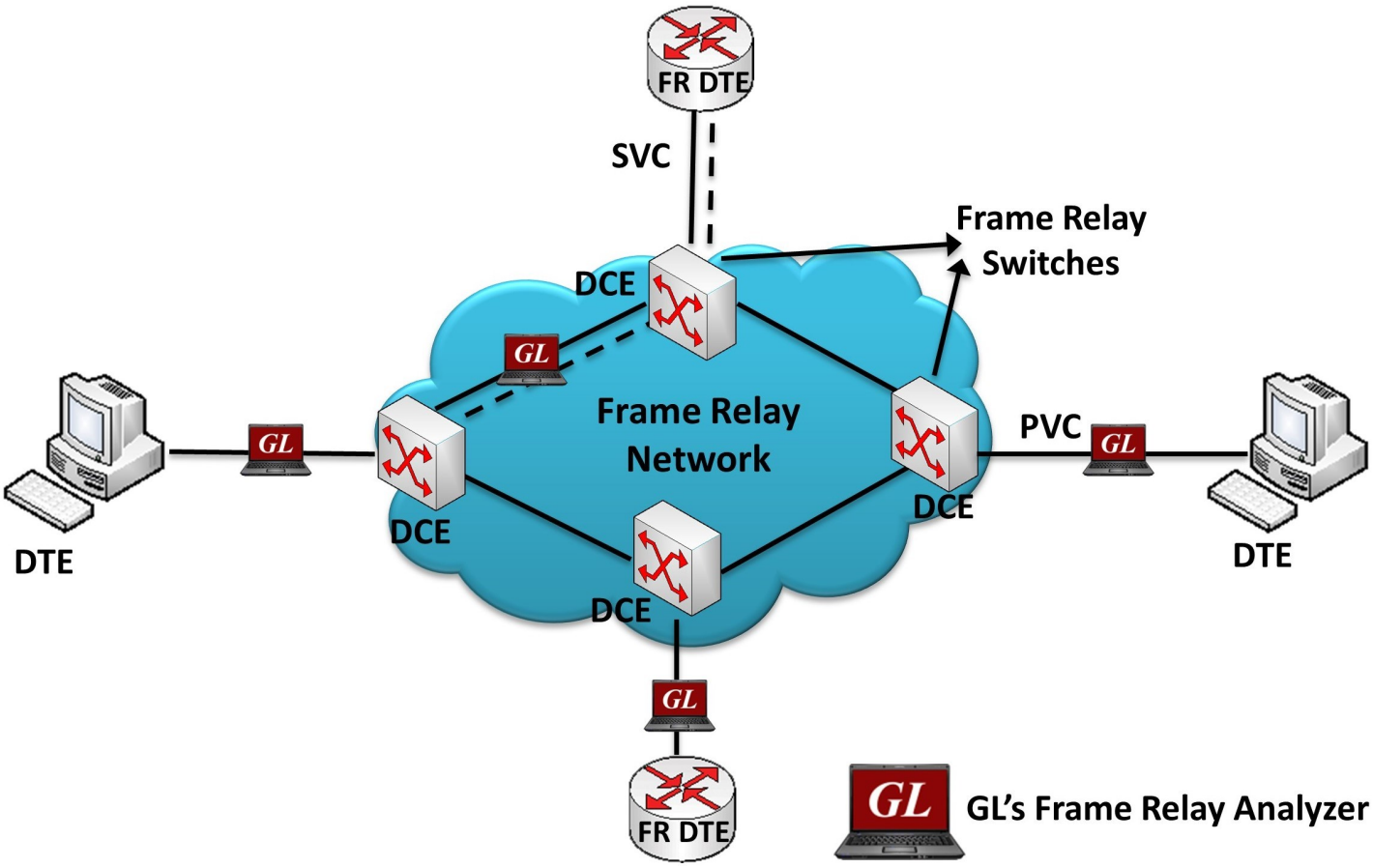
Frame Relay Protocol Analyzer



Overview

Frame relay is a commonly used data link protocol based on packet switching technology. Frame relay is mostly used to connect local area networks with major backbones; also used in public wide area networks and in private network environments with leased lines over T1 E1 lines.

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.

GL Communications supports the following types of Frame Relay analyzers:

- Real-time Frame Relay Analyzer (Pre-requisites: GL's T1 E1 internal cards or USB T1 E1 external units, required licenses and Windows® Operating System)
- Remote/Offline Frame Relay Analyzers (Pre-requisites: Hardware Dongle, and Windows® Operating System)

For more details, refer Frame Relay Protocol Analyzer webpage.

