CDMA2000 Protocol Analyzer

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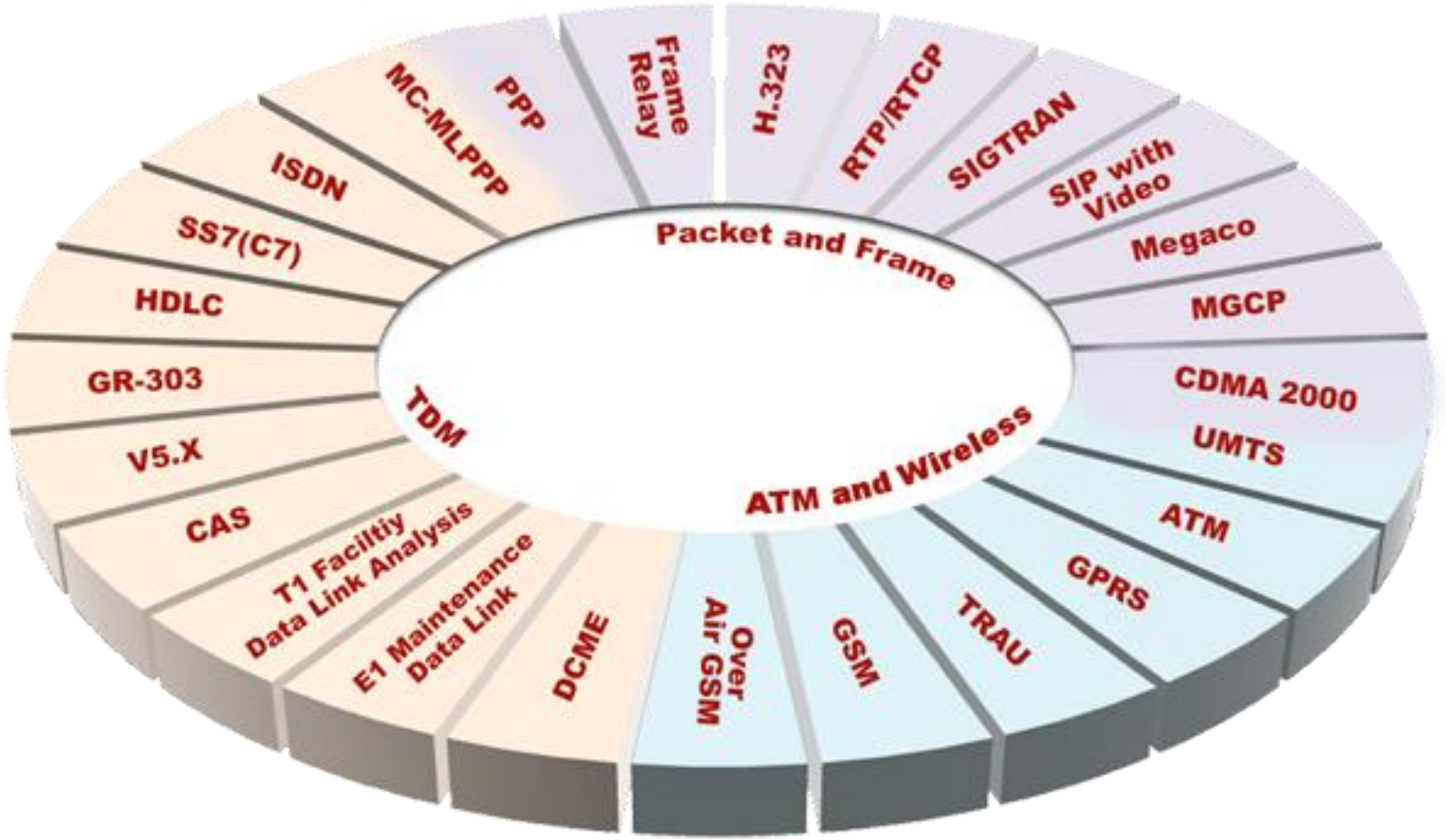
TDM, Wireless, and VoIP Protocol Analysis

- GL Communications provides a host of protocol analyzers for testing a variety of protocols
- Analysis may be done both in real-time and off-line



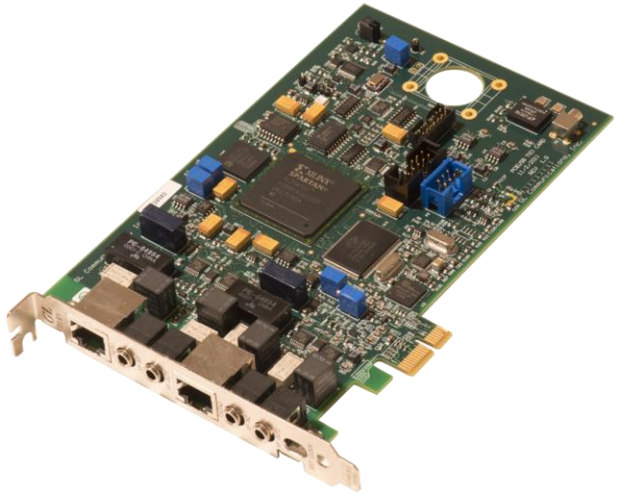
Supported Platforms

Front Panel

Back Panel

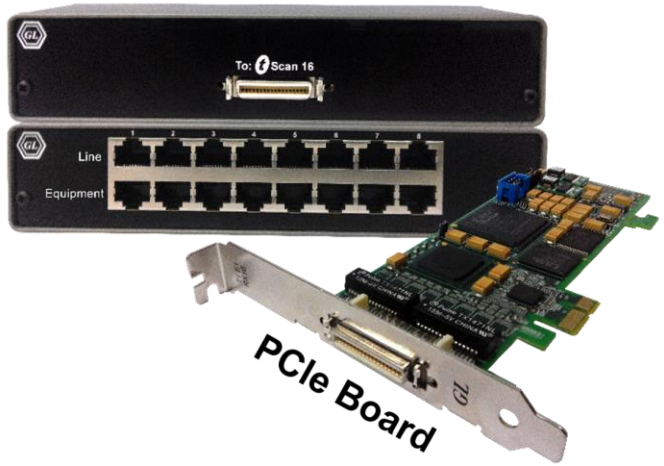
tProbe™ - Portable USB based T1 E1 VF FXO FXS and Serial Datacom Analyzer

Quad / Octal T1 E1 PCIe Card



Dual T1 E1 Express (PCIe) Board

tScan16™ with 16-port T1 E1 Breakout Box



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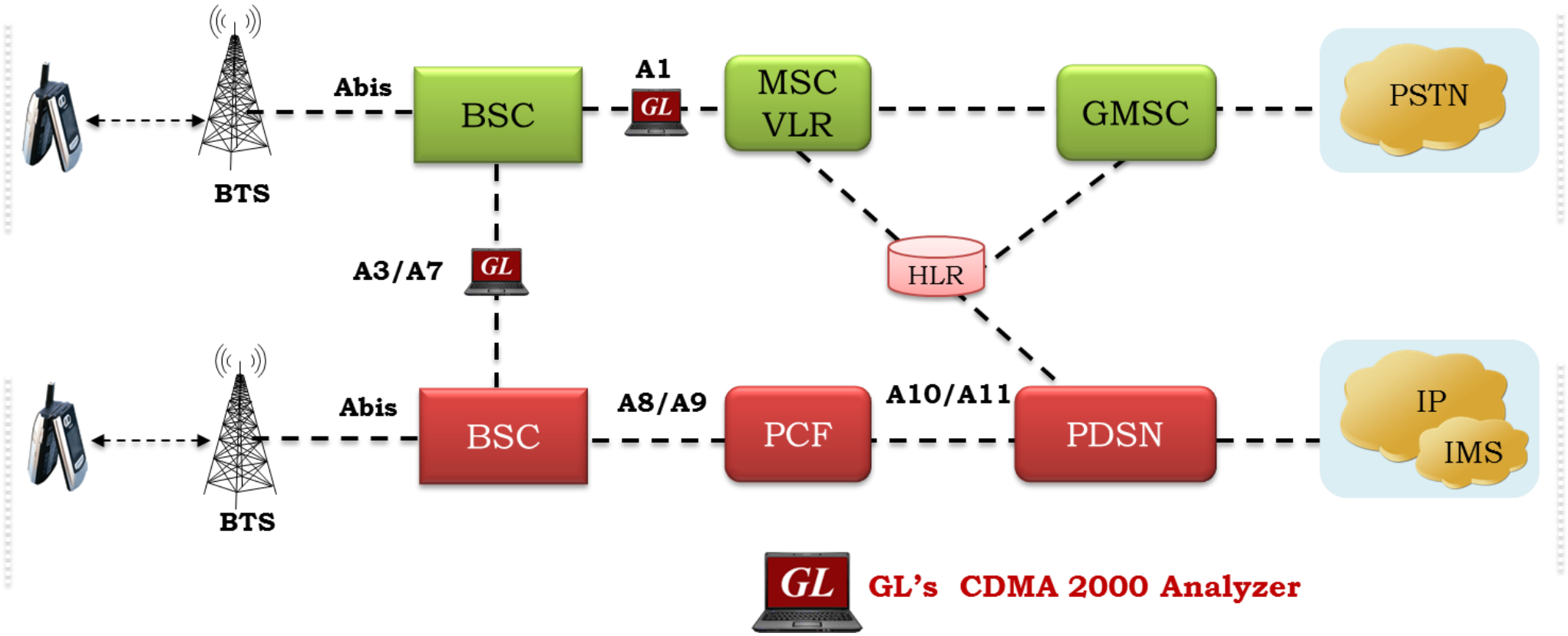
Overview

