

Supports SIP (3261), Megaco (3525, 3015), MGCP, H323

Decodes MAC, IP, IPv6, SIP-I, SIP-T, RTP, RTCP, T.38 (Fax over IP), Video, & more

Real-time and Offline Analysis

Includes Protocol Analysis & Traffic Analysis Views

Filter and Search Features

E-Model (G.107) MOS (ITU-T, G107, Emodel) R-Factor, Packets Discarded, T.38 Analysis, & Call Graphs

Gap, Jitter, Spectral Display, Wave Graphs, R-Factor Statistics, & more

Active Calls, Avg Jitter, RTP Packets Graphs

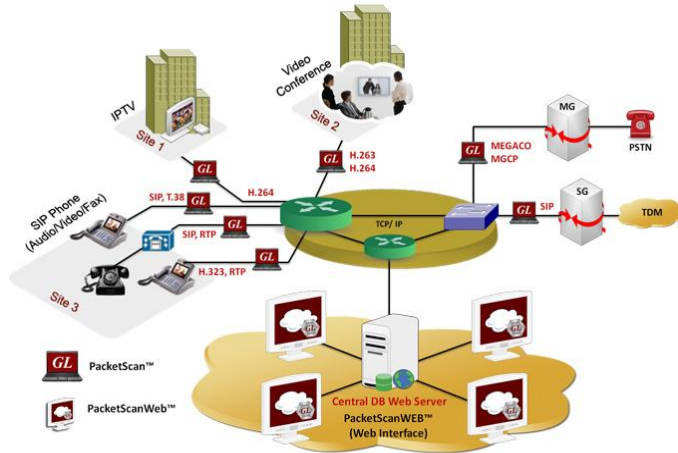
Provides Video Capturing

Statistics RTP, RTCP, Inband Events & Other Counters

Video Codecs- H263++ CIF 190, 350, 512 kbps, & QCIF 64, 80, 128 kbps, H264

Customize Decode Options

PacketScan™ (SIP / H323 / Megaco / MGCP / RTP / RTCP / Fax / Video Analysis)



Overview

PacketScan™ is a powerful software tool that provides extensive real-time reporting using graphical charts and statistics of live IP, VoIP, and IP based Video traffic:

- Live monitoring Ipv4 and IPv6 (version 4 and version 6) networks
- Segregates, captures, and collects statistics on VoIP calls
- Monitors QoS (quality of service) on voice and video calls,
- Permits analysis of adherence to protocol standards for the system under test or observation,
- Provides graphical presentation of analysis, including ladder diagrams of protocols
- Extracts fax images in TIFF format

Hundreds of calls can be monitored in real-time including detailed analysis of selected voice band streams. Users can listen / record audio and video data of a session in real-time; perform power, frequency, spectral, tone and digit analysis, and video analysis with ease and precision; get an exact picture of QoS (quality of the service). The application is capable of displaying Video Statistics such as SSRC, Total Packet Counts, Missing Packets, Duplicate Packets and Out of sequence Packets, Media Delivery Index (MDI- (Delay Factor : Media Loss Rate)), Video Frame Count, Frame Rate, and Average MDI. PacketScan™ with Video QoS capability addresses Video Call Quality in IP networks. PacketScan™ also includes Virtual Packet Analysis (VPA) and Packet Data Analysis (PDA)/ Traffic Analyzer (TA) views.

For more details, visit <http://www.gl.com/packetscan.html>

Main Features

- As a Stand-alone tool
 - Capture calls in real-time for infinite time,
 - Monitor adherence to protocol standards, report, and
 - Analyze with rich graphics, ladder diagrams, call trace
 - Complex Filtering and Search capabilities to record all or filtered traffic into a trace file
 - Consolidated interface allows access to all the important settings and auto-startup actions

As a Single Point Analysis System

PacketScan™ has been enhanced to work with GL's [VoiceBand Analyzer \(VBA\)](#) and [Call Data Records \(CDR\)](#) applications to provide useful call detail records for further analysis using built-in tool in Excel®.

As a Probe with Central Monitoring System - PacketScanWEB™

A central monitoring system for a comprehensive view of network performance. It features rich graphics, ladder diagrams, CDRs (Call Data Records), and almost every CODEC.



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- Supported Codecs
- AMR, AMR-WB, EVRC
 - G.711 (μ-law and A-Law - 64 Kbps)
 - G.711 App II (A-law and μ-law with Voice Activity Detection)
 - G.726 (40/32/24/16 kbps)
 - G.726 (40/32/24/16 kbps) with Voice Active Detection
 - GSM (13.2kbps), GSM EFR (12.2 kbit/s), GSM HR
 - G729 (8kbps)
 - G729B (8kbps)
 - G.722 G.722.1 (24 kbps and 32 kbps Wideband) and more.