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Main Features

Display Features

- Displays Summary, Detail, Hex-dump, and Statistics Views
- Detail View:
  - Displays decodes of a user-selected frame from the summary view
  - Provides options to display or hide the required protocol layers
  - Contents of this view can also be copied to clipboard
  - Provides option to toggle detail view vertically or horizontally as feasible for the user
- Hex dump View displays the frame information in HEX and ASCII format, the contents of this view can also be copied to clipboard
- Statistics View displays call and MSU statistics at any link or entire link set
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields.
- Option to combine data from multiple columns under one column
- Option to create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results efficiently

Supported Protocols

- LAPF

Filtering / Search

- Advanced filtering and search based on any user selected protocol fields
- Supports filtering and search based on LAPF parameters and Q.933 layer parameters such as DLCIs, Message Type, FECN, BECN, DE, NLPID's TCP, IP, SMTP, POP3, and so on
- Allows the user to automatically create search/filter criteria from the current screen selection

Capturing Streams

- Streams can be captured on the selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth
- Frames can be transmitted/captured in either 64 kbps, 56 kbps, n x 64 kbps, or n x 56 kbps data channels (hyper-channels)
- Supports capturing of encapsulated protocols, and long frames up to 16 Kbytes
- Supports decoding of FRF.12 fragment with both UNI-NNI fragmentation and End-to-End fragmentation
- Supports simultaneous decode of multiple streams of Frame Relay traffic on different T1 E1 channels
- Supports decoding of frames with FCS of 16 bits and 32 bits, or none
- Multiple streams of traffic on various T1 E1 channels can be simultaneously decoded with different GUI instances

Export Options

- Exports Summary View information to a comma delimited file for subsequent import into a database or spreadsheet
- Capability to export detailed decode information to an ASCII file

Remote Monitoring

- Remote monitoring capability using GL's Network Surveillance System

Call Detail Record

- Call details recording feature includes data link groups that help in defining the direction of the calls in a given network and form logical groups comprised of unidirectional (either ‘Forward’ or ‘Backward’) data links

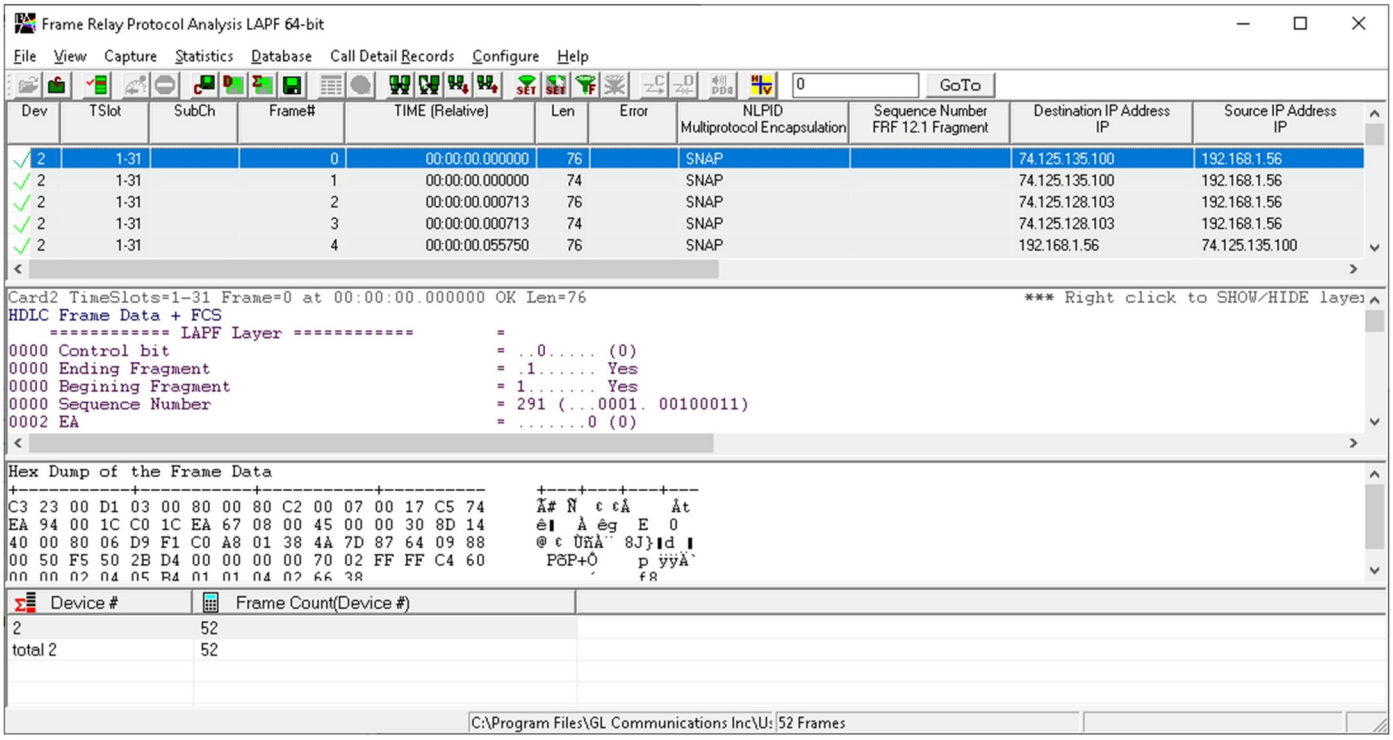
Main Features (*Contd.*)