GL's CDMA analyzer is used to analyze and view protocols across A, Ater, Aquinter, and Aquater signaling interfaces



Supported Protocols

- BSAP, MTP2 (ITU), MTP3 (ITU)
- MTP3 (ANSI), SCCP Management
- SCCP ITU, SCCP ANSI
- Test and Network Management Messages (ITU)
- Test and Network Management Messages (ANSI)

Available Standards	Supported Protocols	Specification Used
A1 Interface (ANSI)	BSAP	3GPP2 A.S0014-A, Version 2.0.1 July 2003
A1 Interface (ITU)	MTP2 (ITU)	ITU-T Q.703
A3/A7 Interface	MTP3 (ITU)	ITU-T Q.704
	MTP3 (ANSI)	ANSI T1.111-1996
	SCCP Management	ITU-T Q.711 (07/96)
	SCCP ITU	ITU-T Q.711 to Q.714
	SCCP ANSI	ANSI T1.112
	Test & Network Management Messages (ITU)	ITU-T Q.703, Q.704
	Test & Network Management Messages (ANSI)	ANSI T1.111.4, ANSI T1.111.7
	A3/A7 Interface	3GPP2 A.S0015-C, Version 1,0 February2005
	ATM	ITU-T I.361
	AAL	ITU-T I.363
	SSSAR	ITU-T I.366.1
	AAL2	Class B (ITU-T I.363.2)
	AAL5	Class C & D (ITU-T I.363.5)
	IP	RFC 791
	TCP	RFC 793
	MAC	IEEE 802.3
	IP	RFC 791
	TCP	RFC 793
	UDP	RFC 768

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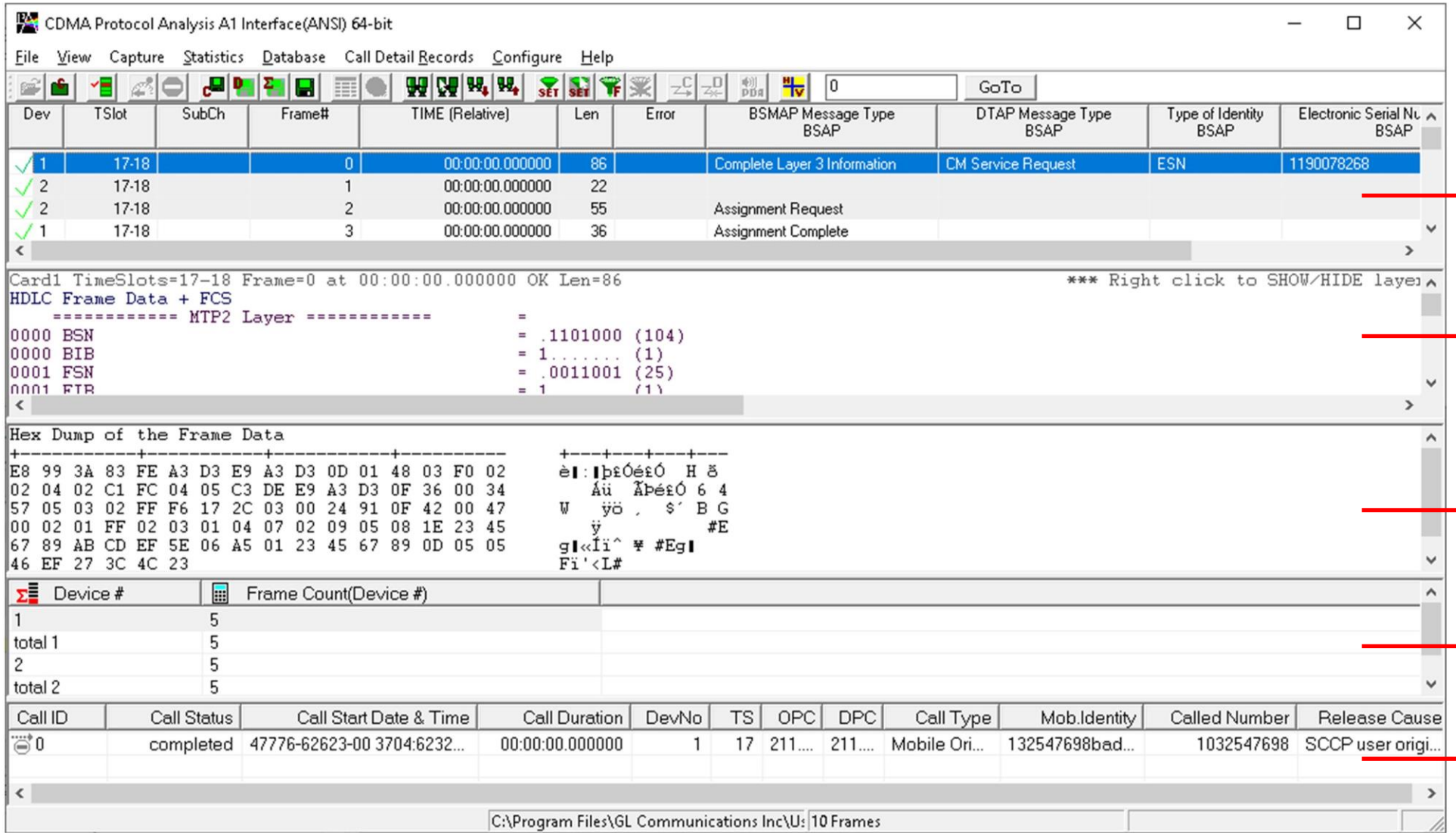
Features

- Summary View displays Device Number, Time Slots: Sub channels, Frame number, Time, Frame length, and etc in a tabular format
- Summary view (Call Quality Matrix) displays complete summary of call information in graphical format, along with a summary of alerts
- Detail View displays packet by packet statistics for particular call information in 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
- Advanced filtering and search based on any user selected protocol fields
- Allows the user to create search/filter criteria automatically from the current screen selection
- Remote monitoring capability using GL's Network Surveillance System

Features (Contd.)

- For A1 interface, streams can be captured on the selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth
  - Frames captured can be filtered real-time based on length of frames (FISSU – Length as 5 and LSSU – Length as 7) can be set
  - Data transmission rate starting from 8kbps to N*64kbps is supported
  - Timeslot's selection can be contiguous or non – contiguous
  - Supports decoding of frames with FCS of 16 bits and 32 bits, or none
  - Call Detail Recording feature includes data link groups that help in defining the direction of the calls in each network and form logical groups comprised of unidirectional (either 'Forward' or 'Backward') data links
- For A3 A7 interface, Streams may be captured on the selected time slots (contiguous or non-contiguous) and on full bandwidth
  - Captures, decodes, filters, and reassembles (with or without Inverse Multiplexing option) AAL-2 and AAL-5 frames in real-time, from within the ATM cells according to user defined VPI/VCI
  - Real-time capturing requires user to specify timeslots, bit inversion, octet bit reversion, user/network side, ATM mapping, scrambling, and inverse multiplexing options
  - Streams may be captured on the selected time slots (contiguous or non-contiguous) and on full bandwidth
  - Unscrambling of ATM cells based on SDH X43 + 1 algorithm

Real-time Analysis



Summary View

Detail View

Hex Dump View

Statistics View

Call Trace View

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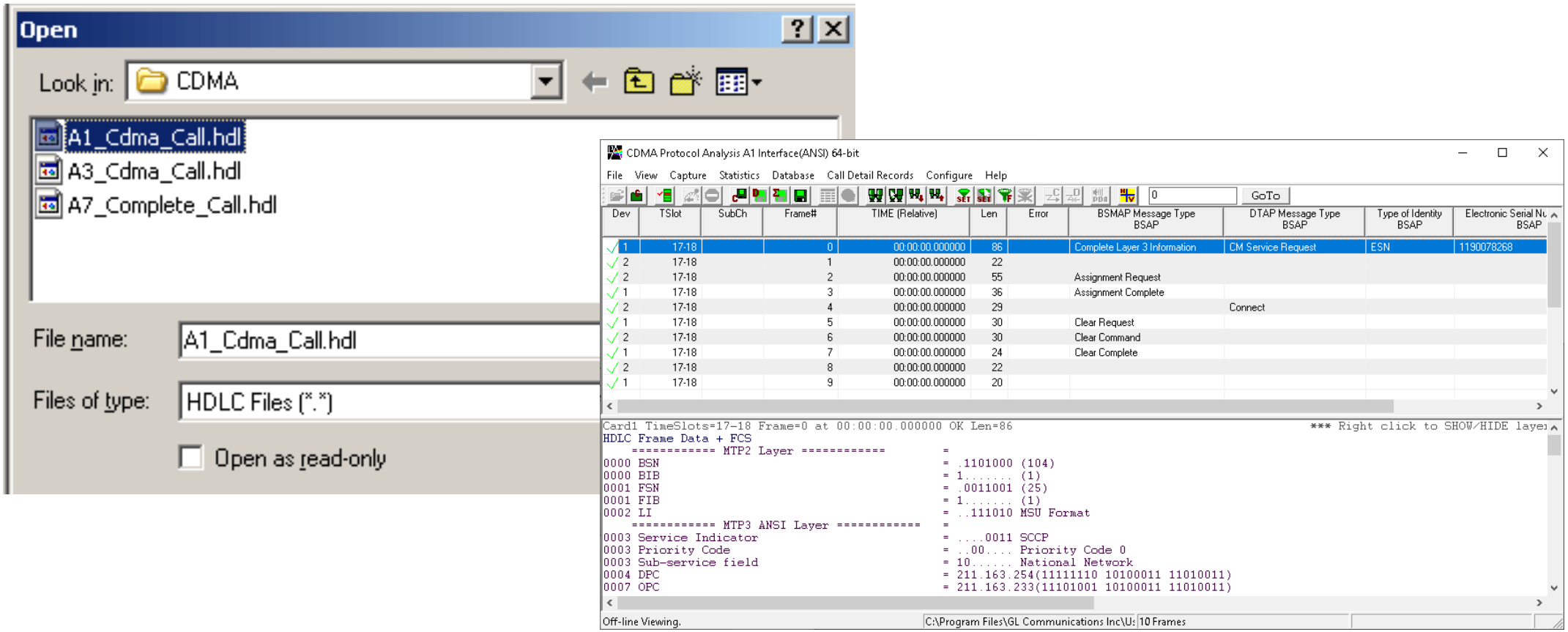
Different Views

