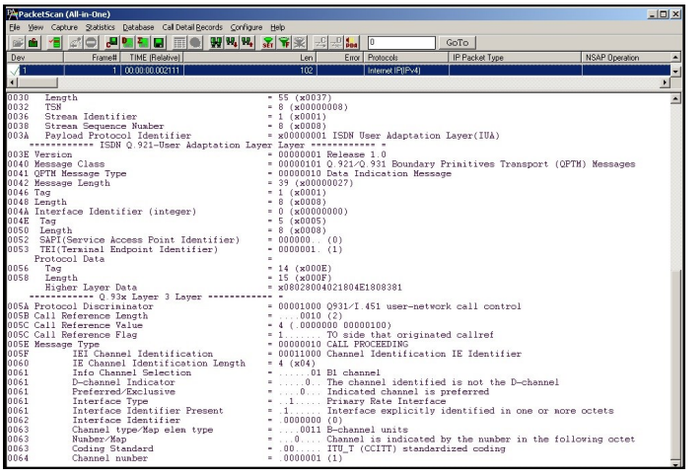

Figure: PacketScan™ ISDN Protocol Analyzer Software (PKV100 and PKV105)

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ISDN Protocol Analysis and Emulation (*Contd.*)

Back

ISDN Protocol Emulator (over T1 E1)

GL's ISDN Emulator provides a user-friendly graphical user interface (GUI), which allows the user to get up and running quickly. From 1 to 4 T1 or E1 trunks can be supported with a mixture of subscriber or switch emulation on different trunks.

For more information, visit ISDN Emulator webpage.

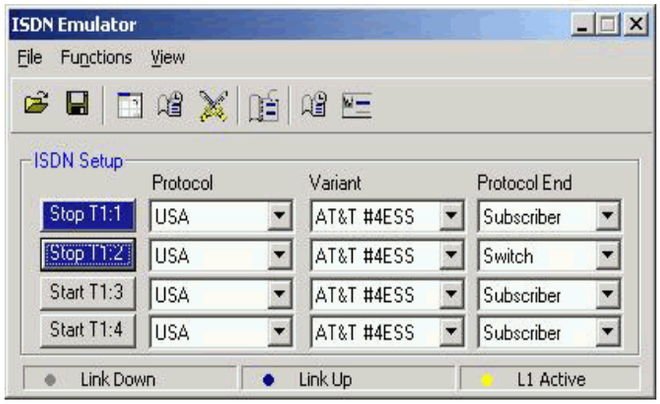

Figure: ISDN Protocol Emulator (XX105)

MAPS™ ISDN Protocol Emulator (over T1 E1)

GL's MAPS™ ISDN Emulator is an advanced protocol emulator/ tester for ISDN simulation over TDM (T1 E1) and generates high volumes of ISDN traffic.

For more information, visit MAPS™ ISDN Emulator webpage.

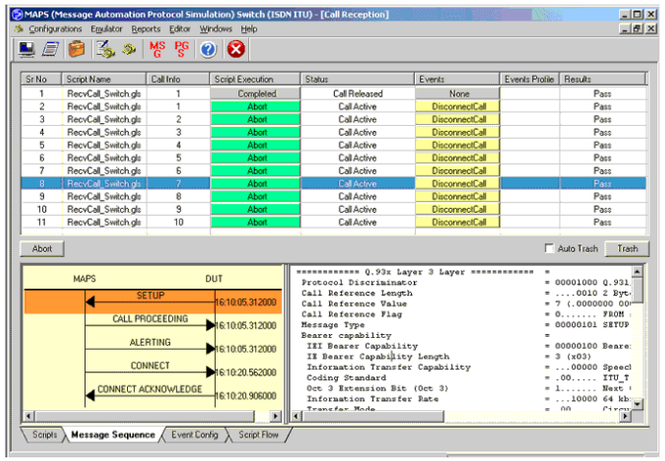

Figure: MAPS™ ISDN (XX648)

MAPS™ ISDN SIGTRAN Protocol Emulator (over IP)

GL's MAPS™ ISDN SIGTRAN Emulator is designed for ISDN emulation over IP. The tester can simulate a complete ISDN connection SG to MGC, where ISDN signaling is defined by the ITU-T Q.921 / Q.931 standards.

For more information, visit MAPS™ ISDN SIGTRAN Emulator webpage.

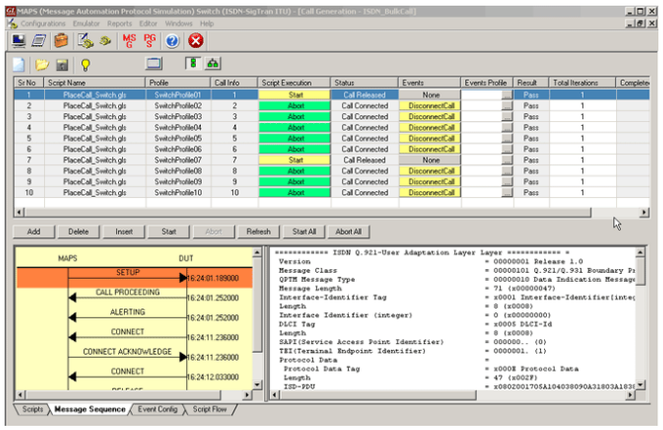

Figure: MAPS™ ISDN SIGTRAN Emulator (PKS135)

GL Communications Inc.

SS7 Protocol Analysis and Emulation

Back

SS7 Protocol Analyzer (over T1 E1)

GL's **SS7 Protocol Analyzer** supports decoding different SS7 layers and many application layer protocols from GSM/GPRS/ UMTS network like MAP, CAMEL (CAP), and so on. The SS7 Analyzer supports decoding of both Low Speed Links (LSL) of 56 kbps or 64 kbps DS0 links or high-speed 1.544 Mbps or 2 Mbps channelized T1 or E1 High Speed Signaling Links (HSL). The analyzer is also available as Remote and Offline SS7 analyzer. For more details, visit SS7 Protocol Analyzer webpage.

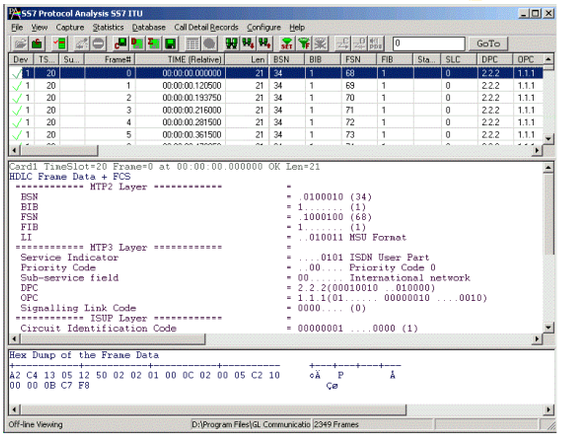

Figure: SS7 Protocol Analysis (XX120)

ISDN SIGTRAN Protocol Analyzer (over IP)

GL's PacketScan™ - All IP Protocol Analyzer supports monitoring all **5G**, **4G**, **3G**, and **2G** wireless communication protocols such as GSM, GPRS, UMTS, ISDN and SS7 SIGTRAN, LTE, and Diameter, in addition to IP protocols such as SIP, MGCP, MEGACO, Skinny, and H.323.

PacketScan™ cellular protocol analyzers support analyzing signaling across multiple technologies (Mobile, IMS, LTE, SIGTRAN, VoIP, etc.). Monitor calls progressing through advanced 3G or 4G networks from a central location, along with the powerful and customizable reporting tools

SIGTRAN Analysis over IP by PacketScan™ permits decoding and analysis of SCTP, and user adaptation (UA) layers such as M2UA, M3UA, M2PA, SUA, IUA, ISUP and GSM MAP. It is used for testing and verification of Signaling Gateways.

For more details, visit SS7 SIGTRAN Protocol Analyzer over IP webpage.

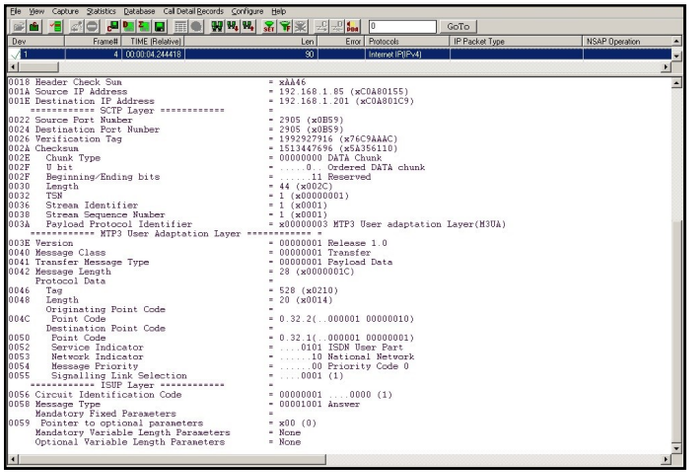

Figure: PacketScan™ SS7 Protocol Analyzer Software (PKV100 and PKV105)

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SS7 Protocol Analysis and Emulation (*Contd.*)

Back

MAPS™ SS7 Protocol Emulator

The **MAPS™ SS7 Emulator** is designed tester for ISUP simulation over TDM (T1 or E1). MAPS™ SS7 can simulate Service Switching Point (SSP). The ISUP signaling specification conforms to ITU-T and ANSI standards. For more details, visit MAPS™ ISUP Protocol Emulator webpage.

