Emualation of PPP and MLPPP Links

Fragmentation and Reassembly

Splitting, Recombining and Sequencing datagrams

Analyzes host of PPP protocols

Testing across LAN and WAN environment

Analysis of PPP routed and bridged protocols

Non-intrusive analysis using GL's T1/E1 Analyzers

Supports LCP, PAP, BPDU, SNMP, DNS, DHCP, HTTP, SMTP, POP3 and more

Summary, Detail, Statistics, and Hex Dump views

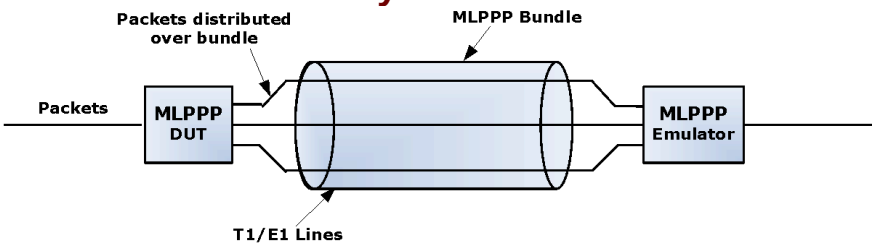
Real-Time and Off line Filter/Search ability

Real-Time and Offline Analysis

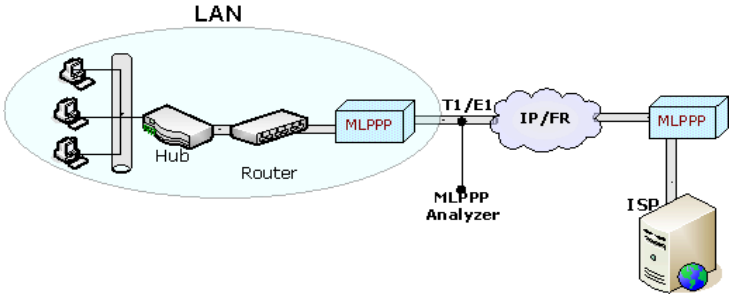
Statistics based on frame count, byte count etc

Automated Testing

MLPPP Analysis and Emulation



MLPPP aggregation of T1 lines into a single bundle



Overview

MLPPP bundles multiple link-layer channels into a single network-layer channel. A bundle can consist of multiple physical links of the same type or physical links of different types. Data sent through this channel will be distributed among all the links.

The Point-to-point protocol (PPP) is a link layer protocol, which encapsulates other network layer protocols like IP for transmission on synchronous (like T1/E1) and asynchronous communications lines. When transmitted over T1/E1 line, PPP frames are based on HDLC frame structure. Today the PPP protocol standard finds wide use in synchronous connections between LANs, bridges, routers and other intermediate devices. Two major features of PPP protocol are:

- Authentication
- Encapsulation of higher layer protocols.

For more details, please visit our web page http://www.gl.com/mlppp.html.

MLPPP Analyzer

The ML-PPP Analyzer provides useful analysis of the PPP and MLPPP protocols, which includes distribution of protocols, protocol fields, frame lengths and frame status. The ML-PPP analyzer has the ability to decode PPP and MLPPP packets

GL's MLPPP Analyzer can be used to capture a host of PPP protocols exchanged between the two nodes over T1/E1 link. User can obtain detailed analysis of the protocol and can perform various statistics measurements. GL Communications supports the following types of ML-PPP Analyzers: GL Communications supports the following types of MLPPP analyzers:

- Real-time MLPPP Analyzer (Pre-requisites: GL's field proven E1 or T1 internal cards or USB Laptop E1 or T1 external units required licenses and Windows 2000/XP Operating System)
- Offline MLPPP Analyzers (Pre-requisites: Hardware dongle and Windows 2000/XP Operating System)

MLPPP Emulator

Multilink PPP (MLPPP) is an extension to the PPP (Point To Point Protocol) that allows splitting, recombining, and sequencing datagrams across multiple data links into a single logical bundle.