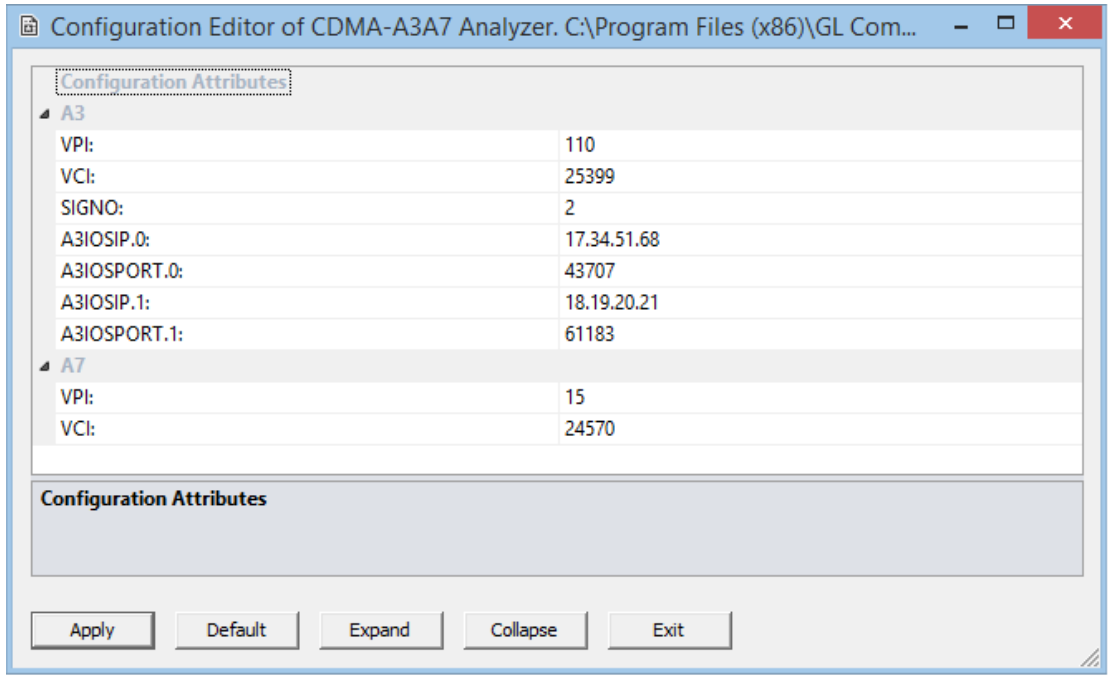
- Summary View: This pane displays the columns that contain Card Number, Timeslots, Frame Number, BSMAP Message Type, DTAP Message Type Frame Error Status, and more in a tabular format
- Detail View: This pane displays in detail about a frame in order to analyze and decode by selecting it in the summary view
- Hex Dump View: This pane displays the frame information in HEX and ASCII format
- Statistics View: This pane displays various statistics that are calculated based on the protocol fields

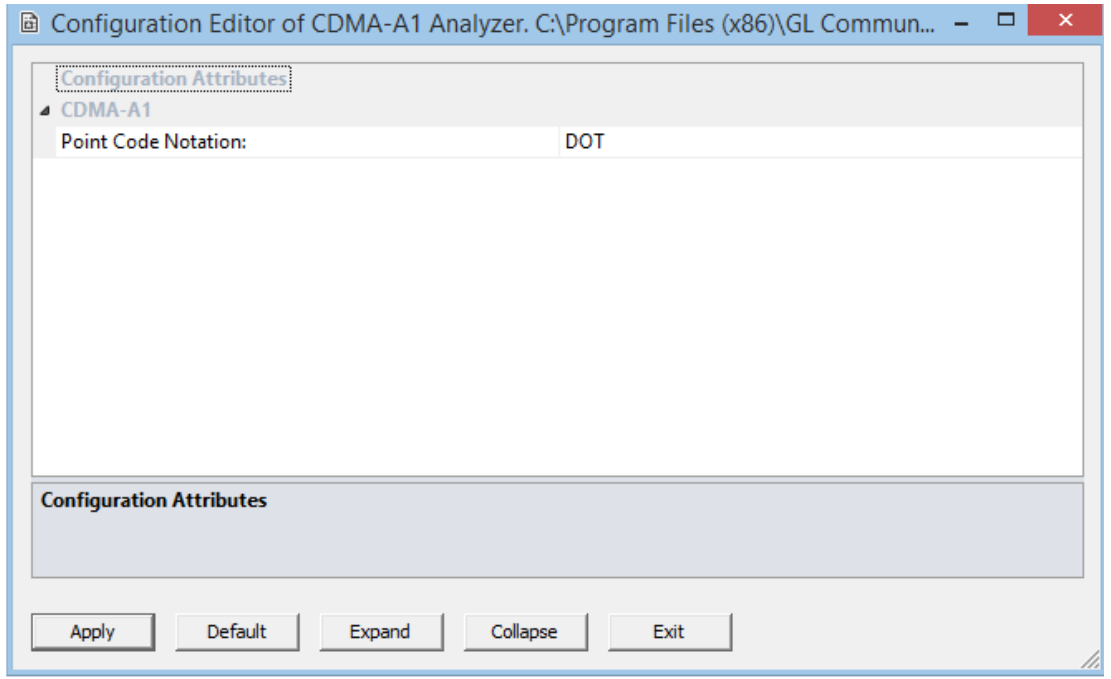
Offline Analysis

- Off-line analysis is equivalent to capturing a file in pre-defined timeslots
- Captured frames or only the filtered frames can be exported to *.HDL file for the further off-line analysis
- Trace file for offline analysis can be loaded either through analyzer GUI or through simple command-line arguments



