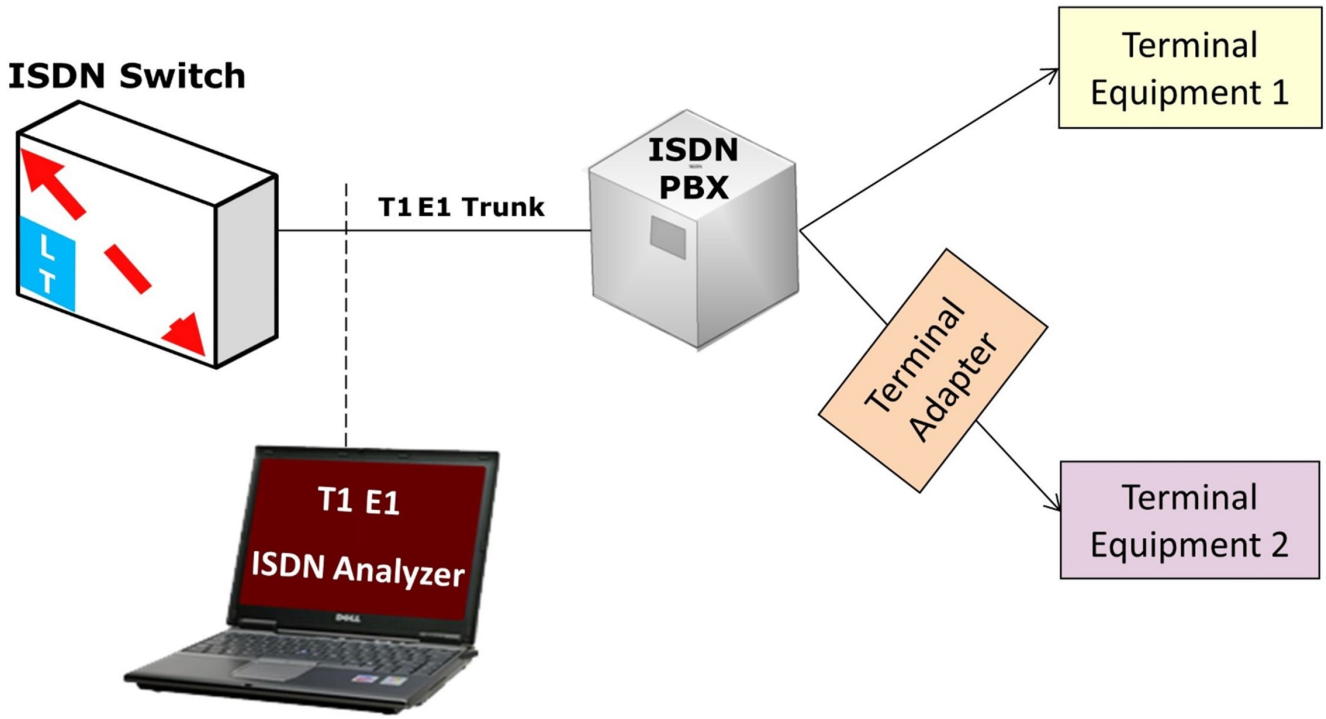
ISDN Protocol Analyzer



Overview

The Integrated Services Digital Network (ISDN) system allows voice, data and video to be transmitted simultaneously across the world using end-to-end digital connectivity. ISDN is an integrated solution for providing basic telephony and data services, whilst offering more telephony services such as supplementary services.

GL's ISDN 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 ITU Q.931, ISDN ANSI, AT&T/Lucent switch 4ESS and 5ESS (TR41449, TR41459 and 235-900-342), Nortel's switch DMS-100 and DMS-250 (NIS-A2111-1 and NIS-A211-4), Bellcore National ISDN-2 (NI-2), Euro ISDN (ETS-300 102-1), QSIG ETSI, ANSI T1.607, DPNSS, DASS2, ARINC 746, ETSI 300-102, QSIG ETSI/ECMA, National ISDN PRI CPE (Telcordia – SR-4994), DPNSS, and DASS2.