MLPPP Emulator application simulates the Point-to-Point (PPP) and Multi-Link Point-to-Point (MLPPP) protocols. MLPPP bundles multiple link-layer channels into a single network-layer channel. Data sent through this channel will be distributed among all the links get queued bytes fashion. The MLPPP Emulator application has two simulation modes, **MLPP** and **PPP.**

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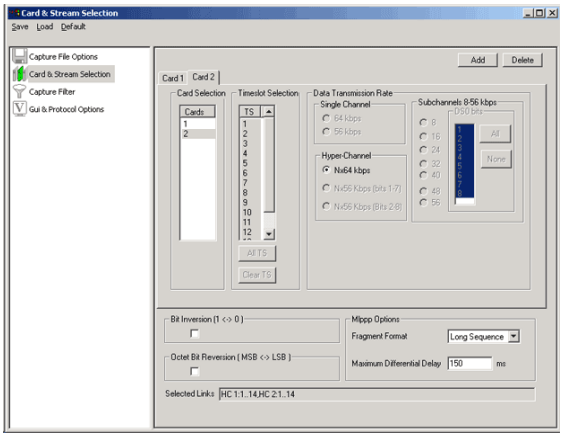
MLPPP Analyzer

Main Features

- Ability to test and perform numerous measurements across WAN- LAN or LAN-LAN connection
- Ability to test and analyze HDLC based PPP protocol in synchronous environment
- Ability to capture and decode both PPP routed and PPP bridged protocols
- Supports a host of PPP based protocols i.e. LCP, NCP, PPP BPDU, PAP, CHAP, HTTP, SNMP, FTP, DNS, and DHCP etc.

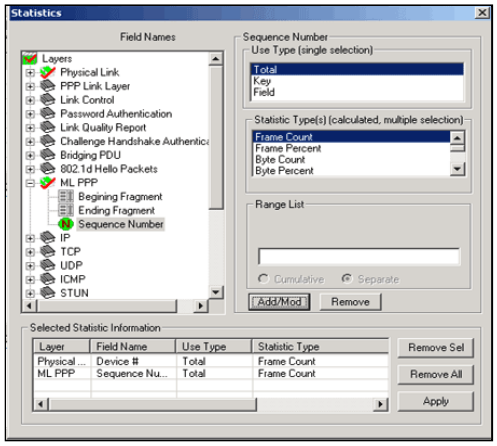
Summary, Detail and Hexdump Views

The analyzer displays summary, detail, statistics, and hex dump views in different panes. The summary pane displays Frame Number, Time, Length, Error, Layer3 Protocol, LCP Code, Seq No and PPP Message type. The user can select a frame in summary view to analyze and decode each frame in the detail view. The Hex dump view displays the frame information in HEX and ASCII formats.



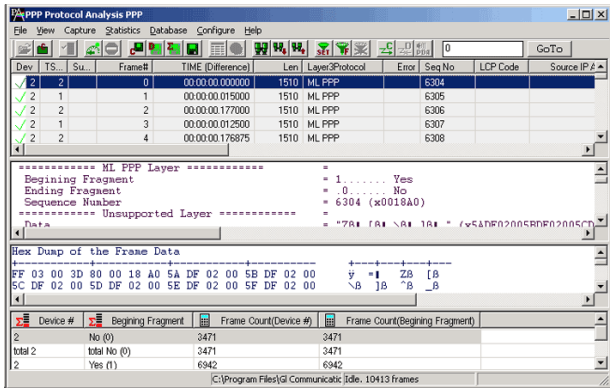
Filtering and Search

Filtering and search capability adds a powerful dimension to the PPP Analyzer. This feature can isolate required frames from all frames in real-time, as well as offline. This allows filtering according to Frame Number, Time, Length, Error, Layer3 Protocol, LCP Code, Seq no, TCP and UDP source and destination port and PPP Message type. Similarly, Search capability helps user to search for a particular frame based on specific search criteria.



Main Features (Contd…)

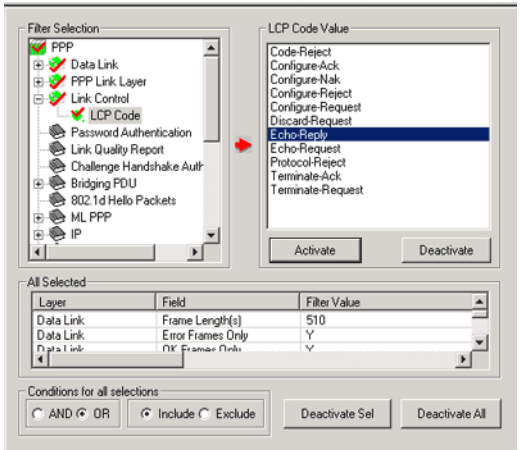
- Remote monitoring capability using GL's Network Surveillance System.
- Capability to export summary as well as detail information to an ASCII file for subsequent import into a database or spreadsheet
- A single instance of the analyzer supports capturing of frames on multiple groups of timeslots on various cards. In addition, each group of timeslot selection can have different data rates.