Decode Settings





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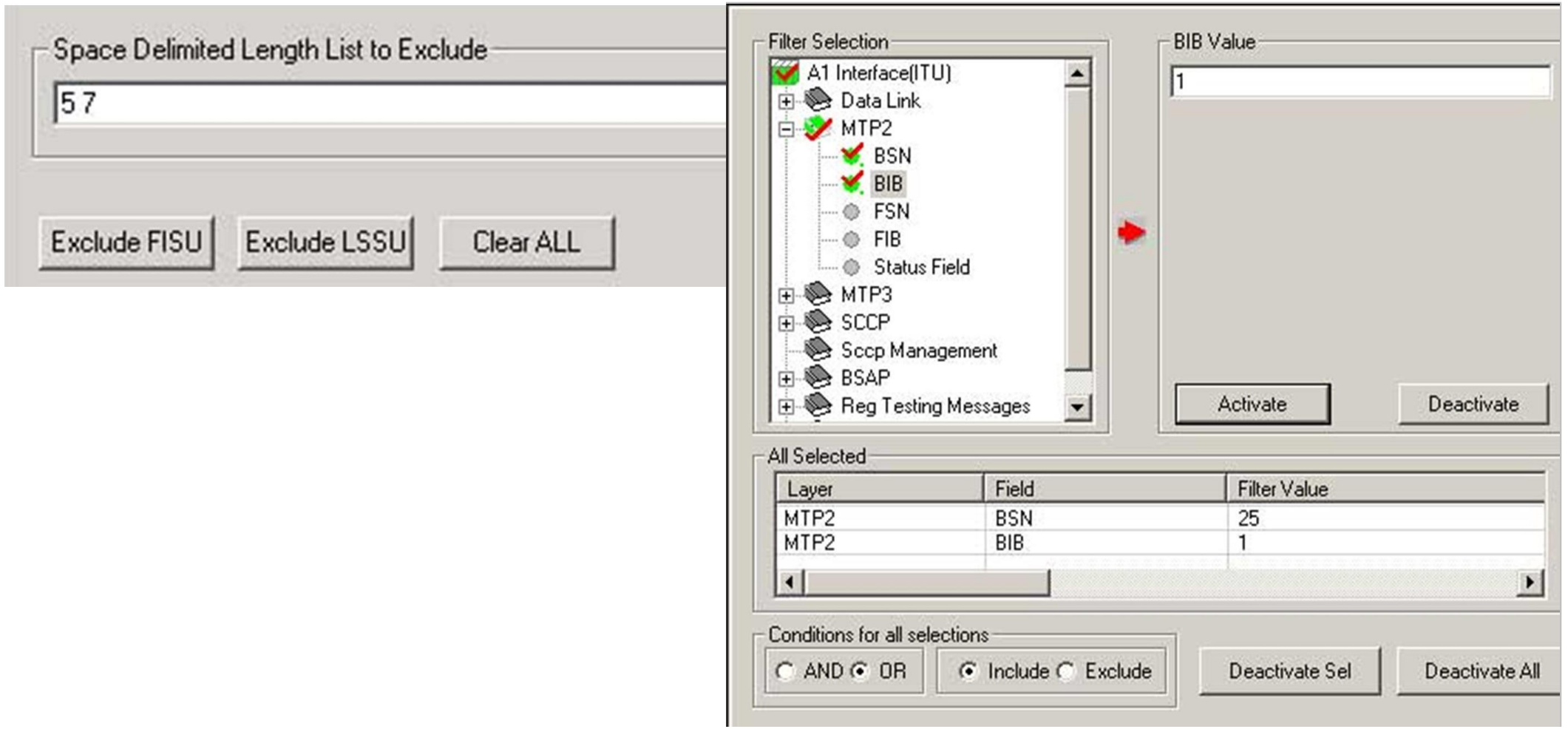
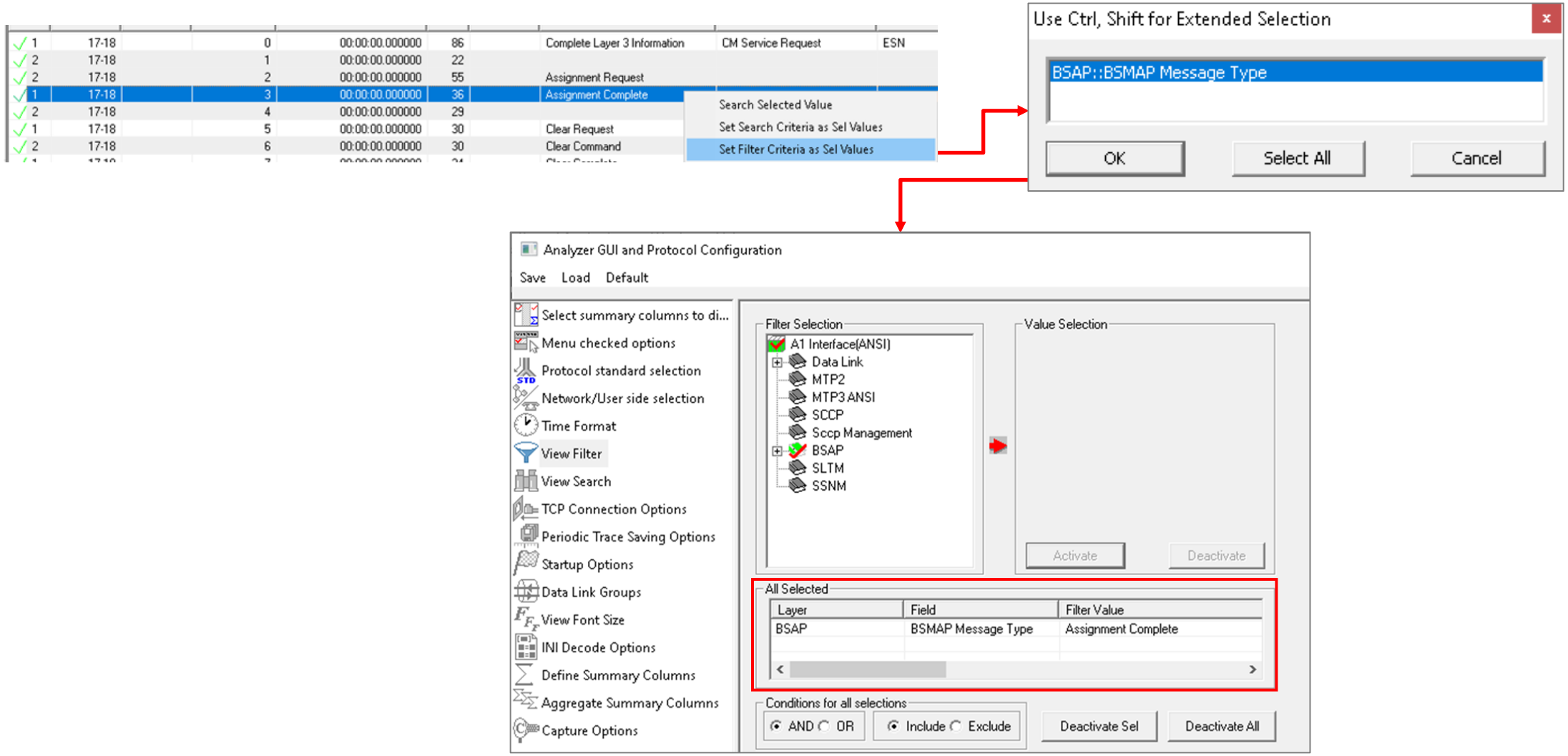
Filtering and Search

- Isolates required frames from all frames in real-time, as well as offline
- For A1, real-time capturing filter based on length of frames can be set. For A3 and A7 interfaces, users can also specify custom VPI, VCI, and PT type values to filter and reassemble frames during real-time capture



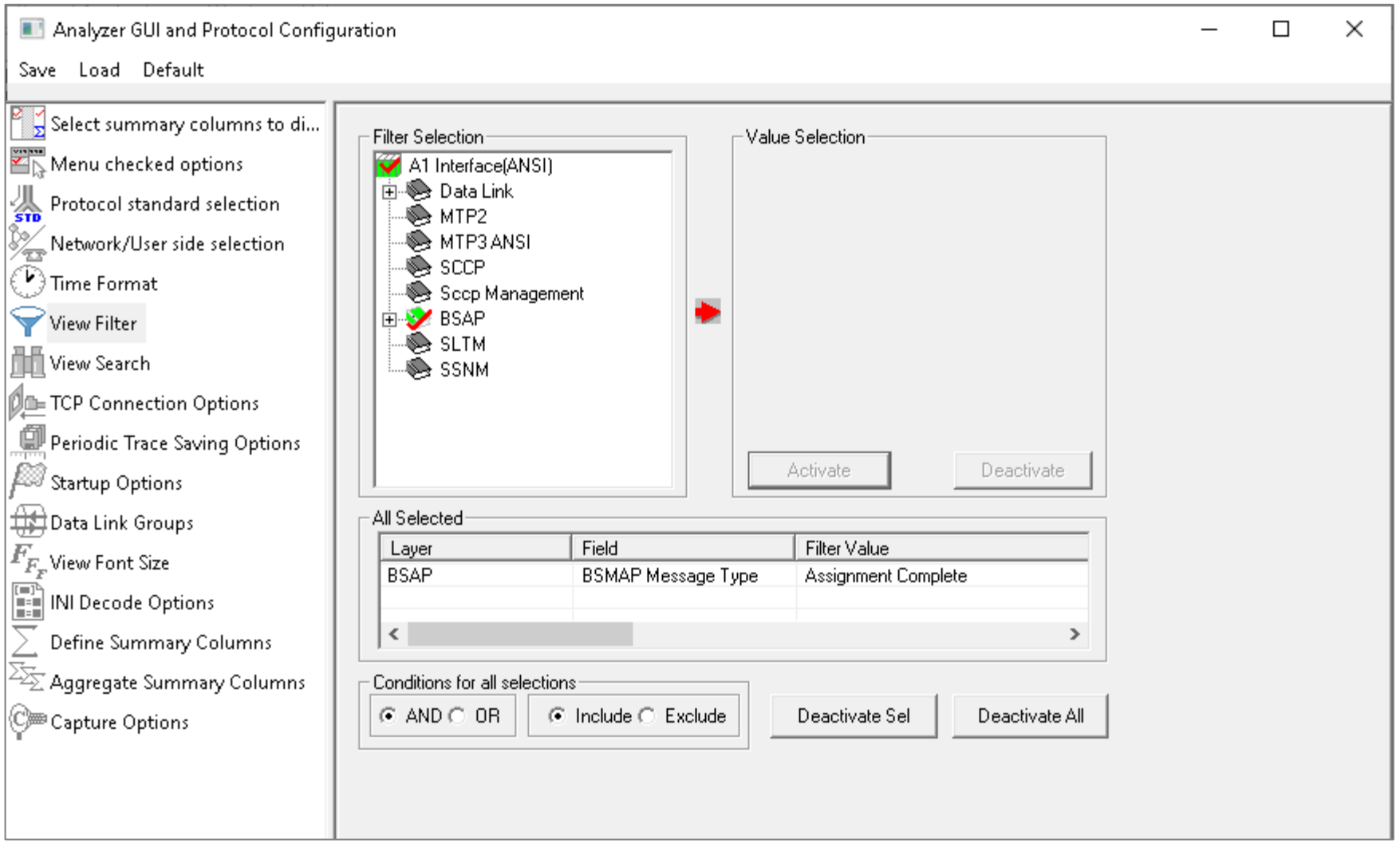
Filtering Criteria From Screen Selection

- Allows the user to create filter criteria automatically from the current screen selection