GL Communications supports the following types of ISDN analyzers:

- Real-time ISDN Analyzer (Pre-requisites: GL's T1 E1 internal cards or USB T1 E1 external units, required licenses and Windows® Operating System.
- Remote/Offline ISDN Analyzer (Pre-requisites: Hardware Dongles and Windows® Operating System.

These probes now supports Packet Data Analyzer with recording capabilities. Packet Data Analysis (PDA) is an outstanding tool for live monitoring of signaling and traffic over TDM. Allowing users to monitor live TDM networks including capture, analysis, and reporting of every call-in detail.

For more details, please visit our webpage PRI-ISDN Protocol Analyzer.

GL Communications Inc.

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A

(Web) www.gl.com - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) info@gl.com

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.
- Summary View displays Dev #, Time Slot, Frame #, LAPD information, ISDN Message types, and etc in a tabular format.
- 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

- Q.93x, 4ESS, 5ESS, ETSI 300-102, Bell NI2, DMS-100, DMS-250, QSIG ETSI, ISDN ANSI, DPNSS, DASS2, ARINC 746, QSIG ECMA, and Nation ISDN PRI

Filtering / Search

- Advanced filtering and search based on any user selected protocol fields
- 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)
- Variations accommodated in the software include inverted or non-inverted data, and byte reversal or non-reversal
- Multiple streams of ISDN 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

Record/Playback

- Recorded trace files can be played back using HDLC playback application

Call Detail Recording

- Call Detail 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

Remote Monitoring

- Remote monitoring capability using GL's Network Surveillance System

Additional Features

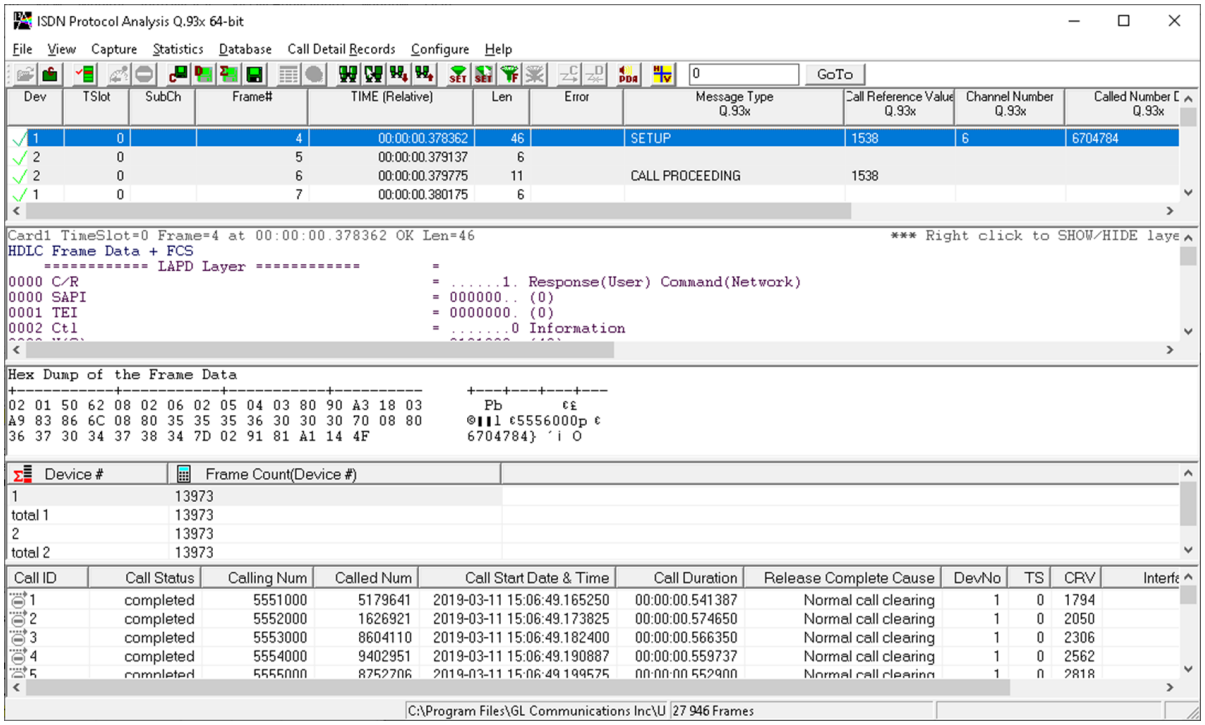
- Status bar displaying information regarding running percent utilization, Number of frames captured, CRC errors and Frame errors etc
- Trace files for analysis can be loaded through simple command-line arguments
- Multiple trace files can be loaded simultaneously with different GUI instances for offline analysis