Additional Features

- Analyzes Permanent Virtual Connection (PVC) and Switched Virtual Connection (SVC) frames
- The following variations are accommodated in the software
  - Inverted or non-inverted data
  - Byte reversal or non-reversal
- Trace files for analysis can be loaded through simple command-line arguments
- Multiple trace files can be loaded simultaneously with different GUI instances for offline analysis

Summary, Detail, and Hex dump Views

The analyzer displays Summary, Detail, and Hex Dump View in different panes. The Summary View displays Frame Number, Time, Length, Error, DLCI, DE, BECN, FECN, CTL, NLPID and more. User can select a frame in Summary View to analyze and decode in the Detail View. The Hex dump View displays the frame information in HEX and ASCII format. The contents of detail and hex dump view can also be copied to clipboard.

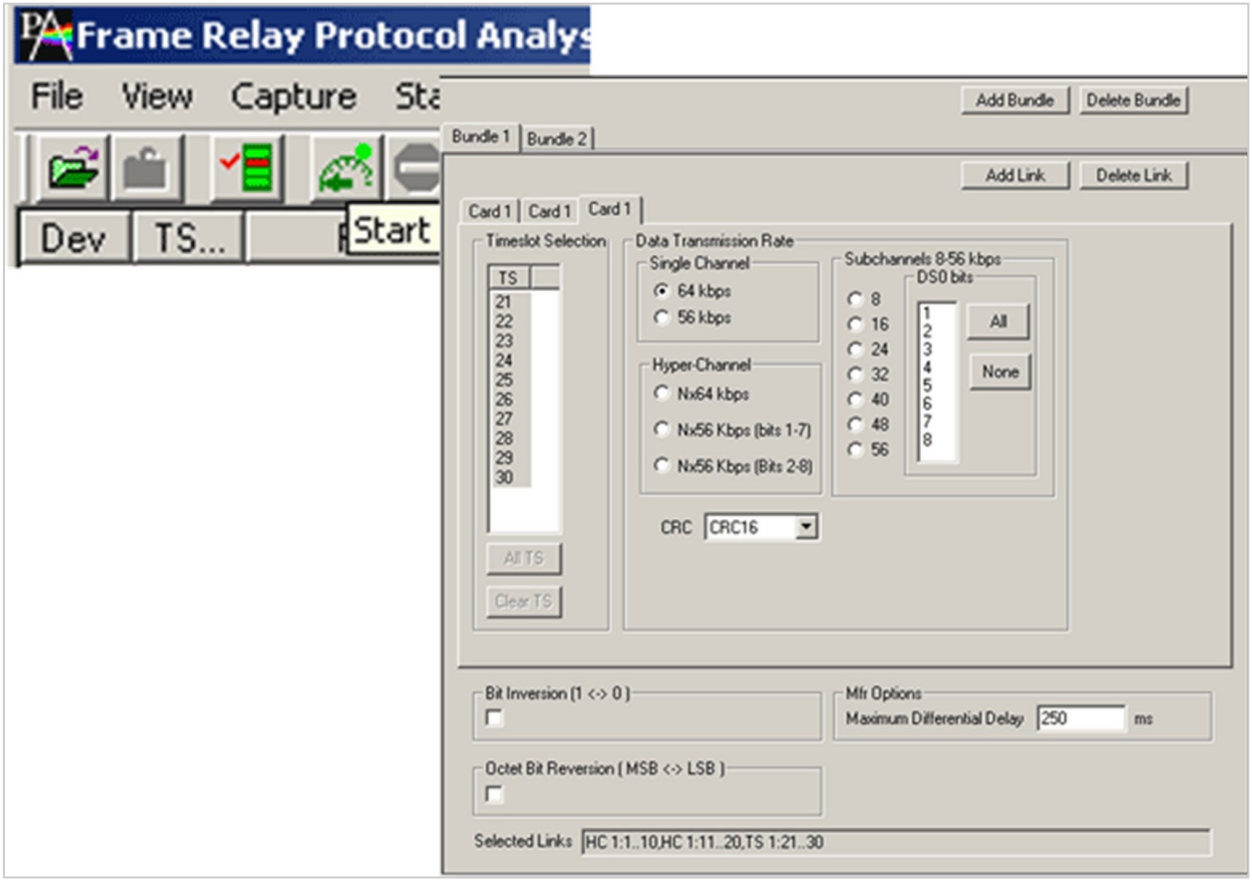


Summary, Detail, and Hex dump Views