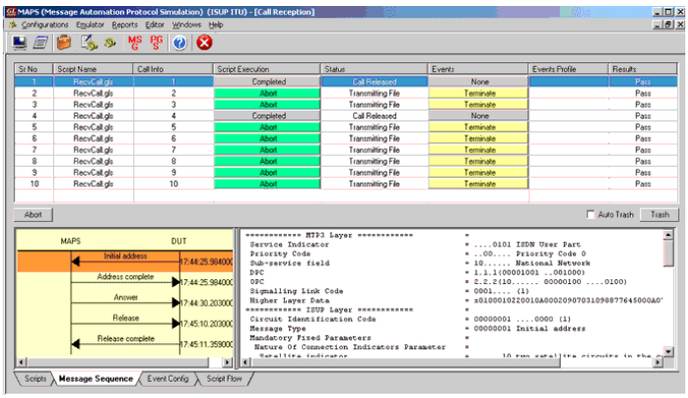

Figure: MAPS™ SS7 Emulator (XX649)

MAPS™ SIGTRAN Protocol Emulator

MAPS™ SIGTRAN Emulator is designed for SS7 simulation over IP Networks. It can emulate a Signaling Gateway and Softswitch ISUP signaling specification as defined by ITU-T standards. For more details, visit MAPS™ SIGTRAN Protocol Emulator webpage.

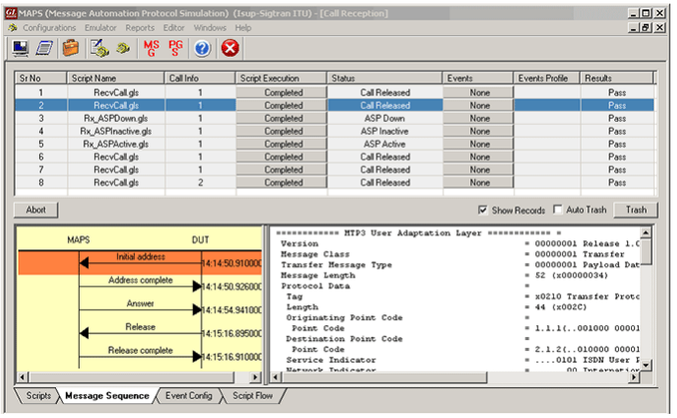

Figure: MAPS™ SIGTRAN Emulator (PKS130)

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SS1 Protocol Analysis and Emulation (*Contd.*)

Back

SS1 Protocol Analyzer (over T1 E1)

The GL's **SS1 protocol analyzer** detects and analyzes tone sequences that make up SS1 dial digits. Sequences of pulse and guard tones are detected, decoded, and assembled into their corresponding dial digits. For more details, visit SS1 Protocol Analyzer webpage.

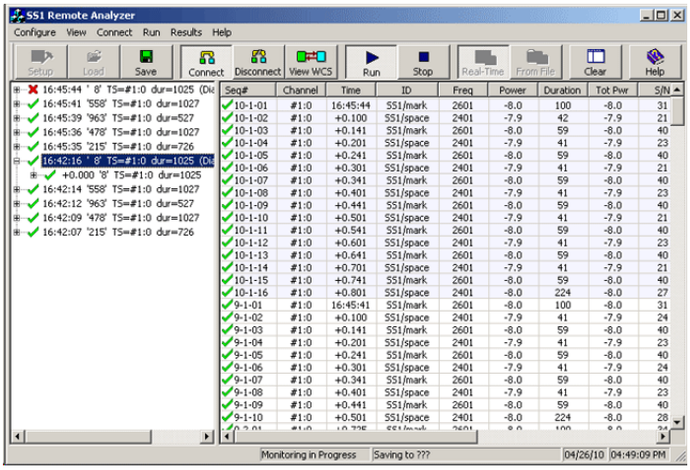

Figure: SS1 Analyzer Software (XX626)

SS1 Emulator (over T1 E1)

The SS1 Emulator (Dialer) application provides the ability to setup and dial tone sequences that make up SS1 dial digits. The applications' interface includes options to setup Dial Code, and control Mask (pulse) and Space (guard) frequencies and duration, Initial, Nominal, and Final Durations, Timeout definitions, Transmit Channel, and other similar parameters related to the dial code. For more details, visit SS1 Emulator over T1 E1 webpage.

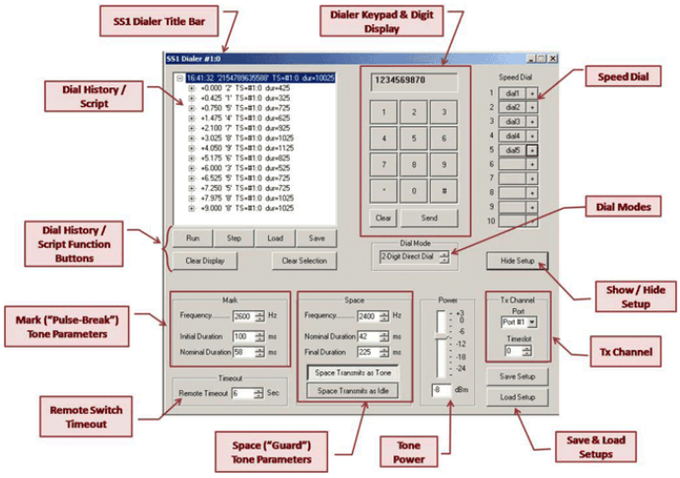

Figure: SS1 Emulation Software (XX626)

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MLPPP Protocol Analysis and Emulation

Back

MLPPP and PPP Protocol Analyzer (over T1 E1, T3 E3, OC3 OC12, Datacom)

The **MLPPP Protocol Analyzer** can be used to capture and decode a host of PPP, MLPPP, and MC-MLPPP protocols exchanged between pairs of nodes over T1 E1, T3 E3, or OC3 OC12 links. MLPPP analyzer also supports **Packet Data Analysis** module (requires additional license) to perform detail analysis of packets over IP and segregates them into SIP / H.323 / MEGCO / MGCP / T.38 Fax calls. The analyzer is also available as Remote and Offline MLPPP analyzer. For more details, visit PPP Analyzer webpage.

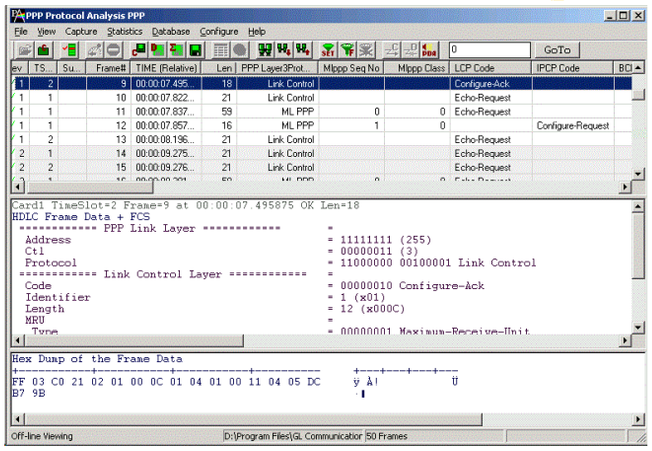

Figure: MLPPP and PPP Protocol Analyzer (XX135)

MC-MLPPP Emulator (over T1 E1)

GL's flexible and versatile MC-MLPPP Emulator is GUI based WCS client, which simulates MC-MLPPP and PPP protocols over T1 or E1 links. The unit is capable of generating and receiving MC-MLPPP/PPP traffic (with or without impairments). For more details, visit Mc-MLPPP Emulator over T1 E1 webpage.