Packet Data Analyzer (PDA)

- Provides options to capture voice, digits, tones or FAX traffic
- Segregates, captures, and collects statistics on TDM calls
- Provides graphical representation of call analysis, such as ladder diagrams of protocols

Summary, Detail, and Hex dump Views

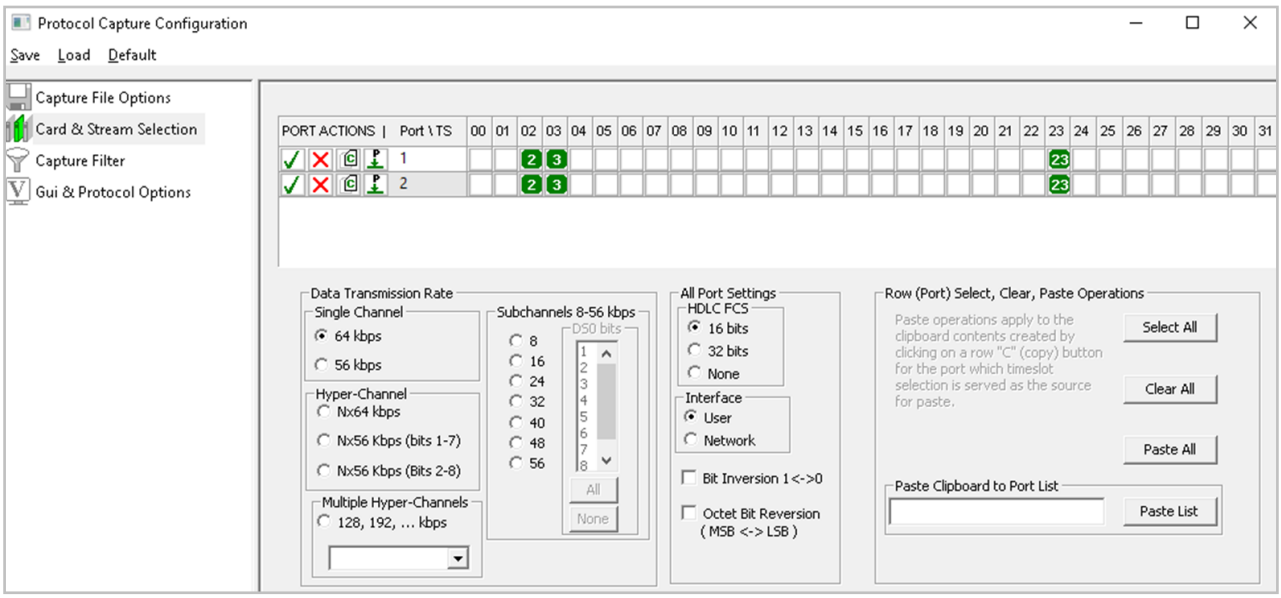
The analyzer displays Summary, Detail, and Hex Dump Views in different panes. The Summary View displays Device Number, Frame Number, Time, Length, C/R, SAPI, TEI,P/F, N(S),N(R), Func, CRV, Called and Calling No and so on. User can select a frame in Summary View to analyze and decode each frame in the Detail View. The Hex dump View displays the frame information in HEX and ASCII octet dump formats. 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 ISDN frames using either real-time or remote analyzers, and record all or filtered traffic into a trace file. The recorded trace file can be used for offline analysis or exported to a comma-delimited file, or ASCII file. Real-time capturing requires user to specify timeslots, bit inversion, octet bit reversion, user/network side, FCS, and data transmission rate. Recorded trace file can be played back on T1 E1 using the HDLC file Playback application.