Real-time and Offline Analysis

Users can capture and analyze frame relay frames using either real-time or remote analyzers, and record all or filtered traffic into a trace file. The Frame Relay analyzer supports reassembly and decoding of multiple MFR bundles simultaneously. Each MFR bundle will reassemble packets from Frame Relay links.

The real-time capturing requires user to specify timeslots, bit inversion, octet bit reversion, hyper channel selection, CRC, and MFR options (max differential delay). The captured raw data can then be transmitted using the HDLC File Playback application. The recorded trace file can be used for offline analysis or exported to a comma-delimited file, or ASCII file.



Stream / Interface Selection

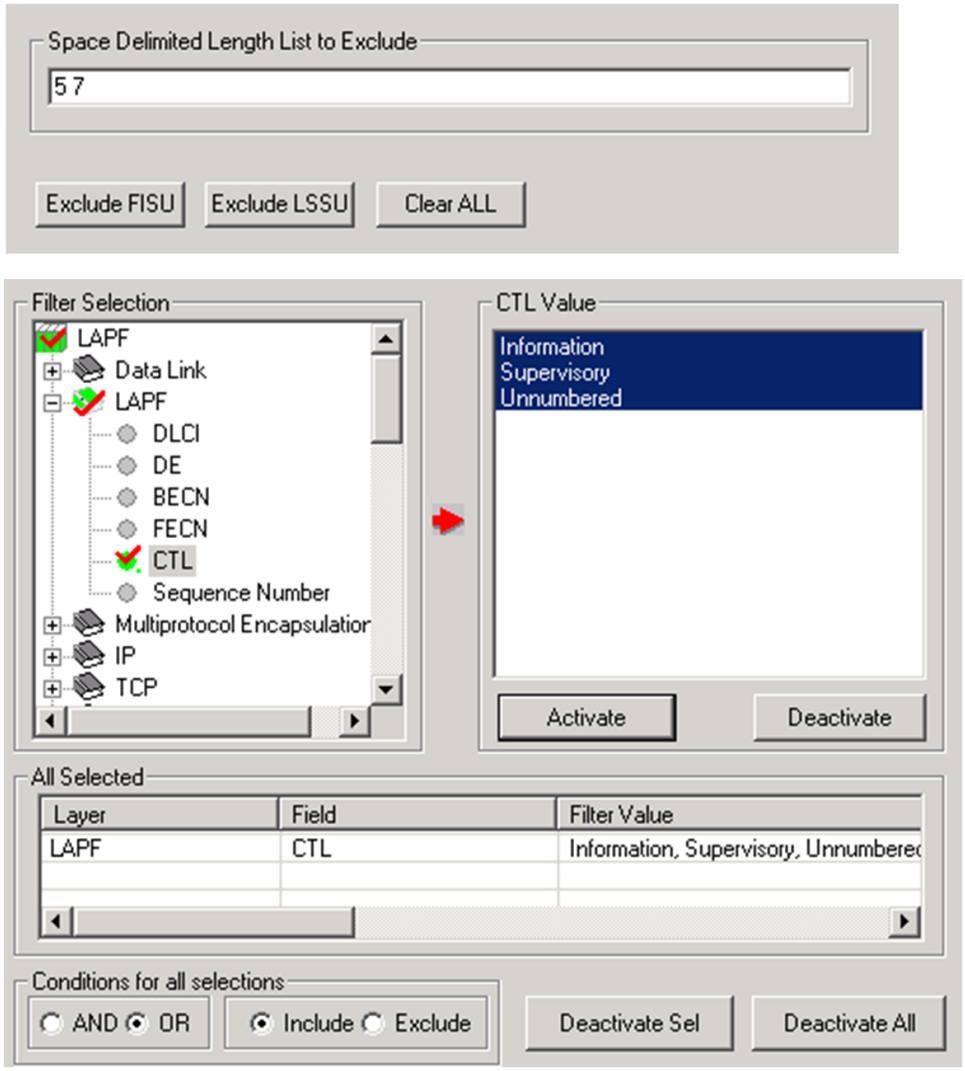
Filtering and Search

Users can record all or filtered traffic into a trace file and also can create search/filter criteria automatically from the current screen selection.