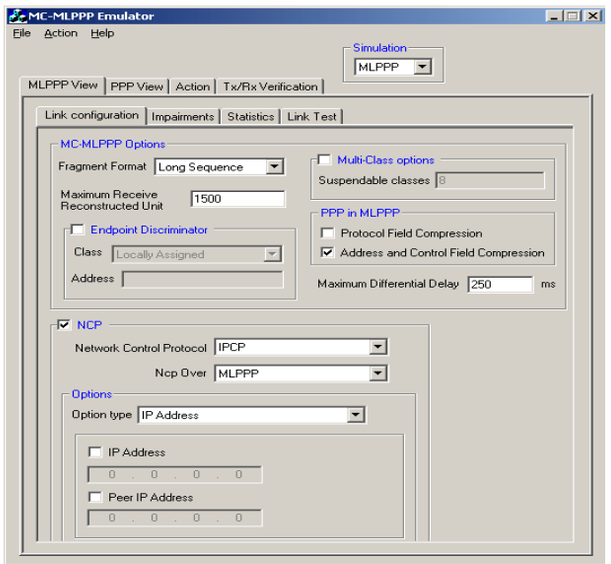

Figure: MC MLPPP Emulator (XX634)

MAPS™ MC-MLPPP Conformance Tester (over T1 E1)

GL's **MAPS™ MC-MLPPP** is an advanced protocol emulator/ tester for MC-MLPPP/MLPPP/PPP protocols over TDM (T1 E1). The tester can simulate a complete PPP/MLPPP link between two peers (Router or a Switch), with MLPPP signaling conforming to IETF specifications. For more details, visit MAPS Mc-MLPPP Conformance Tester.

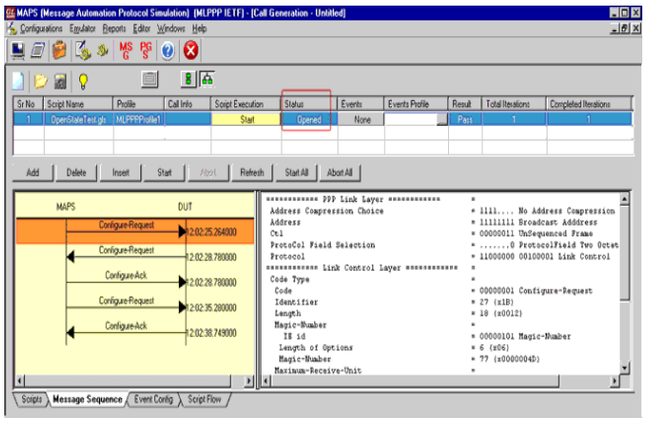

Figure: MAPS™ MC MLPPP Emulator (XX652)

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GPRS Protocol Analysis and Emulation

Back

GPRS Protocol Analyzer (over T1/E1)

The **GPRS Protocol Analyzer** when connected between SGSN and BSS elements of a GPRS network permits the monitoring of Gb interface. Similarly, when connected between SGSN and GGSN elements, permits monitoring of the Gn interface. The analyzer is also available as Remote and Offline GPRS analyzer.

For more details, visit GPRS Protocol Analyzer webpage.

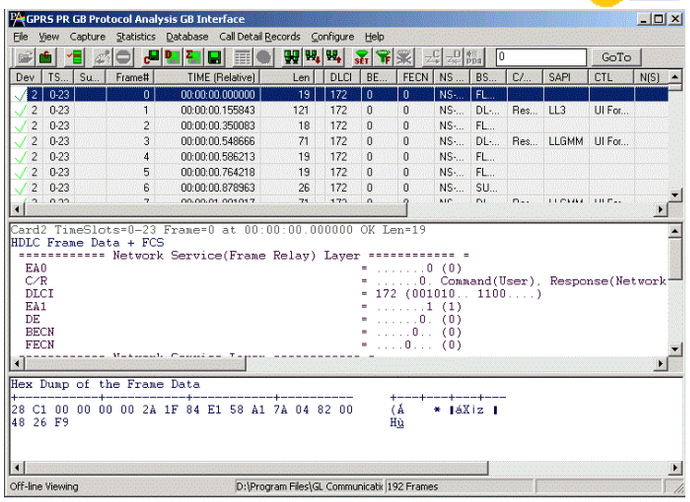

Figure: GPRS Protocol Analyzer Software (XX155)

GPRS Protocol Analyzer (over IP)

GL's PacketScan™ - All IP Protocol Analyzer supports monitoring all **4G**, **3G, 2G**, and wireless communication protocols such as GSM, GPRS, UMTS, SIGTRAN, LTE, and Diameter, in addition to IP protocols such as SIP, MGCP, MEGACO, Skinny, and H.323.

PacketScan™ cellular protocol analyzers support analyzing signaling across multiple technologies (Mobile, IMS, LTE, SIGTRAN, VoIP, etc.). Monitor calls progressing through advanced 3G or 4G networks from a central location, along with the powerful and customizable reporting tools

GPRS Analysis over IP by PacketScan™ permits decoding and analysis of signaling and user data protocols over Gb and Ga/ Gn interfaces.

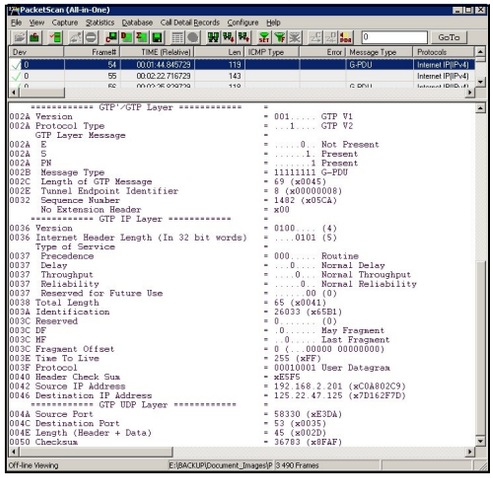

Figure: PacketScan™ GPRS Protocol Analyzer Software (PKV100 and PKV103)

MAPS™ GPRS Gb Emulator (over IP)

MAPS™ GPRS Gb Emulator is designed to simulate GPRS Gb interface between the BSS and the SGSN over IP transmission protocol. MAPS™ GPRS Gb Emulator supports various procedures including Network Service Control, Identity Check, Combined GPRS / IMSI Attach, and Routing Area Update. It can run pre-defined test scenarios against the interface test objects in a controlled and deterministic manner. For more details, visit MAPS™ GPRS Gb Emulator webpage.

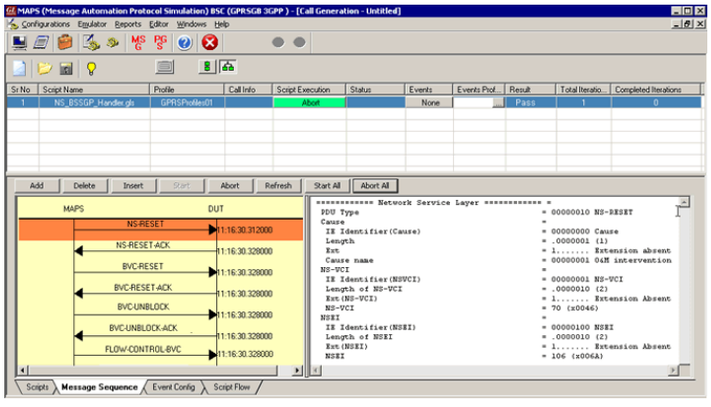

Figure: MAPS™ GPRS Gb Emulator (PKS133)

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GSM Protocol Analysis and Emulation

Back

GSM Protocol Analyzer (over T1 E1)

GL's **GSM Protocol Analyzer** is used to analyze GSM protocols, a switching and signaling telecommunication protocol between MSC & BSC, BSC & BTS, MSC & SMLC, UMA & MS, and so on. GSM protocol analyzer also supports decoding proprietary 'Mobis' Interface (Motorola equivalent of the GSM A-bis interface) between BSC - BTS and BSC - PCU. Other interfaces supported include Ls / Lb / Lp Interface (Interface between MSC and SMLC), and Up (Interface between UNC (UMA network controller) and MS). The analyzer is also available as Remote and Offline GSM analyzer.

For more details, visit GSM Protocol Analyzer webpage.

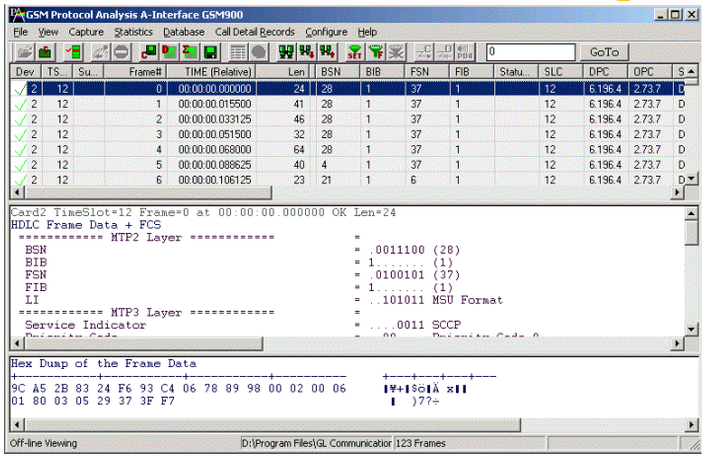

Figure: GSM Protocol Analyzer (XX150)

GSM Protocol Analyzer (over IP)

GL's PacketScan™- All IP Protocol Analyzer supports monitoring all **5G, 4G, 3G**, and **2G wireless communication protocols** such as GSM, GPRS, UMTS, SIGTRAN, LTE, and Diameter, in **addition** to **IP protocols** such as SIP, MGCP, MEGACO, Skinny, and H.323.