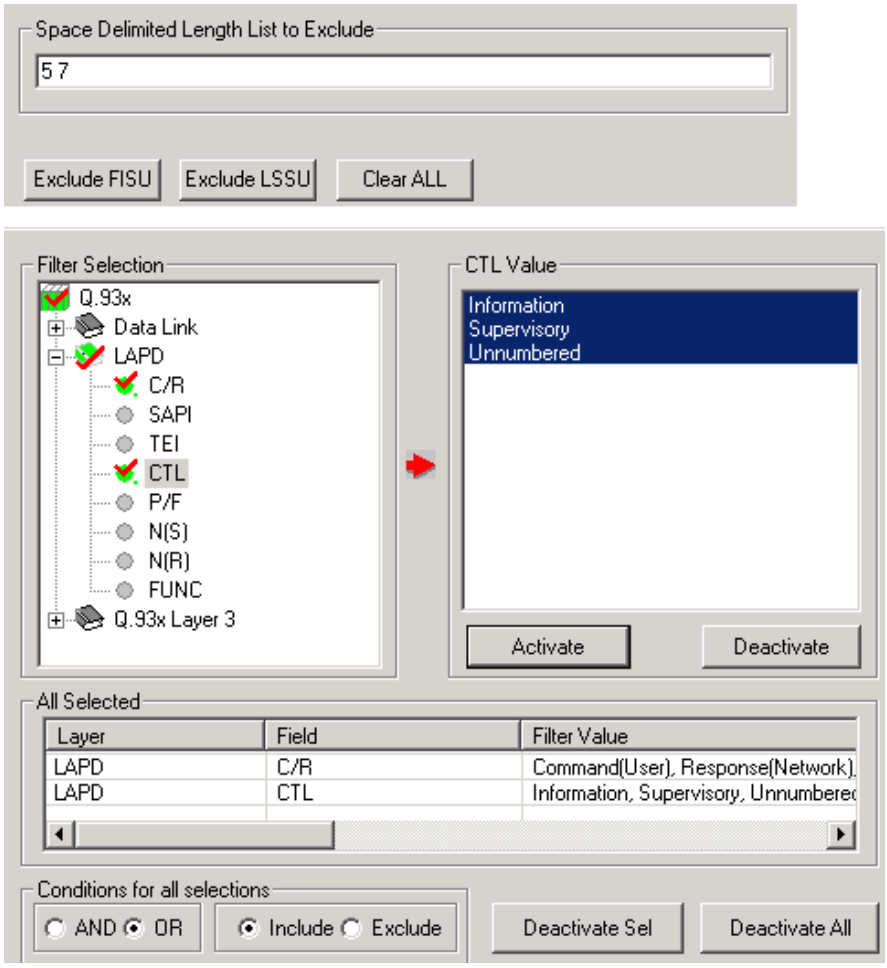
Stream / Interface Selection

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 ISDN 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 and also to automatically create search/filter criteria from the current screen selection.

The frames can also be filtered after completion of capture based on C/R, SAPI, TEI, CTL, different ISDN message types and more.