- Supported Protocols
- Almost all industry standard protocols decode supported – Visit [Supported Protocols](#) for more details

- QoS Parameters
- E-model (G.107) based MOS/R-Factor scores
 - Media Delivery Index (Delay Factor: Media Loss Rate) for video calls
 - H.263, H.264 codec support

- Traffic Handling
- Segregation of IP traffic, and VoIP calls
 - Listen and Record RTP (Audio) streams
 - Record Video and Video QoS Statistics

- Performance Metrics
- Signaling, audio, and video QoS parameters for each SIP, MEGACO, RTP, H.323, T.38 call
 - Minimum, maximum, and average Round Trip Delay (RTD)
 - Inband (DTMF & MF) events, RFC 2833 events, RTP/RTCP packet count and reports per direction

- Triggers and Actions
- Filter captures based on SIP, RTP, Megaco, and H323 parameters followed by a set of actions for the completed calls.

Summary, Detail, and Hex Dump Views

The Summary View displays various information such as Frame Number, Time, Length, Message Types, IP source and destination addresses, and so on. Any field from the protocol headers can be added to Summary view, i.e, summary fields are completely user-configurable. 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.

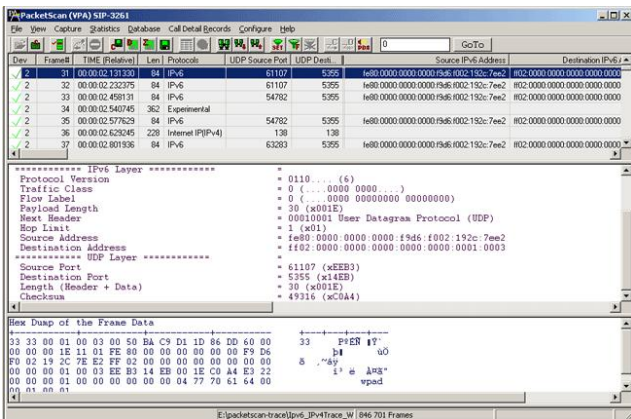


Figure: Different Views

Real-time and Offline Analysis

Users can capture and analyze packets through real-time analysis or analyze the recorded data in offline mode. All captured or filtered traffic can be recorded into a trace file. The recorded trace file can be used for offline analysis or exported to a comma-delimited file or ASCII file.

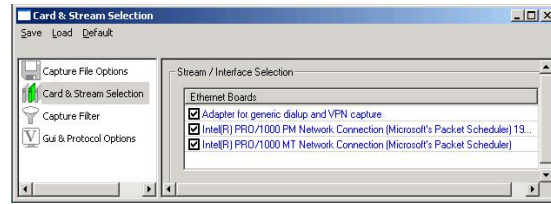


Figure: Real-time Capture

Filtering and Search

Filter and search capabilities adds a powerful dimension to the SIP analyzer. These features isolate required frames from original frames in real-time/offline. Users can record all or filtered traffic into a trace file.

Allows real-time filtering based on parameters set in Data Link layer, MAC layer, IP, TCP/UDP, and more. The offline filter allows filtering based on Frame Number, Time, Length, Message Types, and so on. Similarly, search capability helps user to search for a particular frame based on specific search criteria.

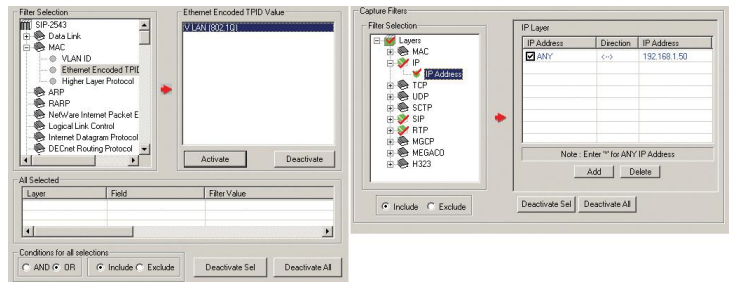


Figure: Real-time / Offline Filter

Call Detail Records & Statistics View

Important call specific parameters like call status, release cause, parties involved and more are displayed in call trace view. Additionally, users are provided with the option to search a particular call detail record from the captured traces.

Statistics can be obtained for all frames both in real-time as well as offline mode. Various statistics can be obtained to study the performance and trend in the VoIP network, based on protocol fields and different parameters.