Real-time and Offline Analysis

Users can capture and analyze PPP frames carried on n*DS0 channel in real-time and record all or filtered traffic into a trace file.

The recorded trace file can be exported to a comma-delimited file for subsequent import into a database or spreadsheet Recorded trace file can be opened later for offline analysis User can capture raw data and can then transmit using the HDLC File Playback application



Statistics View

Statistics is an important feature available in PPP analyzer and can be obtained for all frames both in real-time as well as offline mode. Numerous statistics can be obtained to study the performance and trend in the PPP network and it is based on protocol fields and different parameters e.g. Use Type, Statistic type, and various patterns.

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MLPPP Emulator

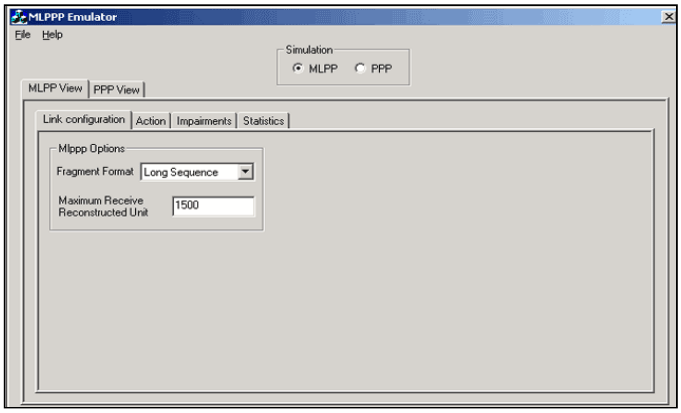
Main Features

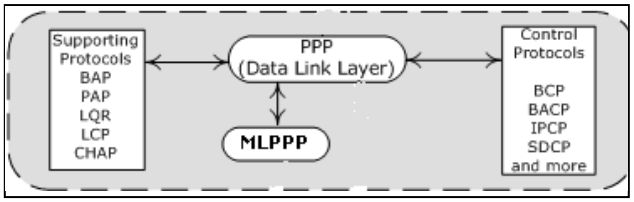
- Supports Fragmentation & Reassembly
- Supports different Fragment sizes (64, 128, 256 and 512)
- Supports ACFC and PFC compression/decompression.
- Detailed Statistics reporting (Number of transmitted/received octets, frames, fragments, lost fragments, and PPP/ML/MC packet fragments received with invalid sequence numbers)
- Data source can be any pattern files like *.pcm, *.ber, *.txt, etc

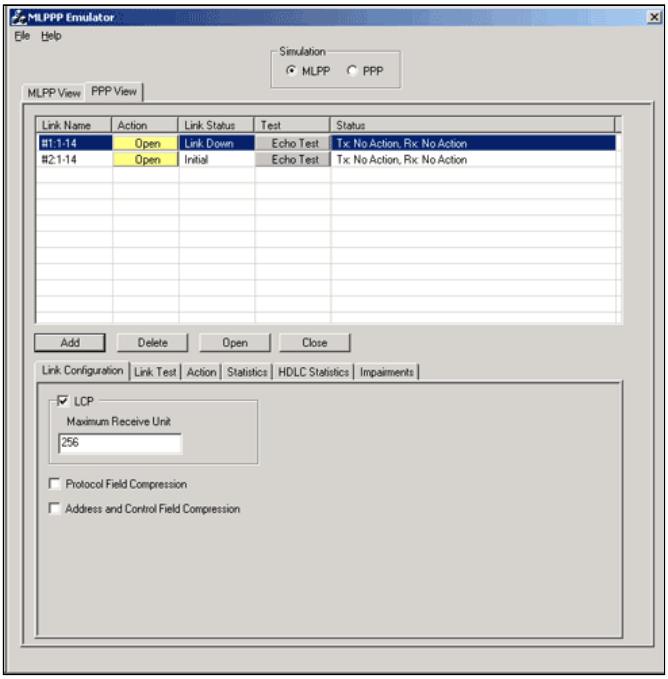
Protocols Supported

Multilink PPP (MLP), as defined in RFC 1990, is a variant of PPP used to aggregate multiple WAN links into one logical channel for the transport of traffic. The Point-to-Point Protocol (PPP), as described in RFC 1661, provides an encapsulation protocol for transporting network layer traffic over point-to-point links, such as synchronous serial or Integrated Services Digital Network (ISDN).