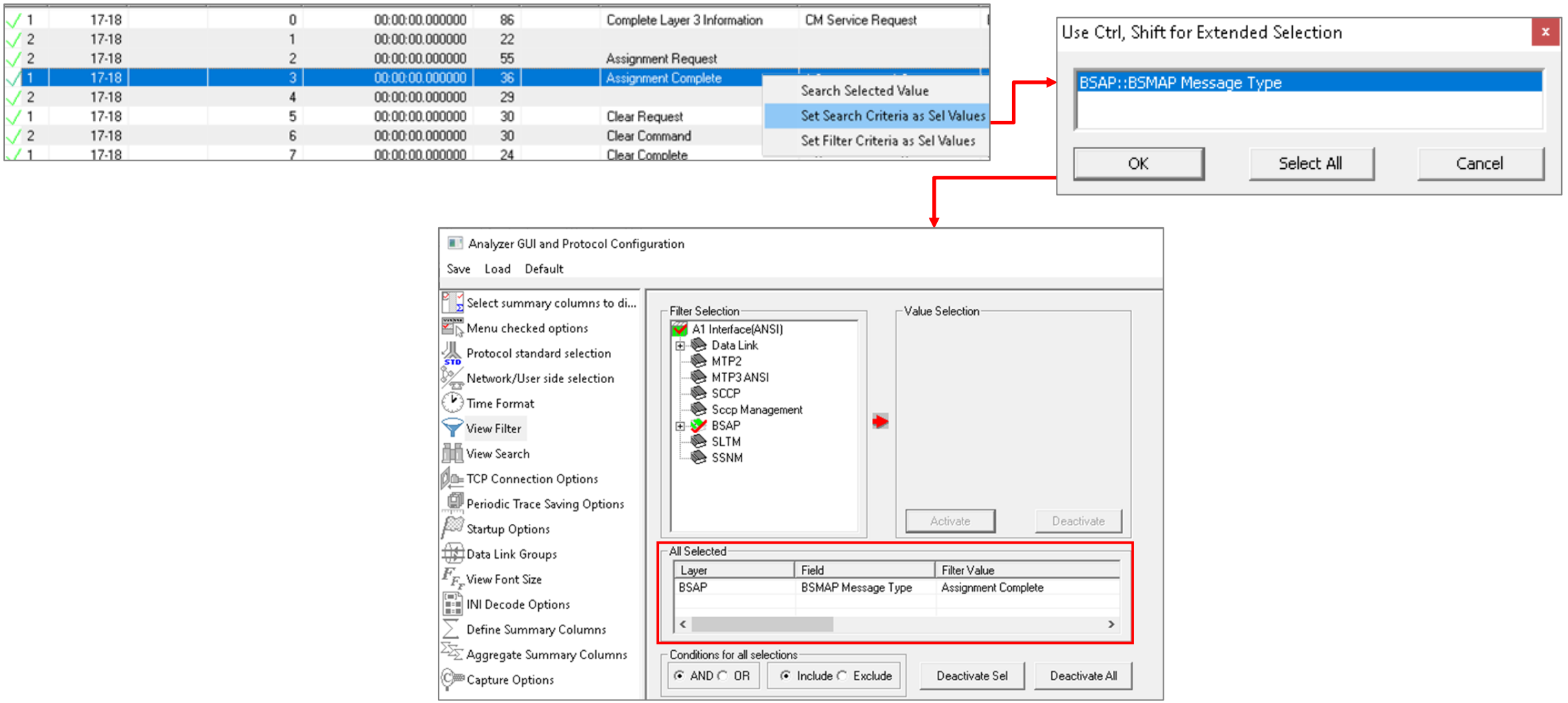
Search Options

- Search features helps users to search for a particular frame based on specific search criteria



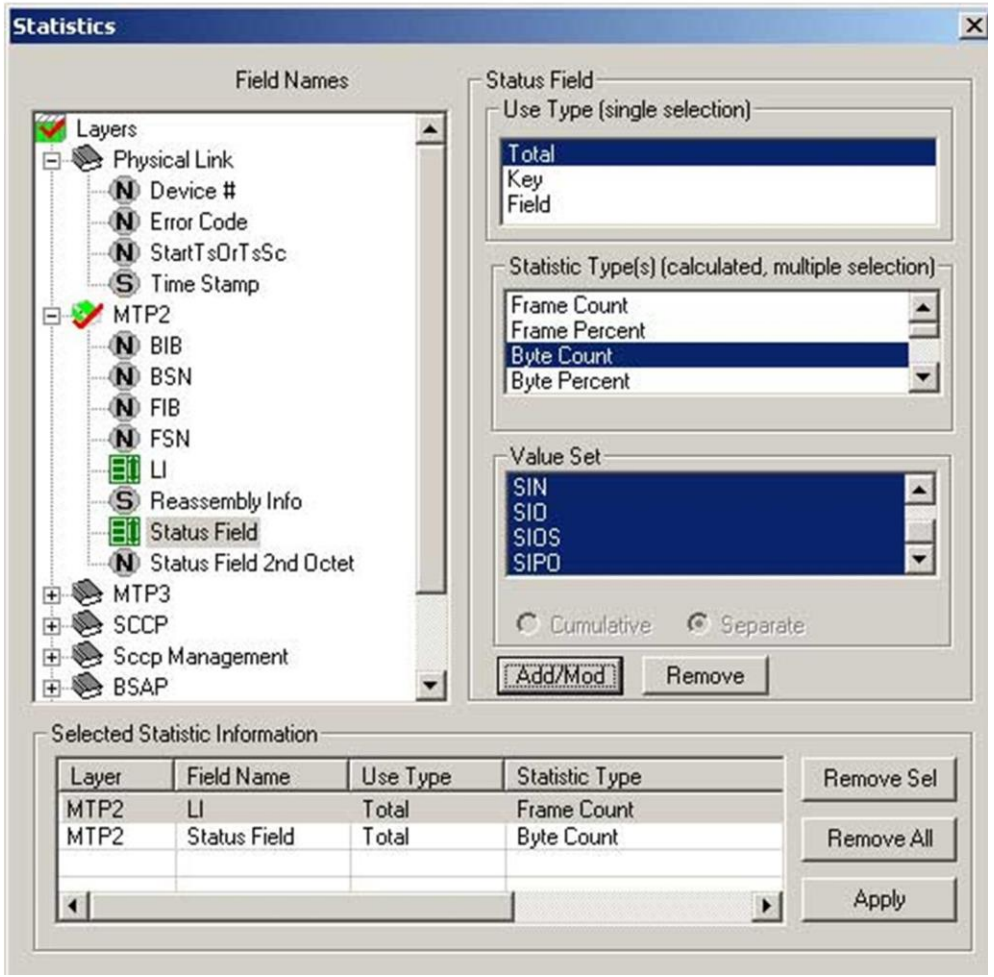
Search Criteria From Screen Selection

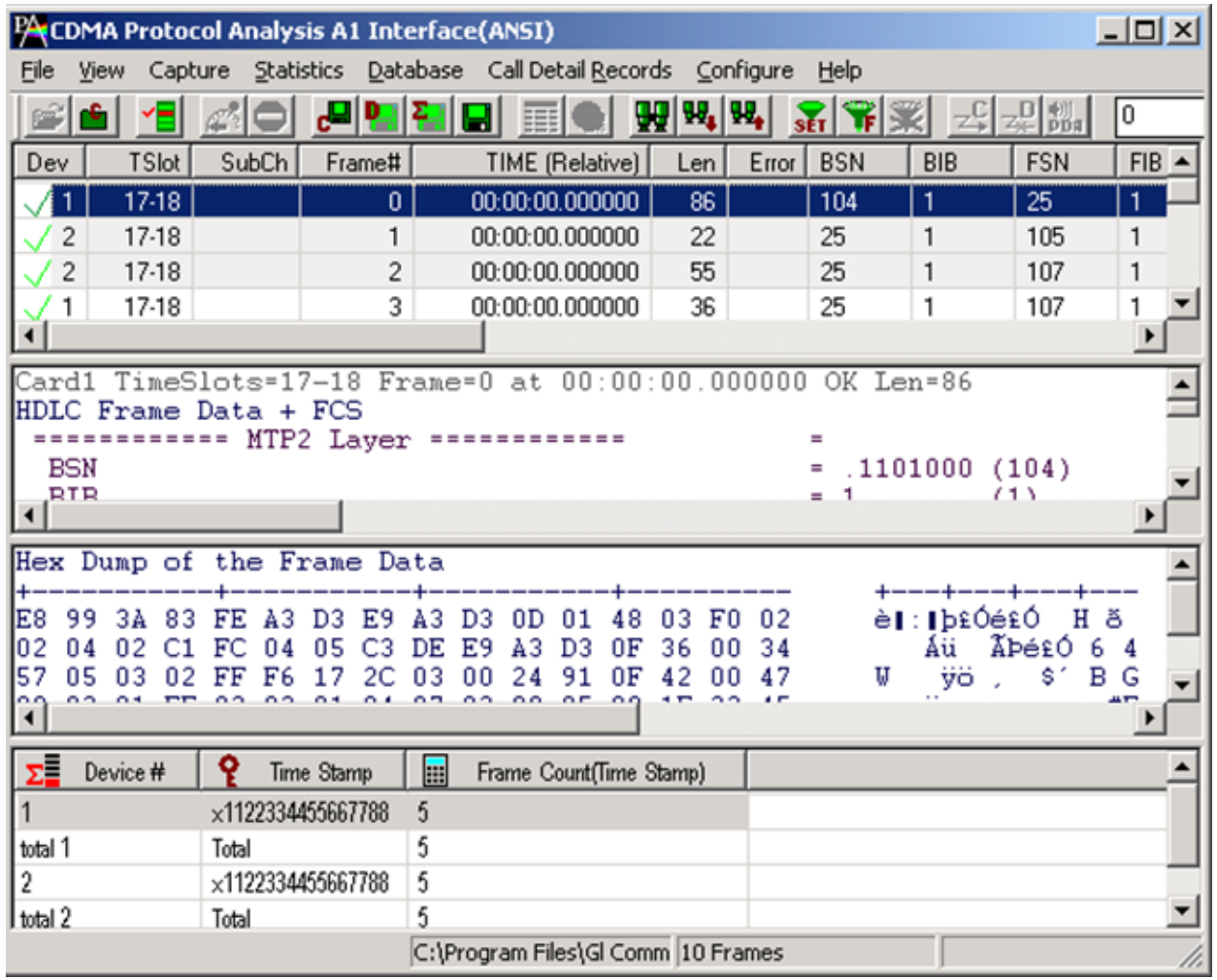
- Allows the user to create search criteria automatically from the current screen selection