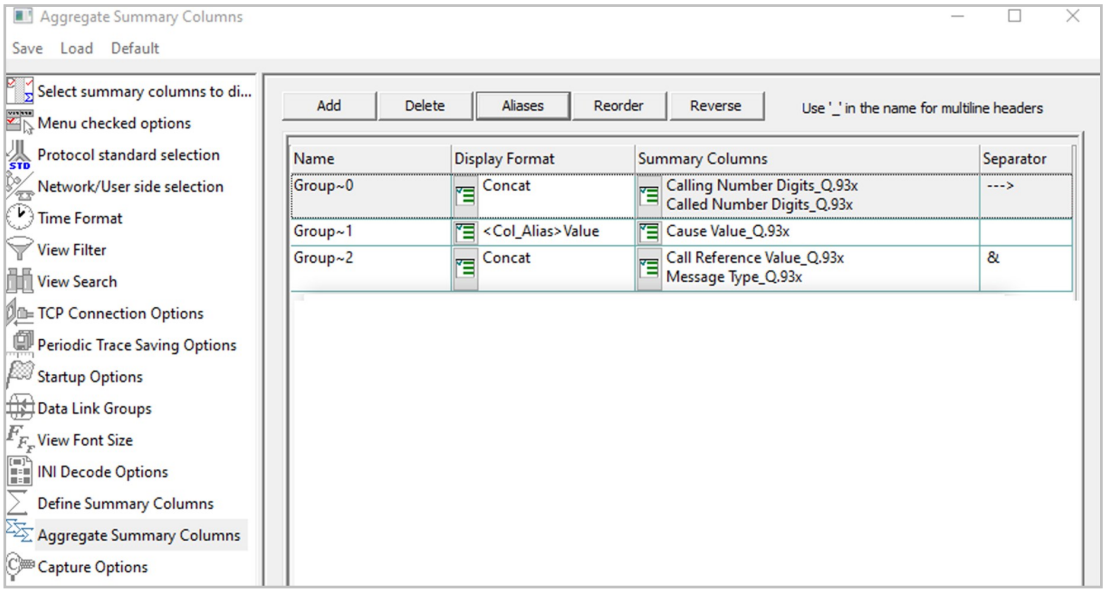


Real-time and Offline Filter

Aggregate Column Group

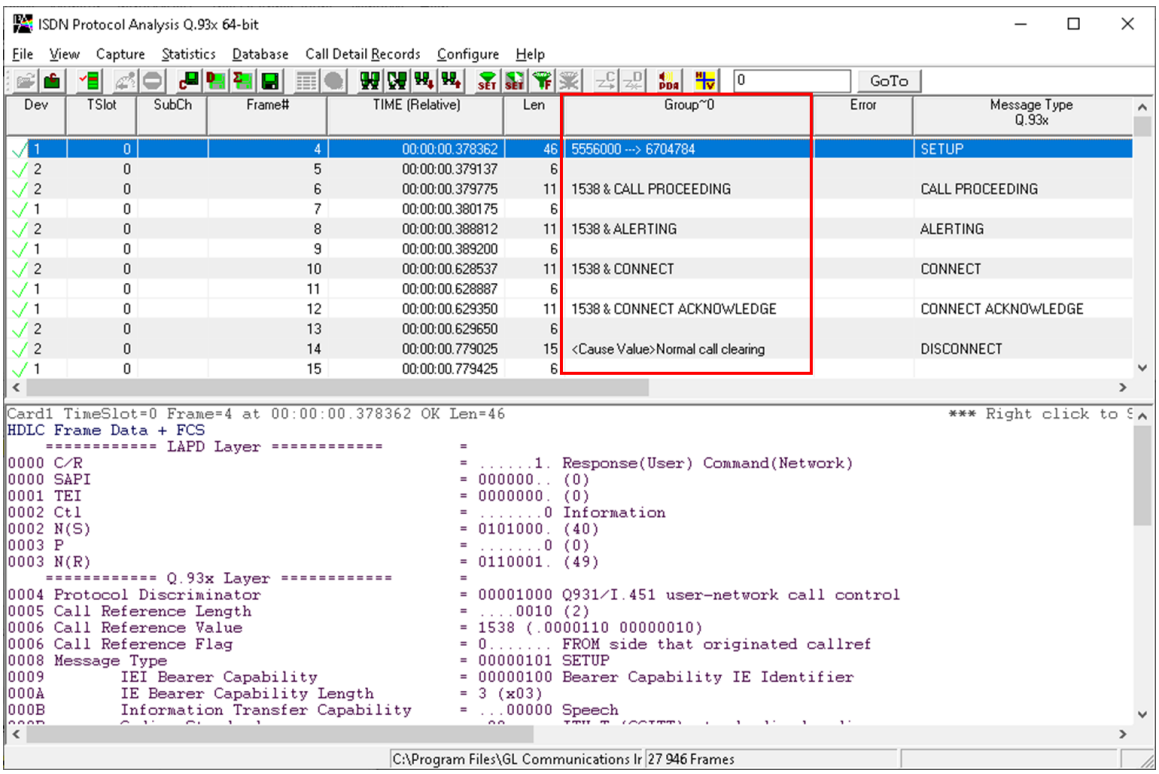
The enhanced feature of the protocol analyzer is aggregate column groups. The user can also create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results in an efficient way.