High-Level Data Link Control (HDLC) protocol for encapsulating datagrams is an extensible Link Control Protocol (LCP) to establish, configure, and test the data link connection and to negotiate configuration parameters.







Link Configuration

The PPP connection uses 'Link Control Protocol' (LCP) to establish a connection and control the established PPP links. The MLPPP simulation is provided with link configuration tab, where the users can specify parameters such as **Maximum-Receive-Reconstructed-Unit (MRRU), Fragment Format, and Maximum Receive Unit (MRU),**.

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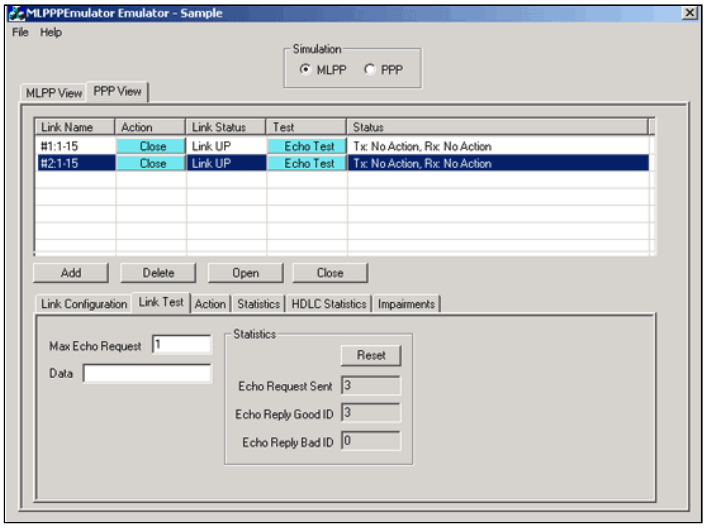

Link Test

The link test provides parameters to check the connectivity in the link. It confirms the presence of the PPP link at peer end, by sending an echo request and receiving an echo reply.

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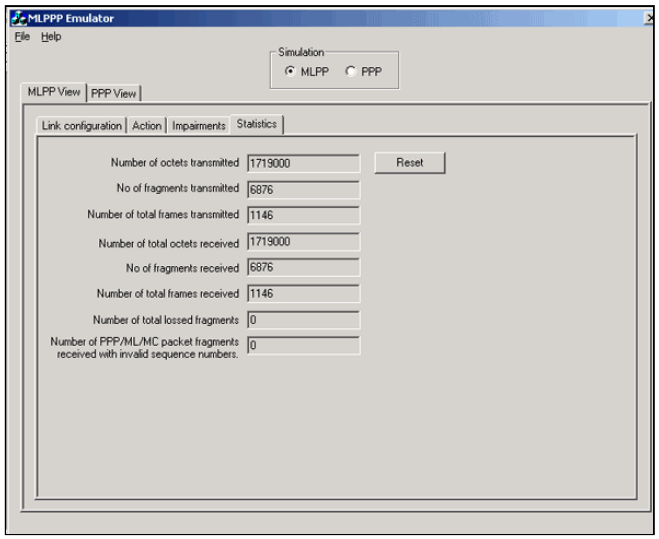
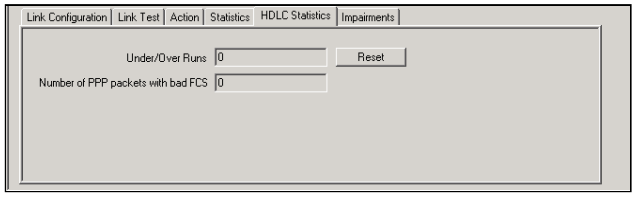
Data Tx/Rx

Data Transmission and Reception can be done on the opened PPP links. Data can be sent and received (simultaneously) on each link separately.