Statistics

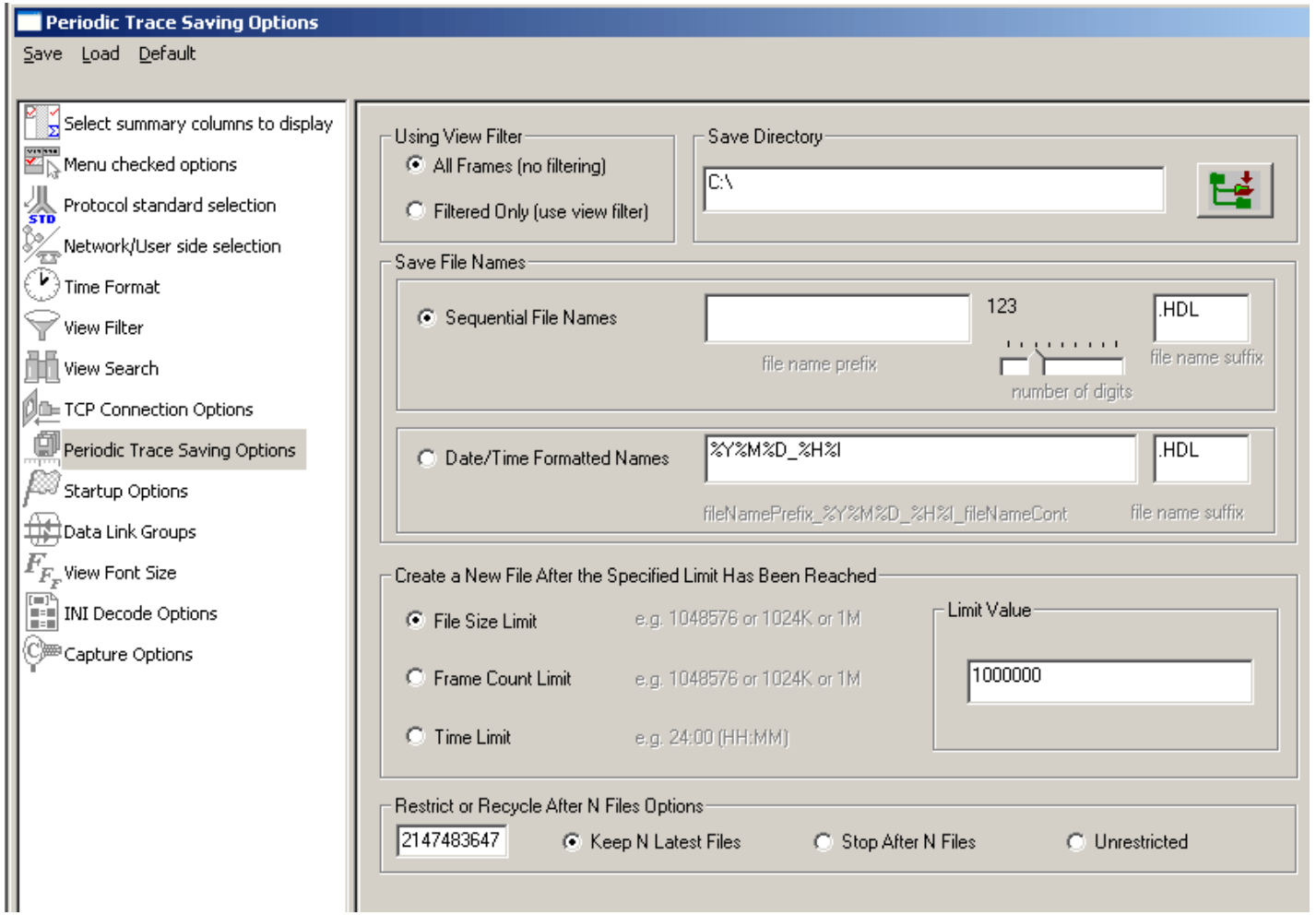
- Statistics is an important feature available in CDMA2000 analyzer and can be obtained for all frames both in real-time as well as offline mode





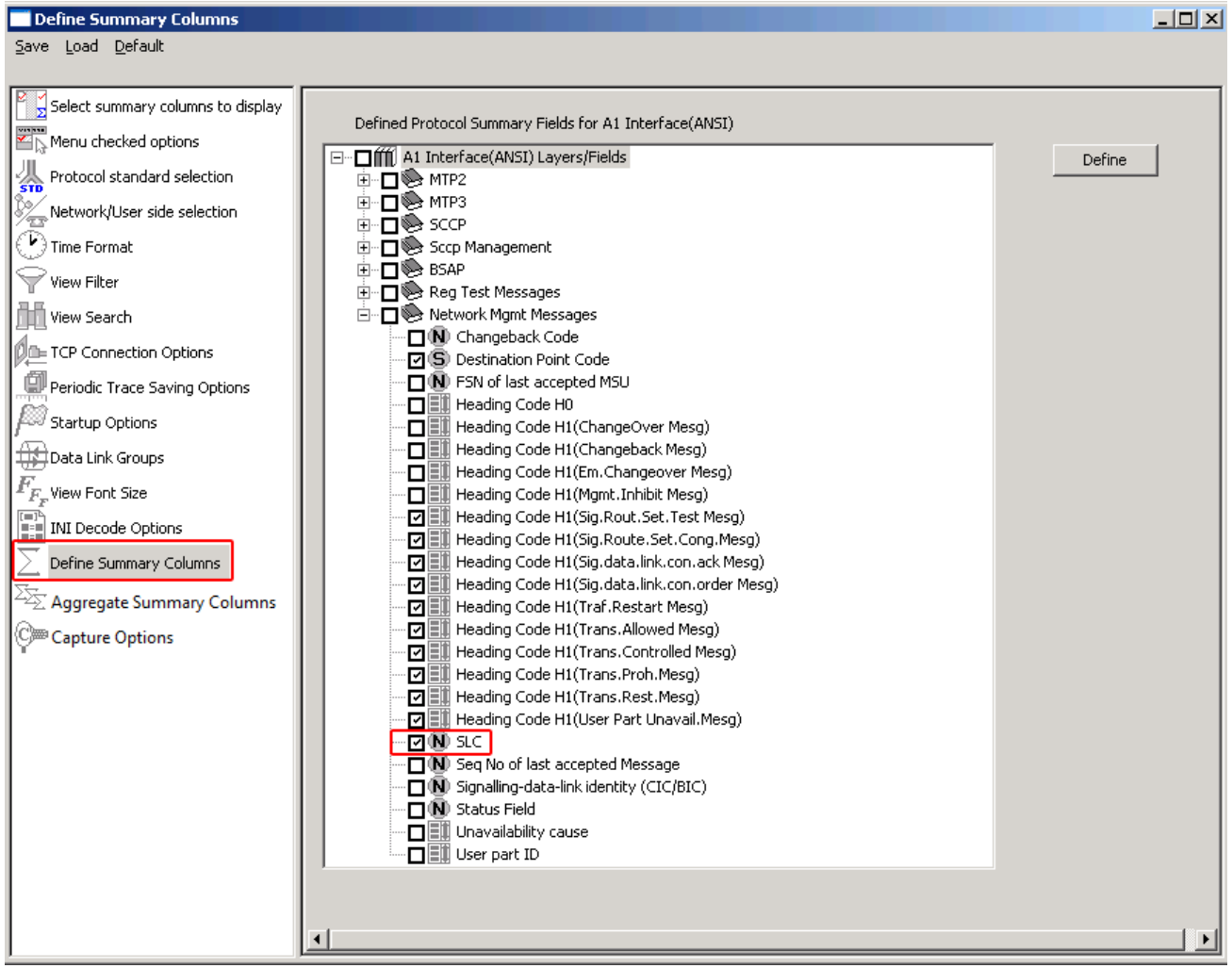
Saving a File

- Captured trace files can be controlled by saving the trace using different conventions such as –
  - ➢ Trace files with user-defined prefixes
  - ➢ Trace file with date-time prefixes
  - ➢ Slider control to indicate the total number of files, file size, frame count, or time limit