PacketScan™ cellular protocol analyzers support analyzing signaling across multiple technologies (Mobile, IMS, LTE, SIGTRAN, VoIP, etc.). Monitor calls progressing through advanced 3G or 4G networks from a central location, along with the powerful and customizable reporting tools.

GSM interfaces supported over IP by **PacketScan™** are:

- A (b/w BSC and MSC)
- A-bis (b/w BSC and BTS)

For more details, visit GSM Protocol Analyzer over IP webpage.

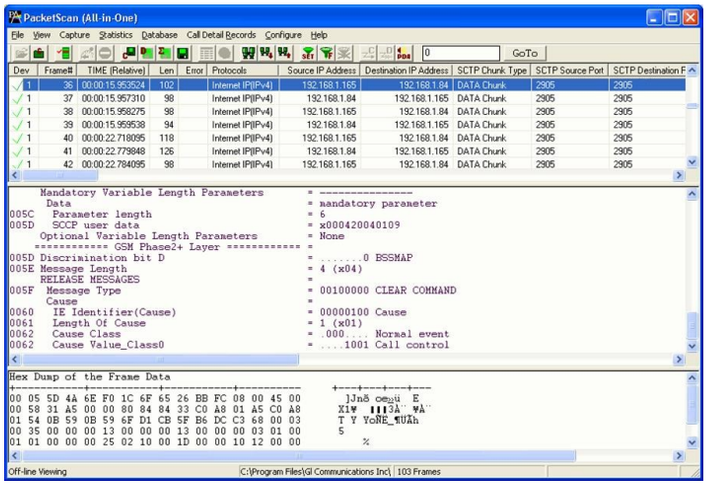

Figure: PacketScan™ GSM Protocol Analyzer (PKV100 and PKV103)

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GSM Protocol Analysis and Emulation (*Contd.*)

Back

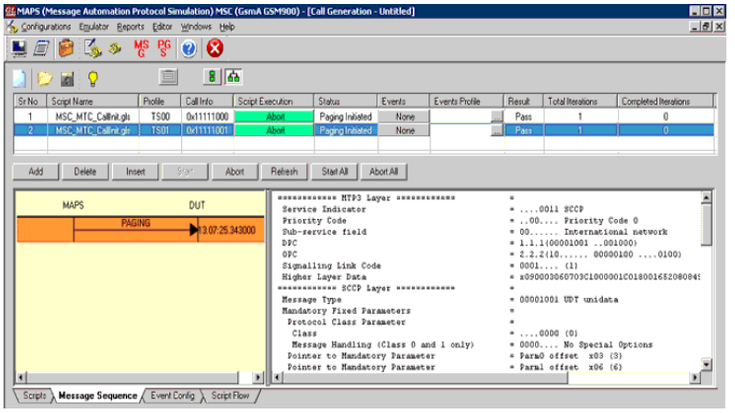
MAPS™ GSM A and Abis Emulator (over T1 E1)

GL's **MAPS™ GSM A Emulator** can emulate A Interface network elements MSC and BSC by generating and receiving BSSMAP and DTAP messages.

For more details, visit MAPS™ GSM A Emulator over T1 E1 webpage

GL's **MAPS™ GSM Abis Emulator** can simulate Abis interface network elements BTS and BSC by generating and receiving BTSM messages. The signaling specification conforms to ITU-T and 3GPP standards.

For more details, visit MAPS™ GSM Abis over T1 E1 webpage.



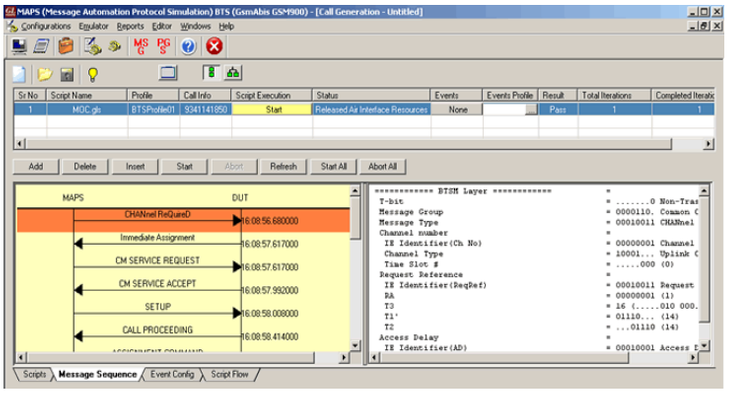


Figure: MAPS™ GSM A (XX692), and MAPS™ GSM Abis (XX693)

MAPS™ GSM A and Abis Emulator (over IP)

GL's **MAPS™ GSM A IP** is designed for emulating BSC (Base Station Controller), and MSC (Mobile Switching Center) entities on GSM A interface over IP. For more details, visit MAPS™ GSM A over IP Emulator webpage.

GL's **MAPS™ GSM Abis IP** can emulate BTS and BSC elements by generating and receiving BTSM messages. The signaling specification conforms to 3GPP standards. The traffic handling capabilities supports RTP traffic.

For more details, visit MAPS™ webpage.

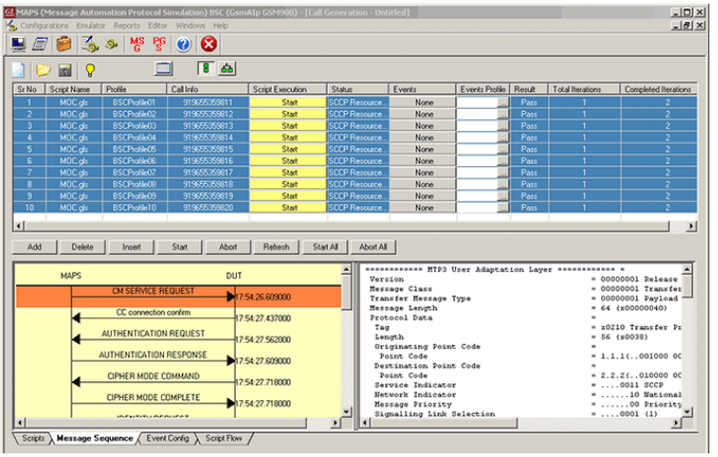


Figure: MAPS™ GSM A IP (PKS137)

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TRAU Protocol Analysis and Emulation

Back

TRAU Protocol Analyzer and Playback (over T1 E1)

GL's **TRAU Protocol Analyzer** is used to non-intrusively monitor TRAU frames at the Abis interface (between the BTS (CCU) and the TRAU node at BSC/MSC). The application can automatically detect and capture TRAU frames of half rate (HR -8 kbps) or full rate (FR-16 kbps). The analyzer also supports **TRAU Packet Data Analysis** which provide detail packet analysis in tabular and graphical formats as well as detailed frame-by-frame information. The analyzer is also available as Remote and Offline TRAU analyzer. For more details, visit TRAU Analyzer webpage. The **TRAU Traffic Playback** provides the ability to playback the recorded TRAU HDL file(s) on selected/all subchannels of T1 or E1 lines. The application allows the user to transmit a single or multiple files on the desired subchannels at any given time. TRAU frames are time-aligned as per the control information in the frame. For more details, visit TRAU Traffic Playback webpage.

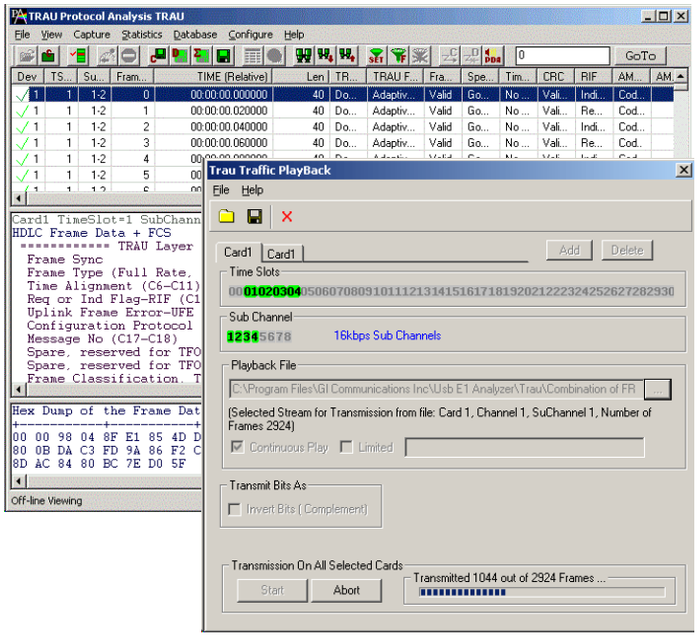

Figure: TRAU Protocol Analyzer and Playback (XX153)

TRAU Toolbox™ Emulator (over T1 E1)

GL's **TRAU Toolbox™** is used to create, monitor, and terminate multiple TRAU/GSM traffic. Once the TRAU session is created, different kinds of audio/voice/digits can be generated and analyzed on GSM call with various codecs. **TRAU Toolbox™** is an ideal tool to test network elements at A-bis and A interface. For more details, visit TRAU Tool webpage.