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.

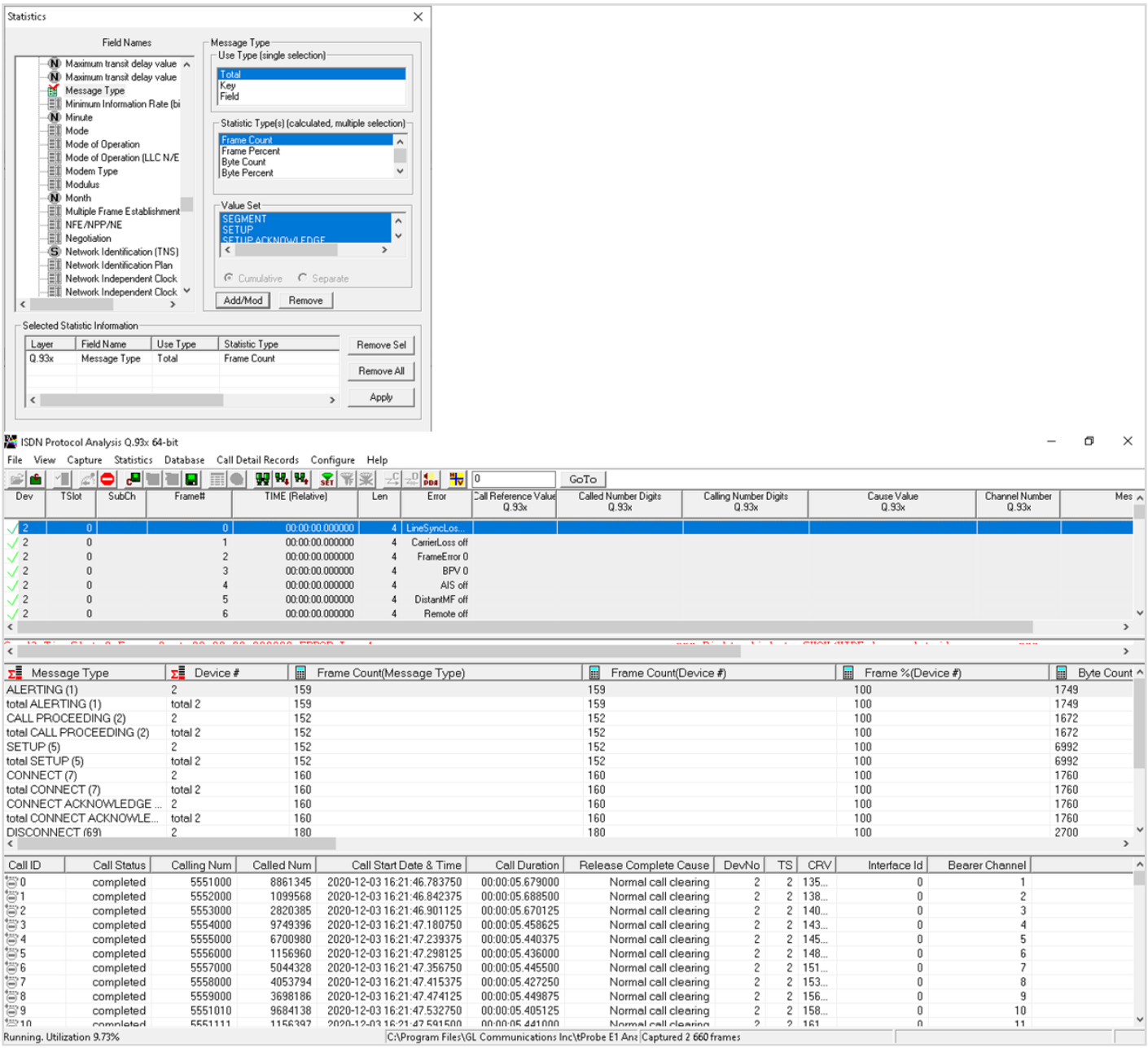


Display of Aggregate Column Group in Summary View

Call Detail Record and Statistics View

Important call specific parameters like Call Id, Calling No, Called No, Call duration, status of each call (i.e. Active/Completed), Device No, Timeslot, CRV, etc are calculated based on signaling messages and displayed in Call Detail Record View. Additionally, users are provided with the option to search a particular call detail record from the captured traces.

Various statistics can be obtained in statistics view to study the performance and trend in the ISDN network based on protocol fields and parameters.