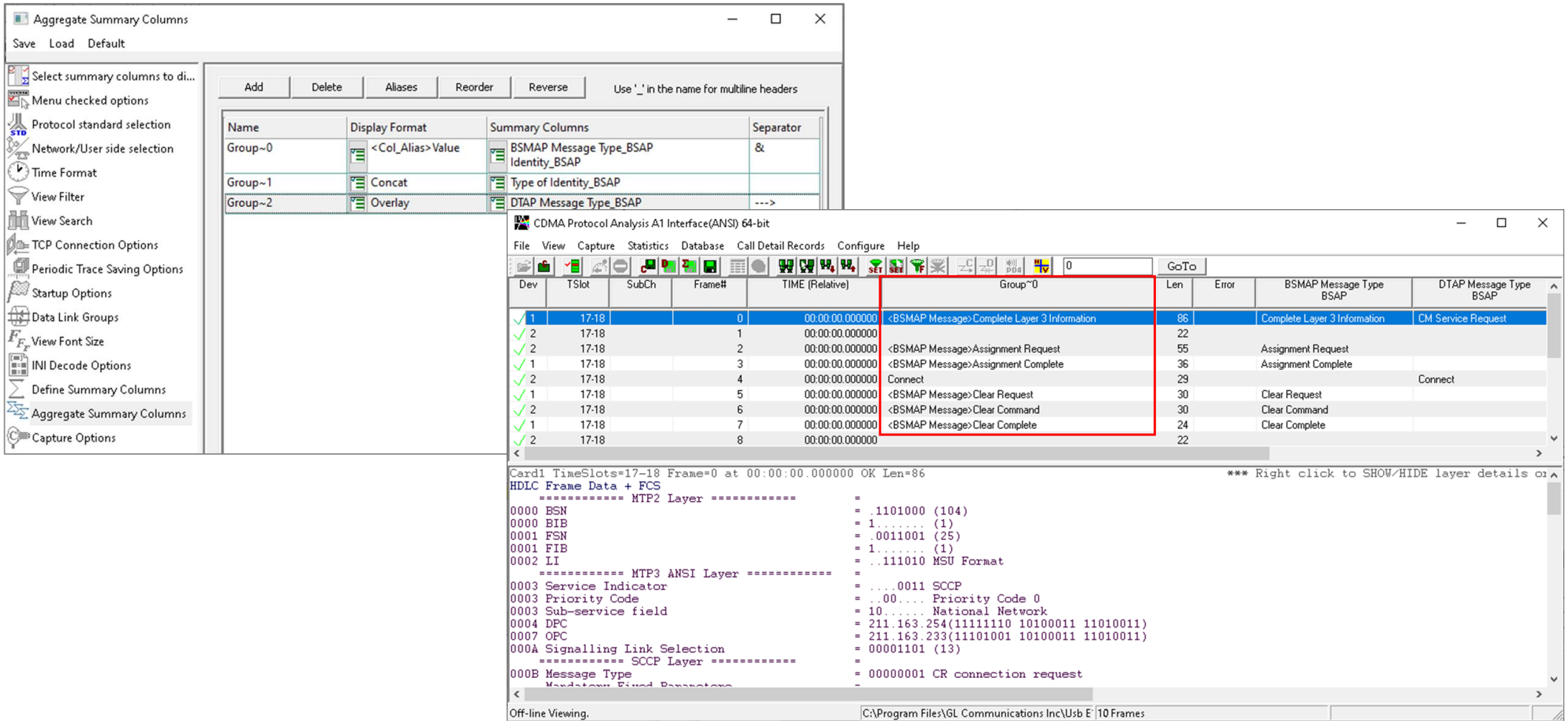
Define Summary Columns

- Required protocol fields can be added through Define summary column option
- User can remove the protocol field which is not required



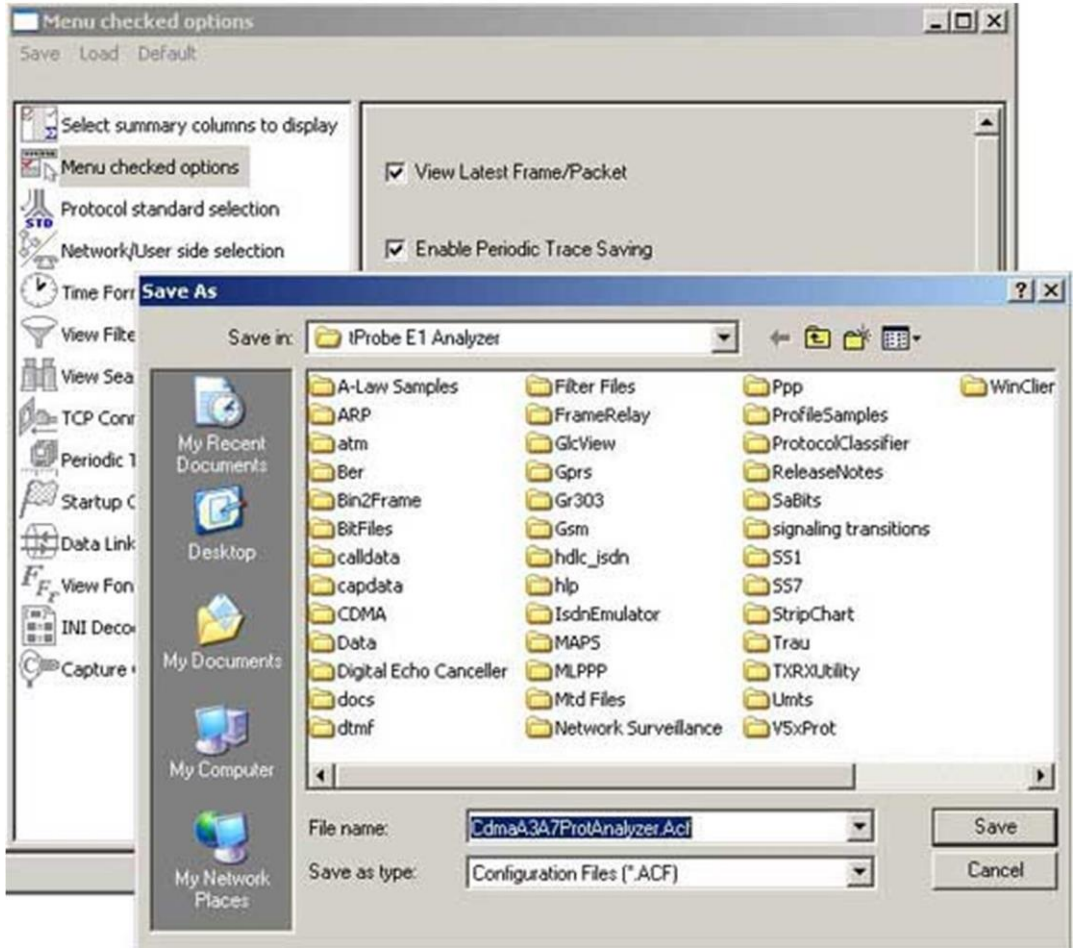
Aggregate Summary Group Column

- The user can create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results efficiently