The filter and search options add a powerful dimension to the Frame Relay analyzer that isolates required frames from the captured frames in real-time/remote/offline.

Users can specify custom values for frame length to filter frames during real-time capture. The frames can also be filtered after completion of capture based on Frame Number, Time, Length, Error, DLCI, DE, BECN, FECN, CTL, NLPID and more.

Similarly, search capability helps user to search for a particular frame based on specific search criteria.

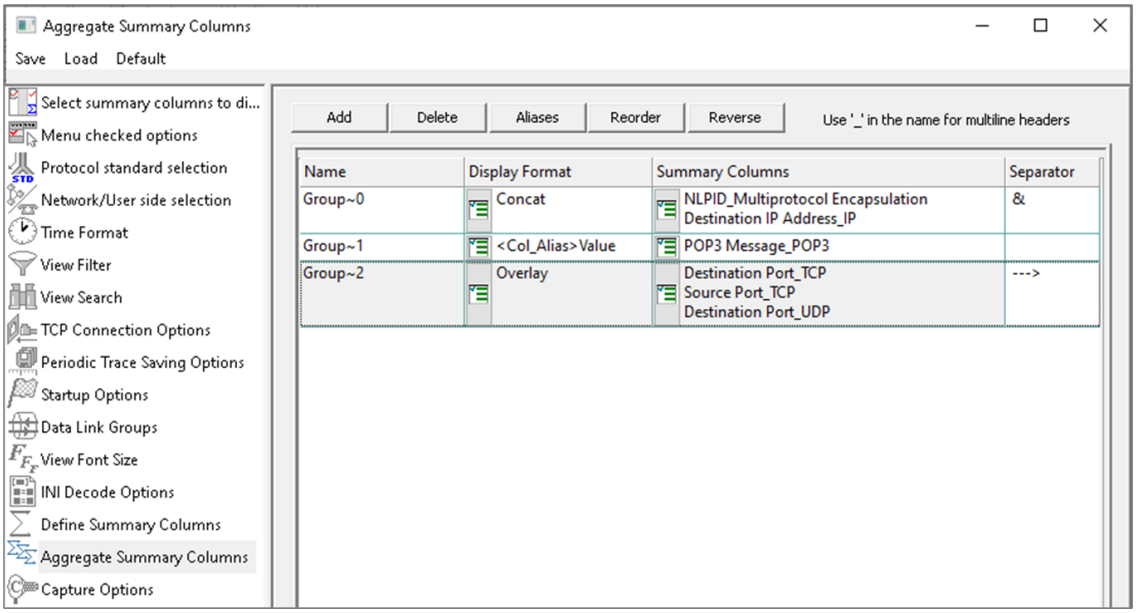


Real-time and Offline Filter

Aggregate Column Group

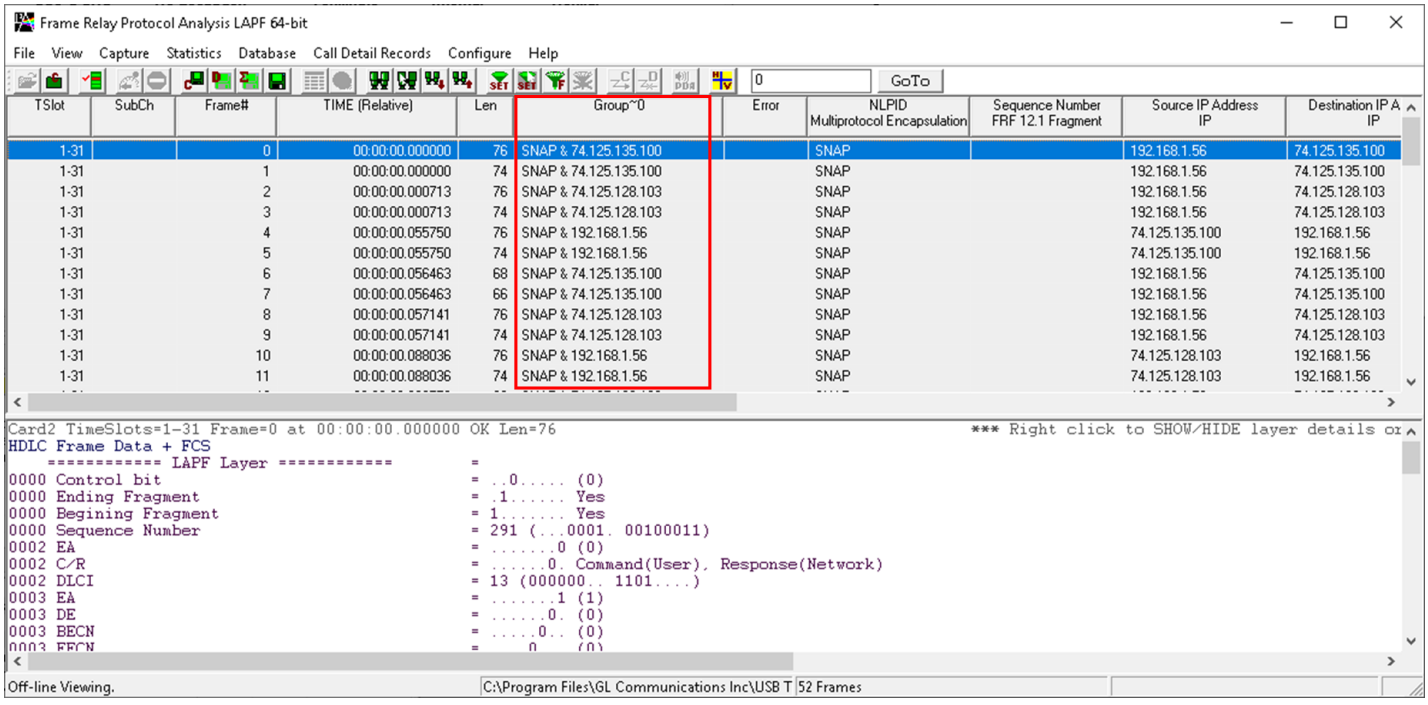
The enhanced feature of the protocol analyzer is aggregate column groups. The user can also create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results in an efficient way.

If the user has five different aggregate columns and wants to prioritize some columns, the user can create a group of aggregate columns with the highest priority and will display only the columns of chosen priority. If the values are null, then the next group values are displayed. The aggregate columns comprising a group will have the same prefix and suffix index as ~0, ~1 … ~N. The **group~0** is the root aggregate group that has the highest priority.