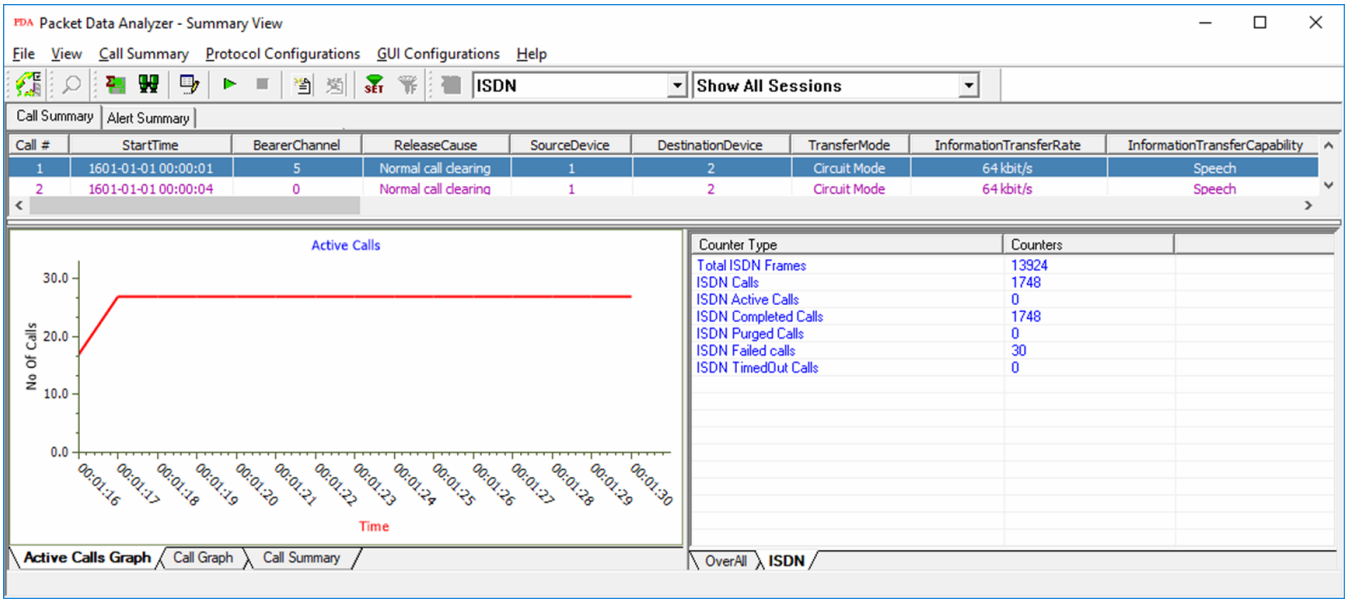
Statistics and Call Detail Record View

Detail Packet Analysis (PDA)

Packet Data Analysis (PDA) is an outstanding tool for live monitoring of signaling and traffic over TDM. Packet Data Analysis (PDA) is distributed with GL's ISDN, CAS, SS7, and GSM protocol analyzer. Allowing users to monitor live TDM networks including capture, analysis, and reporting of every call-in detail.

GL's Packet Analyzers can capture TDM traffic over different transmission lines, including T1, E1, T3, E3, and OC-3 STM-1 / OC-12 STM-4. PDA then processes the captured frames, identifies, and segregates calls based on signaling parameters to generate reports.

Performance metrics for each call includes Caller & Callee id information, call duration, status, call-initiated time, call established time, call stop time, call terminator, call failure reason, and total signaling frames. Graphs are provided for key values to give a pictorial representation of the statistics.



Call Capture Option with PDA

Supported Protocol Standards

The supported protocol standards in ISDN analyzer are Q.93x, 4ESS, 5ESS, ETSI 300-102, Bell NI2, DMS-100, DMS-250, QSIG ETSI, ISDN ANSI, DPNSS, DASS2, ARINC 746, QSIG ECMA, and Nation ISDN PRI.

Supported Protocols	**Specification Used**
LAPD	CCITT Q.920/921