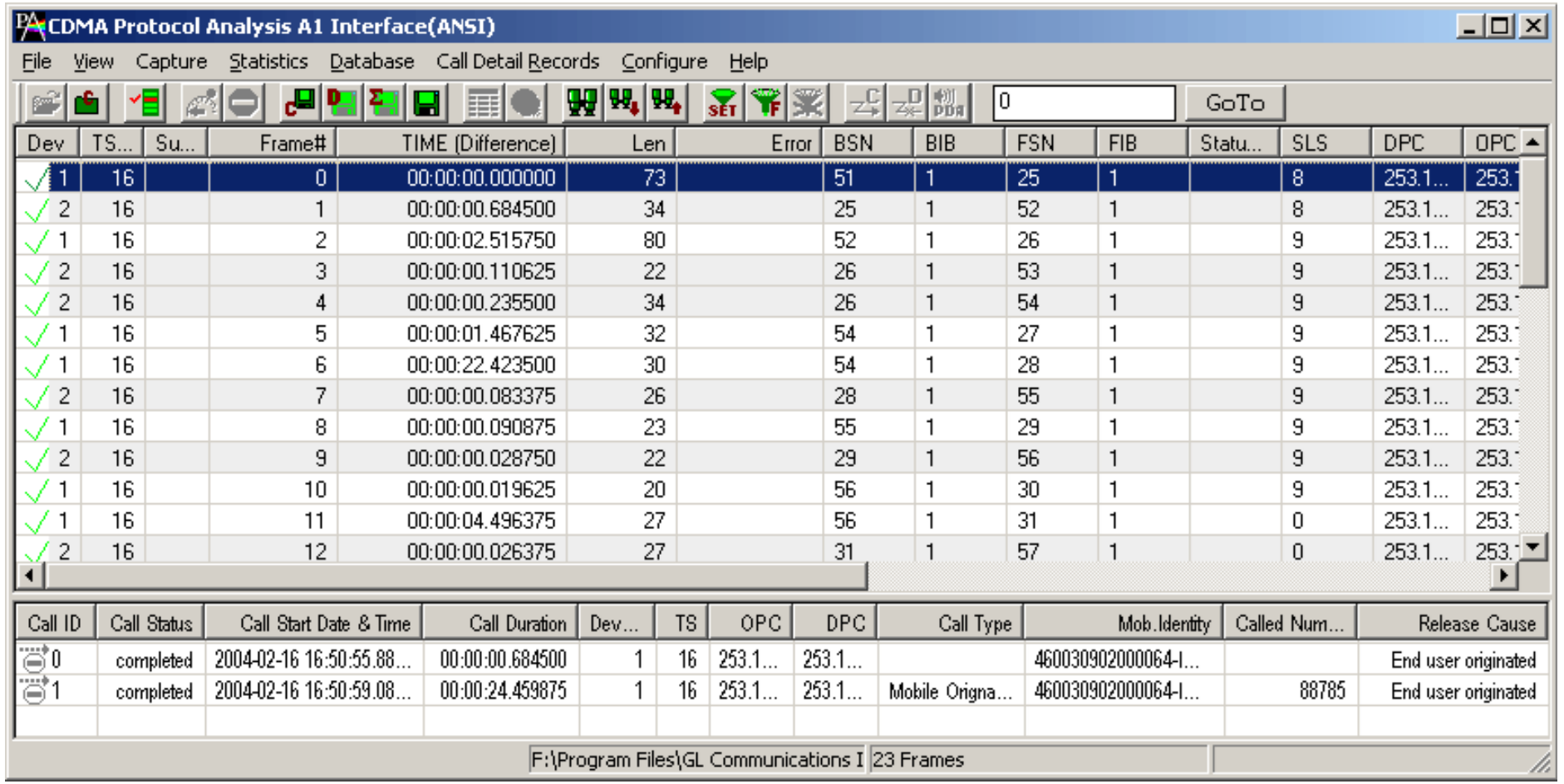
Save/Load All Configuration Settings

- Protocol Configuration window provides a consolidated interface for all the settings required in the analyzer such as protocol selection, filter criteria, search criteria, and so on
- Configuration settings can be saved to a file, loaded from a configuration file, or user may just revert to the default values using the default option



Call Detail Record (CDR)

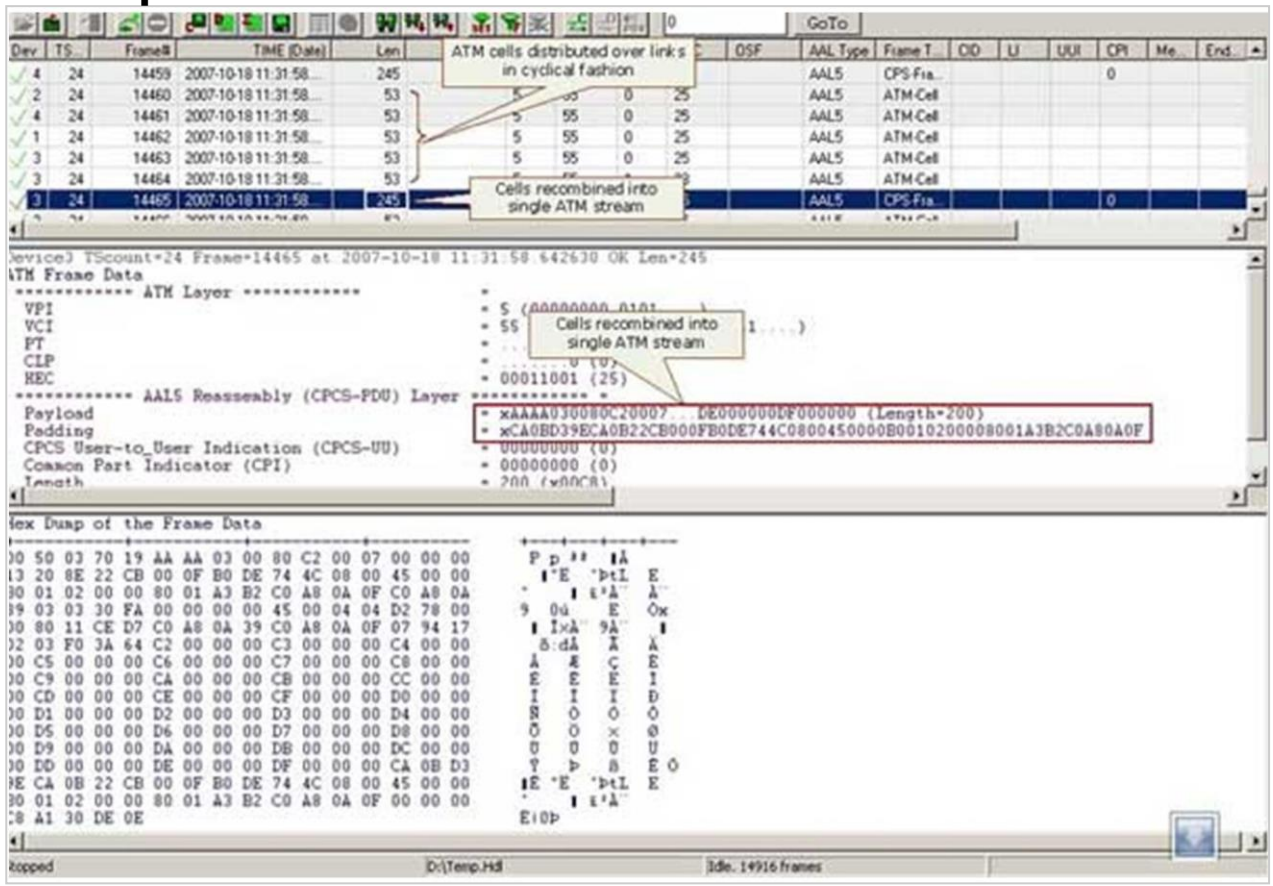
- The Call Detail Record isolates call specific information for each individual call from the captured data and display the information in an organized fashion



Inverse Multiplexing in CDMA A3A7

- The CDMA Analyzer can capture and reassemble frames that were transmitted with Inverse Multiplexing option
- With Inverse Multiplexing over ATM (IMA) feature, up to 8 T1 E1 links can be configured to form a high-speed connection
- ATM cells are transmitted across multiple interfaces in a cyclical fashion, and recombined to form the original stream

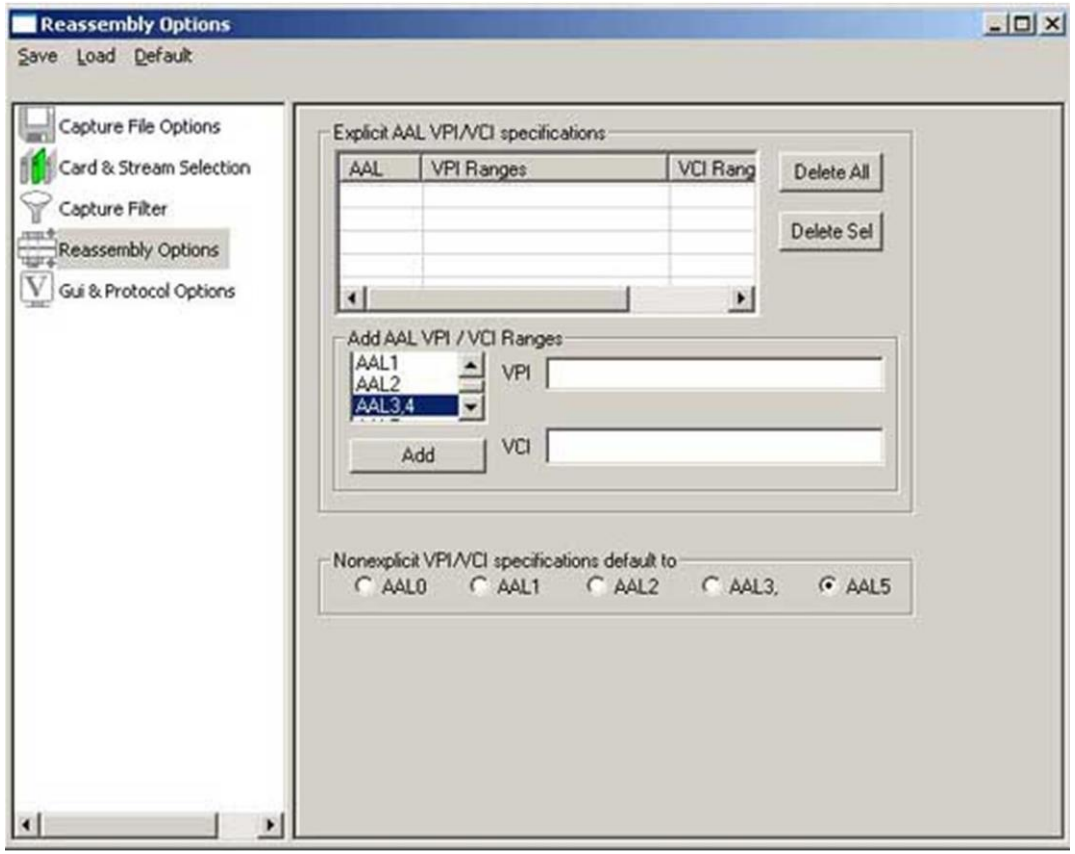
Captured ATM Frames with IMA in A3A7 Interface



Reassembly in CDMA A3A7

- Using reassembly option user can specify VPI /VCI value to reassemble using the segmentation and reassembly rules defined by the specified AAL type

Reassembly Options in A3A7 Interface



Thank You!