TX-Params allows users to transmit a file continuously, or upto limited number of bytes (on the selected PPP link or bundle of PPP links). Users can also generate and transmit Sequence Numbers as data. **RX-Params** allow users to record data to a file received on the selected PPP link or the PPP bundle. In addition, users can verify the sequence numbers generated at the peer end.

The difference between MLPPP and PPP simulation is that, in **PPP, simulation of each link is separate** and hence the Link Configuration, Tx/Rx Action, Statistics, and Impairment are set differently for each link. In MLPPP all the available links are considered as a single MLPPP Bundle.





Buyers Guide:

XX135 - Real-Time MLPPP Protocol Analyzer (T1 or E1)
OLV135 - Offline MLPPP Analyzer

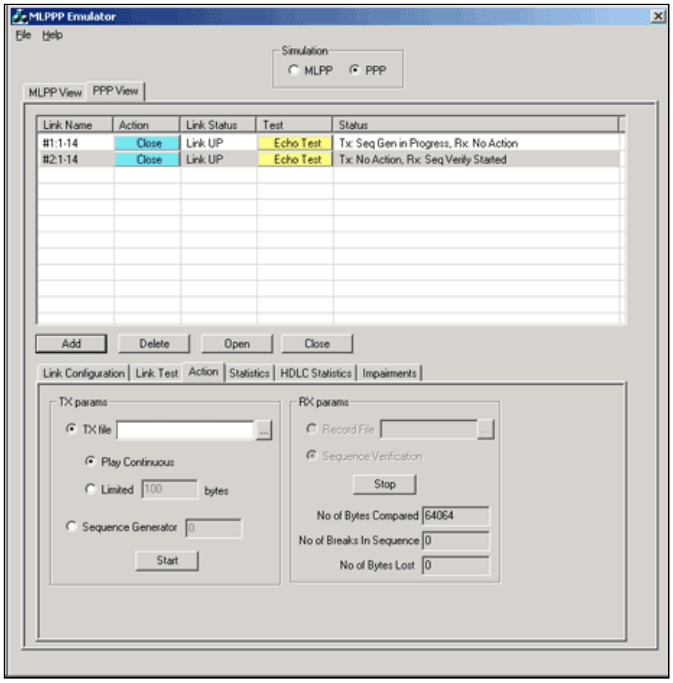
Related Software

XX600 - Basic Client/Server Scripted Control Software
XX635, XX636, XX637 - w/PPP, MLPPP, & Multi-Channel (MC) MLPPP Emulation and Analysis
XX634 - w/Multi-Channel HDLC Emulation and Analysis , File based High Throughput HDLC Record/Playback
XX020 - Record/Playback File Software
XX646 - Multi-Channel TRAU Tx/Rx Emulation and Analysis

Related Hardware

UTE001 - Portable USB based Dual T1 or E1 Laptop Analyzer
HDT001/HDE001 - HD T1 or E1 PCI Cards

*Specifications are subject to change without notice.



Statistics and HDLC Statistics

In MLPPP simulation, statistics provides important information about the MLPPP bundle such as Number of transmitted/received octets, frames, fragments, lost fragments, and PPP/ML/MC packet fragments received with invalid sequence numbers.

In PPP Simulation, statistics provides information regarding data being transmitted/received for the selected PPP link. HDLC Statistics

HDLC Statistics

The errors that occur during file transmission like the Under/Over Runs and Number of PPP packets with bad FCS (Frame Check Sequence) are recorded in the HDLC Statistics

Multi Class MLPPP

The Multi-Class Extension to Multi-Link PPP allows a sender to fragment the packets of various priorities into multiple classes of fragments, and allows high-priority packets to be sent between fragments of lower priorities.

MP's monotonically increasing sequence numbering (contiguous numbers are needed for all fragments of a packet) does not allow suspension of the sending of a sequence of fragments of one packet in order to send another packet. So in order to provide more than one level of suspension with PPP Multilink is to run Multilink multiple times over one link.

This Multi-Class Extension to Multi-Link PPP option is soon to be implemented in MLPPP Emulator

Automated MLPPP Testing using WCS

Automated testing of HDLC, PPP and MLPPP can be accomplished using WCS and appropriate modules (MLPPPTerr). These tools allows you to use script based GL's clients or embed it into your test environment.

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