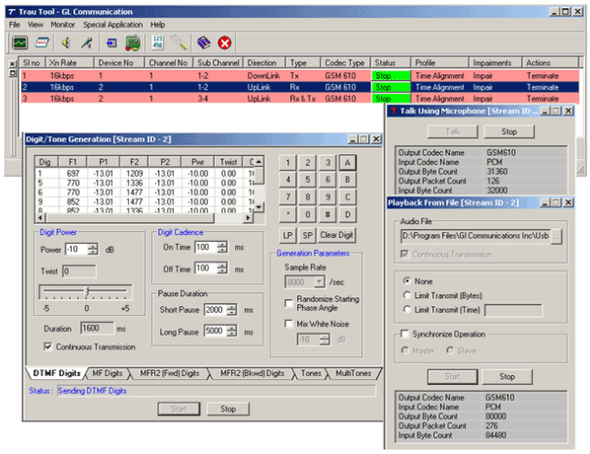

Figure: TRAU Toolbox Emulator (XX153)

MAPS™ GSM Abis Emulator (over T1 E1)

GL's **MAPS™ GSM Abis** can emulate BTS and BSC elements by generating and receiving BTSM messages. The signaling specification conforms to ITU-T and 3GPP standards. The traffic handling capabilities supports TRAU traffic. The TRAU Traffic commands includes Transmit TRAU DTMF Digits (Send TRAU File, Send TRAU Tones), Monitor TRAU Digits, Rx TRAU File, Monitor TRAU Tones, and Stop Traffic Actions.

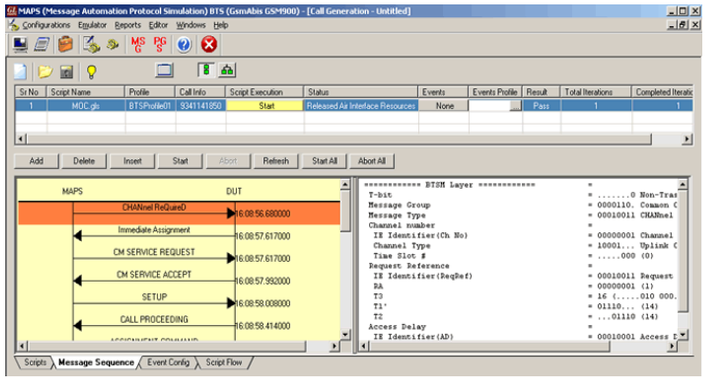

Figure: MAPS™ GSM Abis (XX693)

For more details, visit MAPS™ webpage.

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UMTS Protocol Analysis and Emulation

Back

UMTS Protocol Analyzer (over T1 E1, OC3 OC12)

GL's **UMTS Protocol Analyzer** is capable of capturing, decoding and performing various test measurements across various interfaces i.e. Iub, Iur, IuCS and IuPS interfaces of the UMTS network based on ATM transport layer. The analyzer is also available as Remote and Offline UMTS analyzer. It helps in fault diagnosis and troubleshooting of UMTS network on T1/E1 and OC-3 / OC-12 lines. For more details, visit UMTS analyzer webpage.

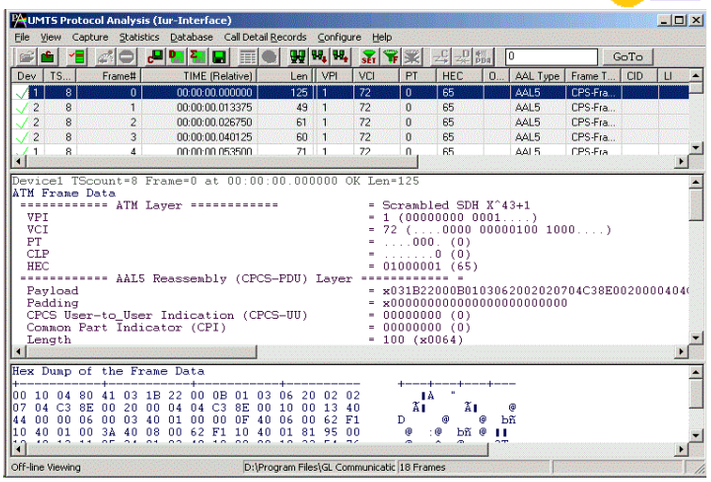

Figure: MAPS™ UMTS Analyzer (XX165, LTS206, LTS306)

UMTS Protocol Analyzer (over IP)

GL's PacketScan™- All IP Protocol Analyzer supports monitoring all **5G, 4G, 3G,** and **2G wireless communication protocols** such as GSM, GPRS, UMTS, SIGTRAN, LTE, and Diameter, in **addition** to **IP protocols** such as SIP, MGCP, MEGACO, Skinny, and H.323.

PacketScan™ cellular protocol analyzers support analyzing signaling across multiple technologies (Mobile, IMS, LTE, SIGTRAN, VoIP, etc.). Monitor calls progressing through advanced 3G or 4G networks from a central location, along with the powerful and customizable reporting tools.

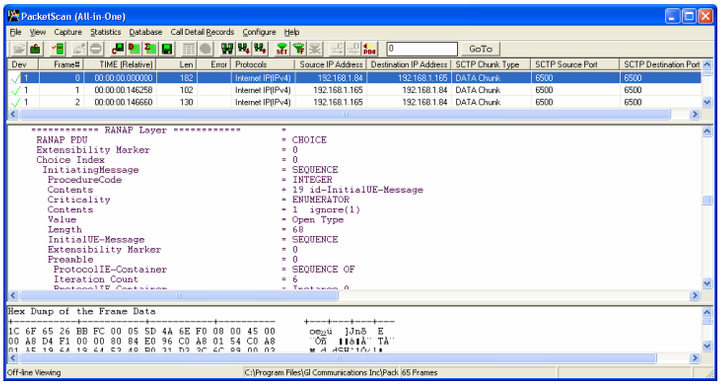

Figure: PacketScan™ UMTS Analyzer (XX165, LTS206, LTS306)

UMTS IuCS and IuPS supported over IP by **PacketScan™** permits -

- Testing RNC, MSC, Home NodeB (HnB) and Home NodeB Gateway (HN GW) entities.
- Decode and analyze different control plane protocols i.e. NBAP, RNSAP, RANAP and more over IuCS, IuH, and IuPS interfaces

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UMTS Protocol Analysis and Emulation (*Contd.*)

Back

MAPS™ UMTS IuPS Emulator (over IP)

MAPS™ UMTS IuPS can emulate IuPS interface with RNC, and 3G SGSN entities by generating RANAP and DTAP signaling messages over IP (SCTP as Transport layer). For more details, visit MAPS™ UMTS IuPS Emulator webpage.

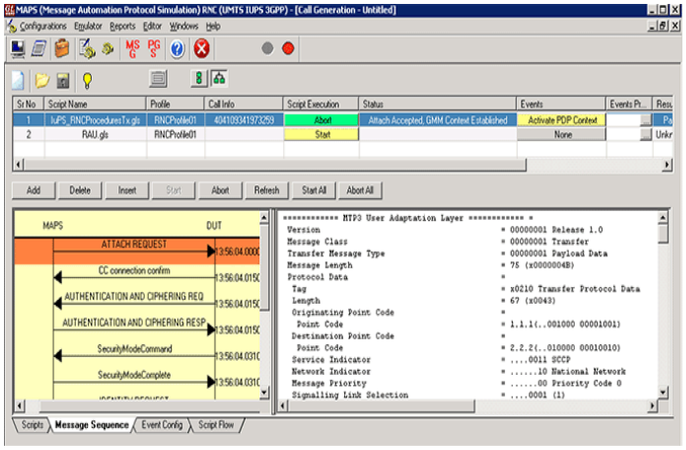

Figure: MAPS™ UMTS IuPS Emulator (PKS164)

MAPS™ UMTS IuCS IuH Emulator (over IP)

MAPS™ UMTS IuCS Emulator can emulate the RNC and the MSC nodes by generating RANAP and DTAP signaling messages over SCTP as Transport layer. **MAPS™ UMTS IuH Emulator** can simulate Femto Home Node B (HnB), and a Femto Home Node Gateway (HnB-GW) by generating RANAP and DTAP signaling messages over SCTP as Transport layer.

For more details, visit MAPS™ UMTS IuCS IuH Emulator webpage.