Q.931	ITU-T Q.931 Q.932(Facility IE) / Q.955.3 (MLPP Procedures)
4ESS	ISDN PRI (TR-41449, TR41459 and 235-900-342)
5ESS	ISDN PRI (Lucent Tech - 5ESS 2000)
ETSI (Euro ISDN)	ETS 300 - 102
BELL NI2 (Bellcore National ISDN-2)	ISDN PRI (Bell Core SR-NWT-002343)
QSIG-ETSI	ETS 300 196-1: August 1993 / ETS 300 102-1: December 1990
ANSI	ANSI T1.607-1998, ANSIT1.619-1992 (R2005) and T1.619a-1994(R2007) (MLPP Procedures)
DASS2	BTNR 190:June 1992
DPNSS	ND1301:2001/03
ARINC-746	ARINC CHARACTERISTIC 746-5
QSIG ECMA	Standard ECMA-143 4th Edition - December 2001
Nortel's switch DMS 100	NIS-A2111-1
Nortel's switch DMS 250	NIS-A2111-4
National ISDN PRI CPE	Telcordia – SR-4994

Buyer's Guide

Item No	Product Description
XX100	T1 E1 Real-Time ISDN Protocol Analyzer
XX101	Call Capture Option for ISDN Protocol with PDA
OLV100	Offline/Remote ISDN Protocol Analyzer

Item No	Related Software
XX090	HDLC Analysis & Simulation Software (T1 E1)
XX105	ISDN Emulator (T1 or E1)
XX629	ISDN Emulator (T1 or E1) w/ command line interface
XX648	Message Automation and Protocol Simulation (MAPS™) for ISDN

Item No	Related Hardware
PTE001	tProbe™ Dual T1 E1 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

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

For more details refer to PRI-ISDN Protocol Analyzer webpage.