Aggregate Column Group

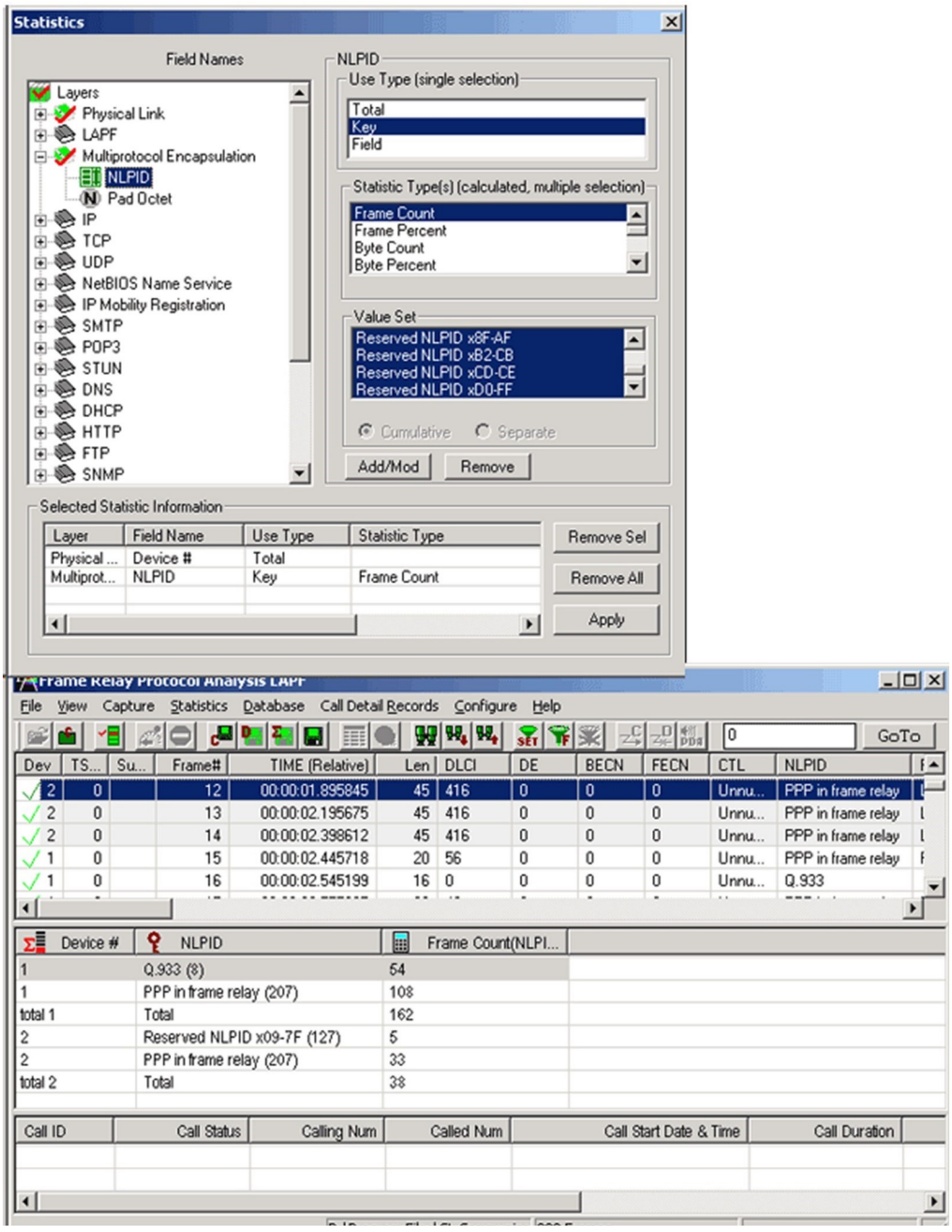
The updated results are as shown in the figure below. Here the root aggregate group~0 summary columns are displayed first and then Group~1 and Group~2 as per the assigned priority if the higher group values are null.



Display of Aggregate Column Group in Summary View

Call Detail Record and Statistics View

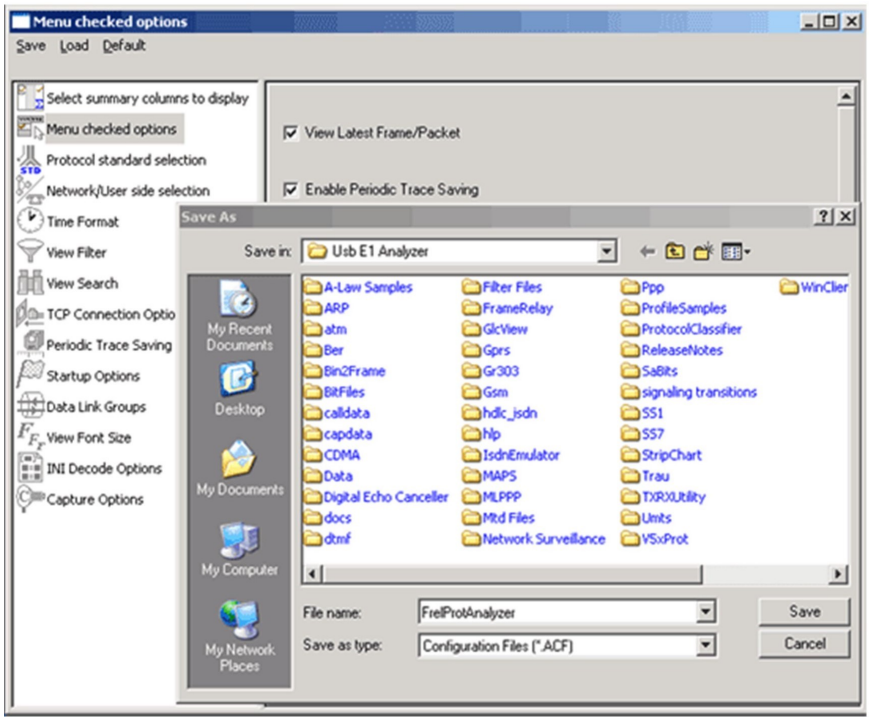
Important call specific parameters like Call ID, Call Status, Call duration, Called/Calling Number, CRV, Release Cause, and so on are calculated and displayed in Call Detail View. Additionally, users are provided with the option to search a particular call detail record from the captured traces. Various statistics can be obtained to study the performance and trend in the Frame Relay network based on protocol fields and parameters.