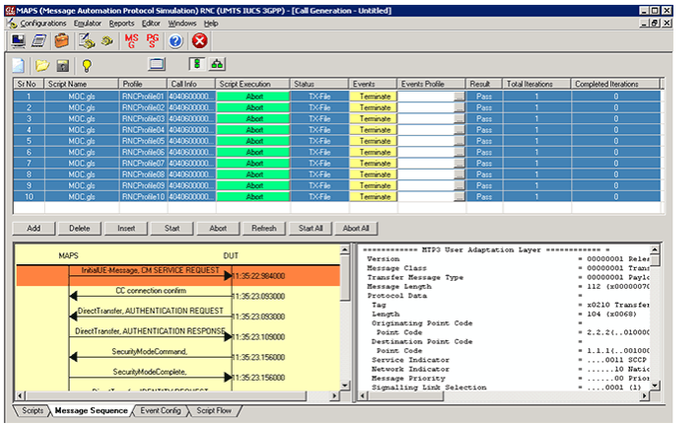

Figure: MAPS™ UMTS IuCS, IuH Emulator (PKS160)

MAPS™ Gn Gp Interface Emulator

GL's **MAPS™ Gn Gp Emulator** can emulate GTP messages over Gn, Gp interfaces with signaling specification as per 3GPP TS 29.060 GPRS Tunneling Protocol (GTP) standard. For more details, visit MAPS™ Gn Gp Emulator webpage.

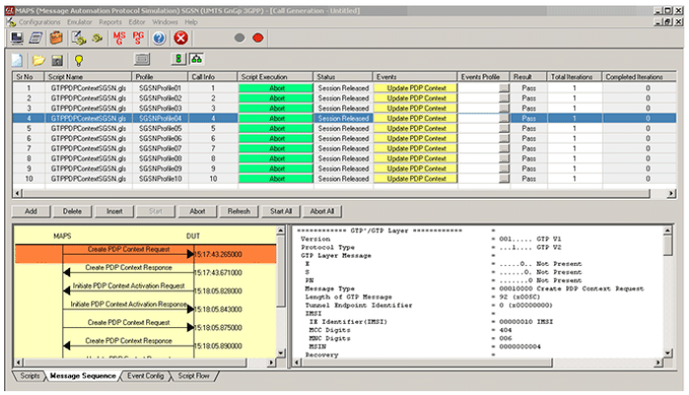

Figure: MAPS™ UMTS Gn Gp Interface Emulator (PKS166)

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SIGTRAN Protocol Analysis and Emulation

Back

SIGTRAN Protocol Analyzer

GL's PacketScan™- All IP Protocol Analyzer supports monitoring all **2G, 3G**, **4G,** and **5G wireless communication protocols** such as GSM, GPRS, UMTS, SIGTRAN, LTE, and Diameter, in **addition** to **IP protocols** such as SIP, MGCP, MEGACO, Skinny, and H.323. The analyzer is also available as Remote and Offline PacketScan™ analyzer.

PacketScan™ cellular protocol analyzers support analyzing signaling across multiple technologies (Mobile, IMS, LTE, SIGTRAN, VoIP, etc.). Monitor calls progressing through advanced 3G or 4G/5G networks from a central location, along with the powerful and customizable reporting tools.

PacketScan™ SIGTRAN analyzer supports SCTP, M2UA, M3UA, M2PA, SUA, IUA, SIGTRAN protocols. For more details, visit PacketScan™ SIGTRAN Analyzer webpage.

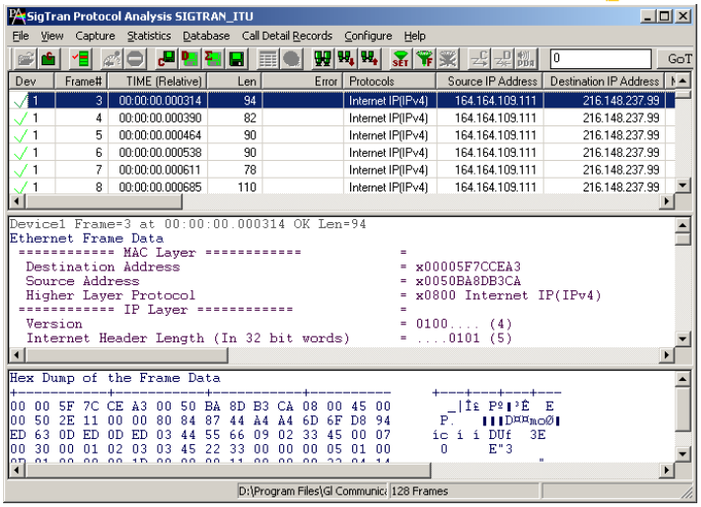

Figure: PacketScan™ SIGTRAN Analyzer (PKV105)

MAPS™ ISDN SIGTRAN Protocol Emulator

MAPS™ ISDN SIGTRAN is a powerful tool that can be used to perform detailed testing of ISDN protocol messages over IP, and offers a complete solution for testing, troubleshooting, and maintenance of devices and networks implementing PRI ISDN. For more details, visit MAPS™ ISDN SIGTRAN Emulator webpage.

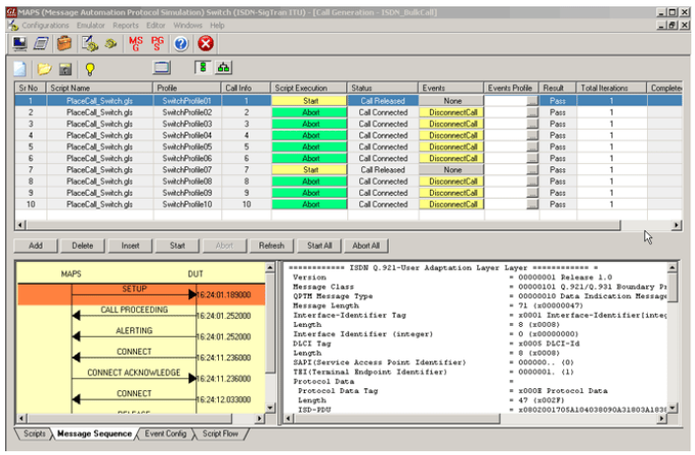

Figure: MAPS™ ISDN SIGTRAN Emulator (PKS135)

MAPS™ SIGTRAN (SS7 IP) Protocol Emulator

GL's **MAPS™ SIGTRAN** is an advanced protocol emulator/ tester for SS7 emulation over IP Networks. It can simulate a Signaling Gateway and Soft switch ISUP signaling specification as defined by ITU-T standards.

For more details, visit MAPS™ SIGTRAN (SS7) Protocol Emulator webpage.

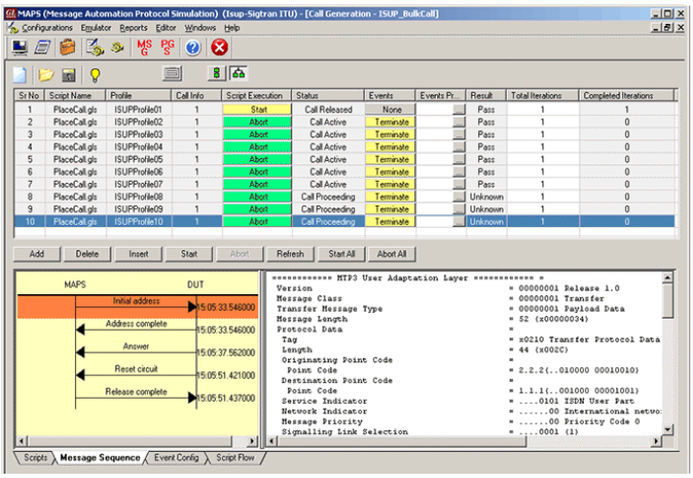

Figure: MAPS™ SS7 SIGTRAN Emulator (PKS130)

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LTE Protocol Analysis and Emulation

Back

LTE Protocol Analyzer

GL's **LTE Protocol Analyzer** is capable of capturing, decoding and performing various test measurements across various interfaces i.e. S1, S3, S4, S5 (or S8), S6a, S10, S11, S13 and X2 interfaces of the LTE network. The analyzer is also available as Remote and Offline LTE analyzer. For more details, visit LTE Analyzer webpage.

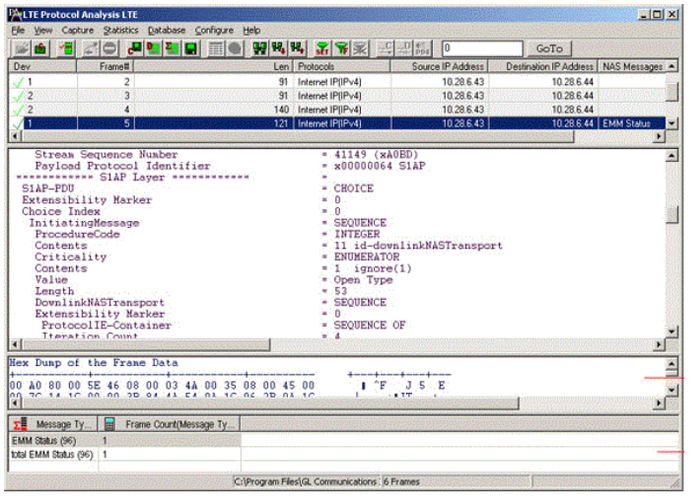

Figure: LTE Protocol Analyzer Software (PKV107)

MAPS™ LTE S1 Emulator

GL's MAPS™ designed for testing LTE – S1 interface (any interface excluding Air interface) can emulate eNodeB (Evolved Node B), and MME (Mobility Management Entity). For more details, visit MAPS™ LTE S1 webpage.

MAPS™ LTE eGTP-c Emulator

GL's MAPS™ designed for testing LTE S11, S5/S8 (eGTP) interfaces can emulate MME (Mobility Management Entity), SGW (Serving Gateway), and PGW (Packet Data Network Gateway) network elements. For more details, visit MAPS™ LTE eGtp webpage.

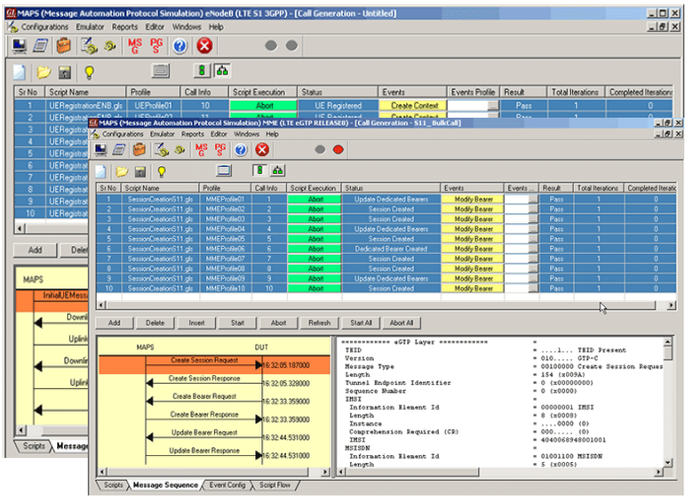

Figure: MAPS™ LTE S1 Emulator (PKS140) and MAPS™ LTE eGTP-c Emulator (PKS142)

MAPS™ LTE X2 Emulator

GL's MAPS™ X2 Application Protocol (X2-AP) is used to co-ordinate handovers and perform load management between eNodeB (Evolved Node B) network elements - Source eNodeB and Target eNodeB. For more details, visit LTE X2 Application Protocol Testing webpage.

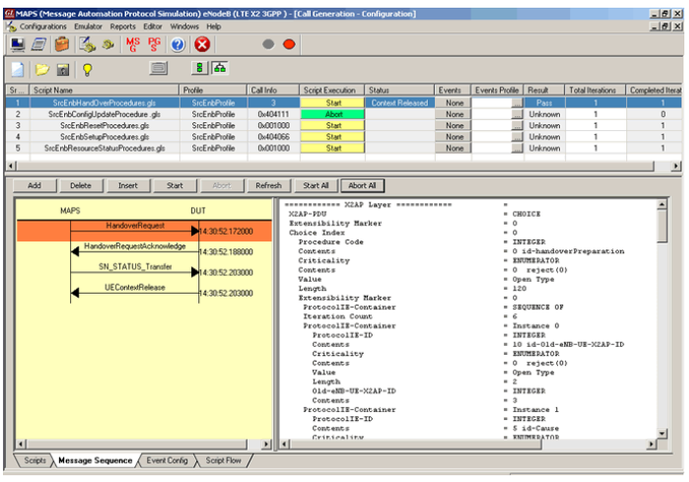

Figure: MAPS™ LTE for X2 AP Emulator (PKS141)

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ATM Protocol Analysis and Emulation

Back

ATM Protocol Analyzer
(over T1 E1, T3 E3, OC3 OC12)

GL's **Asynchronous Transfer Mode (ATM) Protocol Analyzer** is used to analyze and decode different ATM protocols like ATM, AAL2 Protocols (CPS-SDU, SSSAR-SDU, and SSCS), AAL5 (CPCS), UNI etc. across U plane and C plane of UNI and NNI interface over T1 E1, T3 E3, OC3 OC12. The analyzer can also decode ATM frames constituting Classical IP over ATM, or CIP based networks, and traditional SS7 Stack (ISUP, SCCP, MAP, CAMEL (CAP) etc.) over ATM. The analyzer is also available as Remote and Offline HDLC analyzer.

For more details, visit ATM Protocol Analyzer webpage.

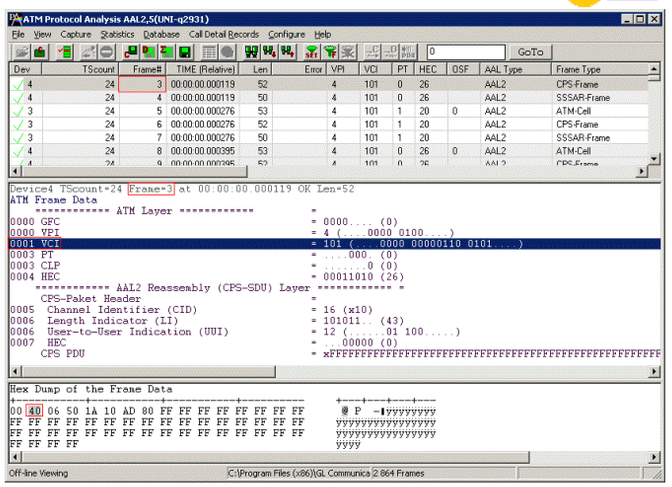

Figure: ATM Analyzer Software (XX160)

Client-Server ATM IMA Emulator
(over T1 E1)

GL's **ATM IMA (Inverse Multiplexing over ATM) Emulator** is client-server based application with GL's T1 E1 Analysis hardware. The ATM IMA Emulator application can simulate the inverse multiplexing of an ATM cell stream over multiple physical links (up to 16 T1 or E1 ports) and retrieve the original stream at the far-end from these physical links.

For more details, WCS ATM IMA Emulator webpage.

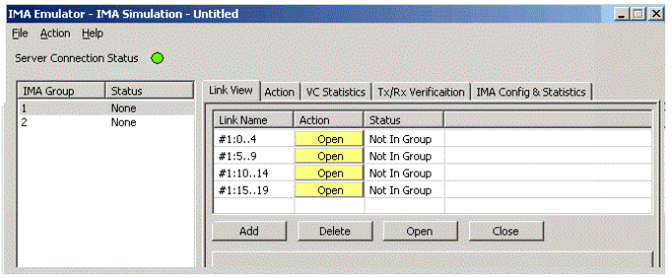

Figure: ATM IMA Emulator Software (XX654)

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Frame Relay Protocol Analysis and Emulation

Back

Frame Relay Protocol Analyzer
(over T1 E1, T3 E3, Datacom)

GL's **Frame Relay Protocol Analyzer** can be used to analyze and decode frames conforming to Q.921, Q.922, LAPF, Frame Relay Forum standard -FRF.9 and FRF.12, Multiple Protocol Encapsulation, LCP RFC1661, Q.933 SVC and LMI SNAP, PPP, IP, SMTP, POP3 and so on. The analyzer is also available as Remote and Offline Frame Relay analyzer. For more details, visit Frame Relay Analyzer webpage.

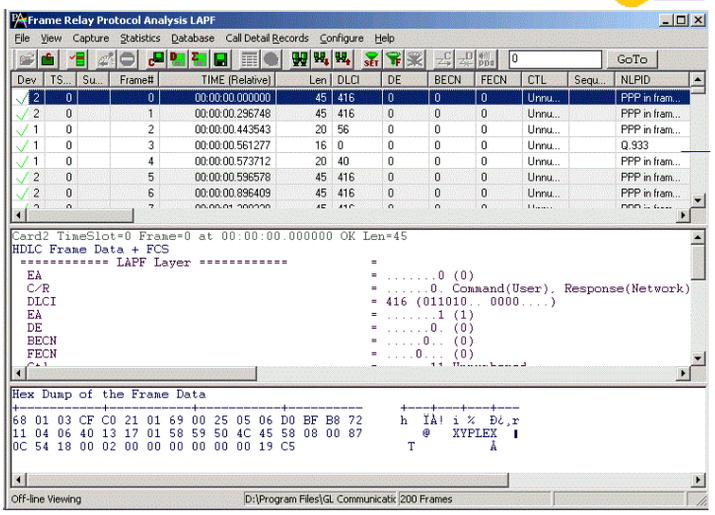

Figure: Frame Relay Analyzer Software (XX130)

Client-Server Multi-link Frame Relay Emulation
(over T1 E1)

Multi-Link Frame Relay, or MFR, is similar to Multi-Link PPP, and both are a form of inverse multiplexing. MFR works by bundling multiple T1 circuits into a multilink bundle and fragmenting the individual frame relay frames into fragments. These fragments are then transported in parallel over the multiple T1 circuits.