Statistics and Call Detail Record View

Save / Load All Configuration Settings

Protocol Configuration window provides a consolidated interface for all the important settings required in the analyzer. This includes various options such as protocol selection, startup options, stream/interface selection, filter/search criteria and so on. All the configuration settings can be saved to a file and then loaded for future operations, or user may just revert to the default values using the default option.

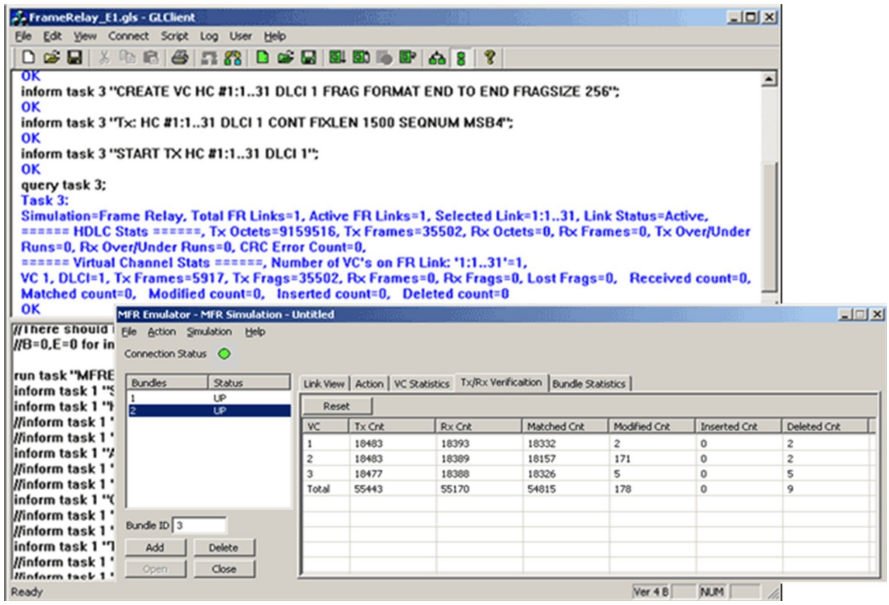


Save / Load Configuration

Frame Relay and Multi-Link Frame Relay Emulation

Automated testing of FR and MFR can be accomplished using an optional client-server based Multi-link Frame Relay Emulator application. The MFR Emulator sends and receives FR links and MFR bundles with or without impairments.

For more details, visit Client Server based Multi-link Frame Relay (MFR) Emulator webpage.



Client-Server based Multi-link Frame Relay Emulation

Supported Protocol Standards

The supported protocol standards in SS7 analyzer are SS7 ITU, SS7 ANSI, SS7 ETSI, SS7 CHINA, and SS7 UK.

Supported Protocols	Specification Used
LAPF	ITU-T Q.922
Multi-Protocol Encapsulation	ETSI EN -301-192
IP	RFC 791
TCP	RFC 793
UDP	RFC 768
SMTP	RFC 2821
POP3	RFC 1939
STUN	RFC 3489
FTP	RFC 959
SNMP	RFC 1157,1155,1902,3416,2863,2578,3418,2011,2012 etc.
DNS	RFC 1035
DHCP	RFC 1533, 2131
HTTP	RFC 2616
RIP	RFC 2453
NBNS (NetBIOS Name Service)	RFC 1002
IPMReg (IPv4 Registration Message)	RFC 3220
Q933FRel	Q.933
SNAP	RFC 1042
PPP over Frame Relay	RFC 1661
FRF.12, FRF12.1, FRF.15	FRF.12, FRF12.1, FRF.15
LCP	RFC 1661
SVC Signaling	
LMI Signaling	

Buyer's Guide

Item No	Product Description
XX130	T1 E1 Real-Time Frame Relay Analyzer
OLV130	T1 E1 Offline/Remote Frame Relay Analyzer

Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 Laptop Analyzer (Require Basic Software)
FTE001	QuadXpress T1 E1 Main Board (Quad Port)
ETE001	OctalXpress T1 E1 Daughter boards (Octal Port)
TTE001	tScan16™ T1 E1 Boards
XTE001	Dual Express (PCIe) T1 E1 Boards

Item No	Related Software
XX600	Basic Client/Server Scripted Control Software (Included with Basic Software)
XX655	Client-Server MFR Emulation

Note: PCs which include GL hardware/software require Intel or AMD processors for compliance.

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