For more details, visit WCS Frame Relay Emulator webpage.

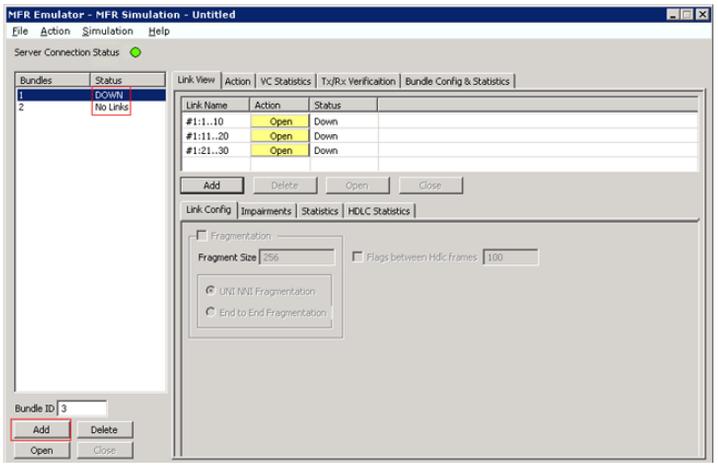

Figure: Multi-link Frame Relay (MFR) Emulation with Client-Server (XX655)

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CDMA, GR-303 Protocol Analysis

Back

CDMA 2000 Protocol Analyzer (over T1 E1)

GL's **CDMA Protocol Analyzer** can be used to analyze and view protocols across A1 (between Base Station Controller and Mobile Switching Centre), A3 and A7 (between two Base Station Controllers), A9 (between Base Station Controller and Packet Control Function), and A11 (between Packet Control Function and PDSN) signaling interfaces. The analyzer is also available as Remote and Offline CDMA analyzer. For more details, visit CDMA 2000 Analyzer webpage.

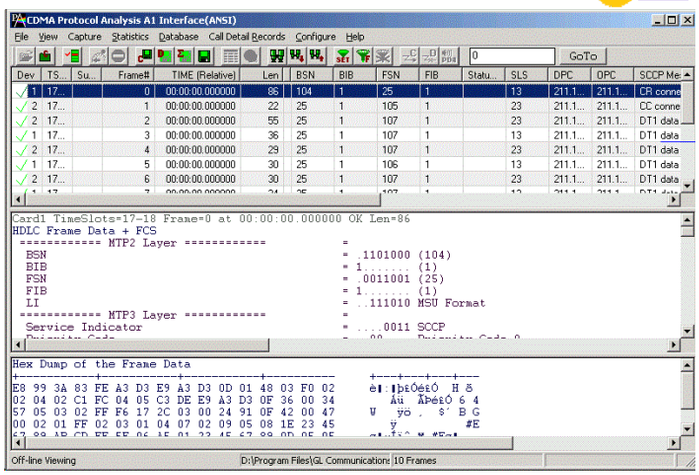

Figure: CDMA 2000 A1 Interface (XX142, OLV142)

GR-303 Protocol Analyzer (over T1 E1)

GL's **GR303 Protocol Analyzer** offers testing for all aspects of GR-303 systems: monitoring T1 Line, monitoring the TMC/CSC control channel, monitoring EOC channel, viewing robbed ABCD signaling and dialed digits, listening to voice channels, and thorough tests for the physical layer. GR-303 uses three message-based signaling channels namely, Timeslot Management Channels (TMC), Common Signaling Channels (CSC), and Embedded Operation Channels (EOC). TMCs are used for timeslot allocation and call processing messages between the RDT and the LDS. For more details, visit GR-303 Analysis webpage.

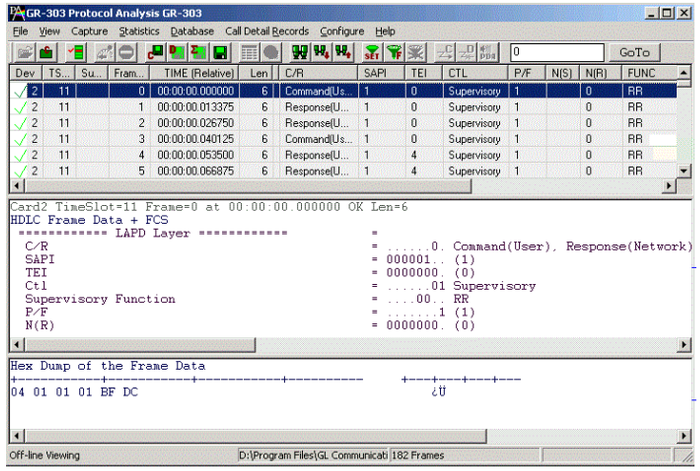

Figure: GR-303 Analyzer (XX140, OLV140)

Protocol Identifier

The **Protocol Identifier** application can identify various protocols, traffic types at a concentration point, DSX patch panel, or multiplexed facility on T1 or E1 lines. Supported protocols are - ISDN, ATM, HDLC, MTP2, LAPD, SS7, PPP, GSM, GSM Abis, TRAU, and Frame Relay. The timeslots and the sub-channels within the timeslots are also identified. Once identified, a detailed protocol analysis can be carried out by individual protocol analyzers. This application is helpful in identifying For more details, visit Protocol Identifier webpage.

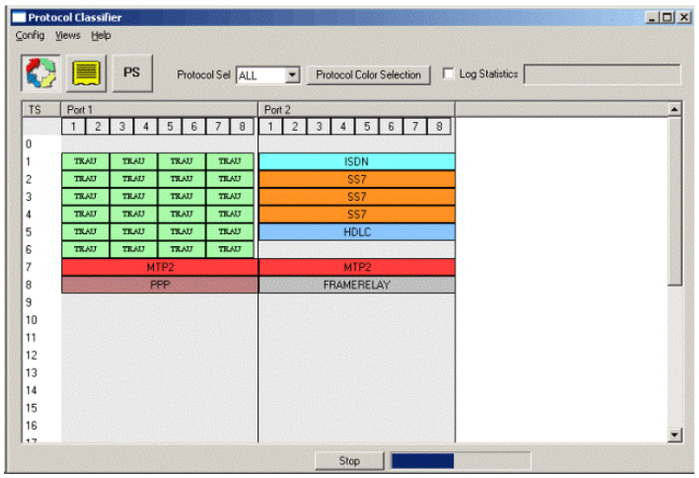

Figure: Protocol Identifier (XX089)

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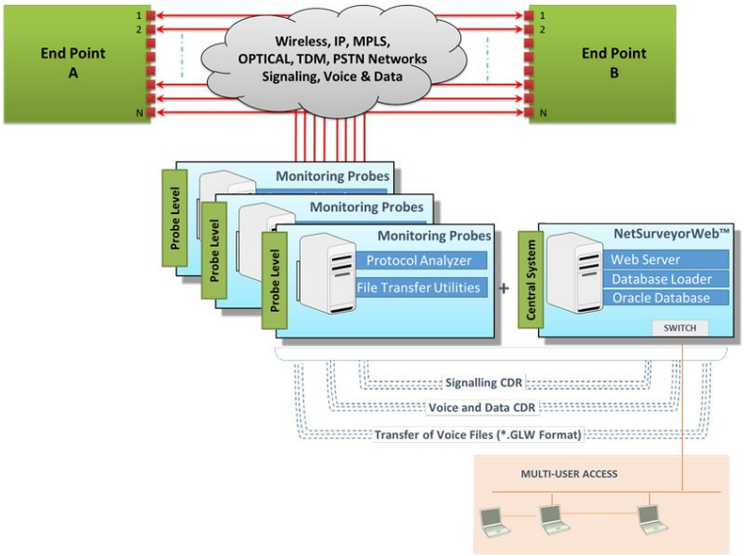
Network Monitoring Solutions (NMS)

Back

NMS for 3G Networks (over T1 / E1 / IP)

The network monitoring systems facilitate real-time analysis, historical storage, retrieval, querying, and display of **Call Detail Records (CDRs)** by non-intrusively connecting to **TDM, Optical, or IP networks**.

- Typical application includes Call Detail Records, fraud detection and location, remote protocol analysis and troubleshooting, real-time signaling monitor, traffic optimization engineering, statistics
- NMS features include a central database for historical and near real time data storage, a WebServer for "browser based" access to information
- Records are stored into a relational database (Oracle, DB2, Sybase, Microsoft Access, etc.) using ODBC
- The web-based client NetSurveyor™ connected to T1 / E1 / IP probes through a web server facilitates result display using a web interface



For more information, visit Network Monitoring and Surveillance System webpage.

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