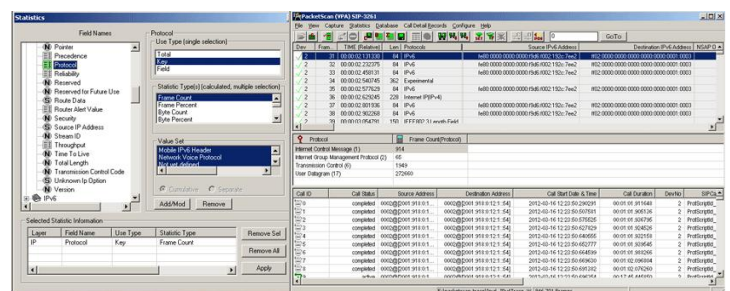


Figure: Define Statistics View



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Packet Data Analysis (PDA) – Summary View

Main Features

- Call Quality Of Service (QoS) for all calls with E-Model based (G.107) Mean Opinion Score [MOS (ITU-T, G.107, Emodel)] and R-factor with individual and summary statistics presented in graphical and tabular formats.
- Provision for H.263+ and H.264 video capture and video conference monitoring capability
- Calculates minimum, maximum, and average Round Trip Delay (RTD) values for SIP calls.
- Individual and summary statistics presented in graphical and tabular formats.
- Graphs are provided for key values to give a pictorial representation of the statistics; some of the graphs available are – active calls, average jitter, E-Model MOS/R-Factor/Packets Discarded, RTP packets summary, ladder diagram for T.38 traffic, and call signaling.
- Displays summary of signaling, audio, and video (for all video calls) parameters of each call in call summary.
- Calls and sessions are classified as active, completed, or failed giving the user an idea about the calls and its status in the network.
- Generates alert summary when particular vital parameters go beyond a specified value.

Summary View

TA Summary view displays summary of data transmission in each direction including calling number, called number, call id, start time, duration, missing packets, max/min RTD, average RTD and so on. It includes separate statistical counts on total packets, calls, failed calls, and more, for SIP, H323, MEGACO, and RTP based calls. The user can get the statistics of active calls, purged calls, and so on.

Call ID	SSRC	Packet Received	Packet Discarded	Missing Packets	Duplicate Packets	Out Of Sequence Packets	Average Delay	Average Jitter	Average Inter Arr.	Complete Packets	Max Min Gap	
1	2735	7632	130 / 1.33 / 133	130	2995	1540	0.000	0.000	36.75	0.00	3	1431.0
2	2737	10250	3197 / 3.98 / 289	2103	0	0	0.000	0.000	20.01	0.00	8	1658
3	2735	7632	130 / 1.33 / 133	130	2995	1540	0.000	0.000	36.75	0.00	3	1431.0

Call Summary – Signaling, Audio, & Video QoS Parameters

The Call Summary displays the signaling, audio, and video parameters of each call for SIP, RTP, MEGACO, and H323 in a tabular format. Video QoS parameters such as Codec Info, Frame Rate, Missing Packets, Delay, Gap, Video Frame Count, Out Of Sequence count, Duplicate Packets count, Media Delivery Index (MDI), etc are displayed for all video calls with H.263 and H.264 codecs.

Call ID	SSRC	Packet Received	Packet Discarded	Missing Packets	Duplicate Packets	Out Of Sequence Packets	Average Delay	Average Jitter	Average Inter Arr.	Complete Packets	Max Min Gap
1	2735	7632	130 / 1.33 / 133	130	2995	1540	0.000	0.000	36.75	0.00	3

Graphs in PDA – Summary View

Active Calls - A line graph, depicting the Number Of Calls Vs Time.

Average Jitter Distribution - Distribution of the Average Jitter values across the Total Sessions

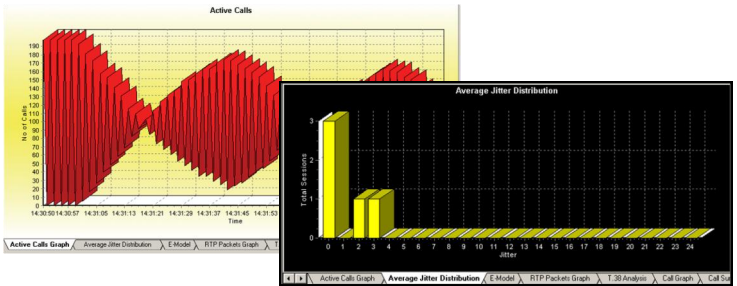


Figure: Active Calls and Average Distribution Graphs

E-model - This graph provides R-factor, MOS and packets discarded against number of sessions- all these three graphs show statistics of terminated calls.

- R-Factor – A bar Graph that plots R-Factor across No of Sessions.
- MOS – A bar Graph that plots Mean Opinion Score values across No. of Sessions.
- Packets Discarded – A bar Graph that plots Packets Discarded across No. of Sessions.
- RTP Packets Graph - Plots and compares out of ordered packets, missing packets and duplicate packets against Total Audio Packets

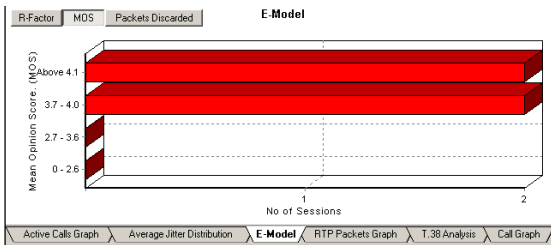


Figure: E-Model Graph

T.38 Analysis - Fax (T.38 data) over VoIP monitoring and decoding capability.

Call Graph - Displays the message sequence of captured VoIP calls.

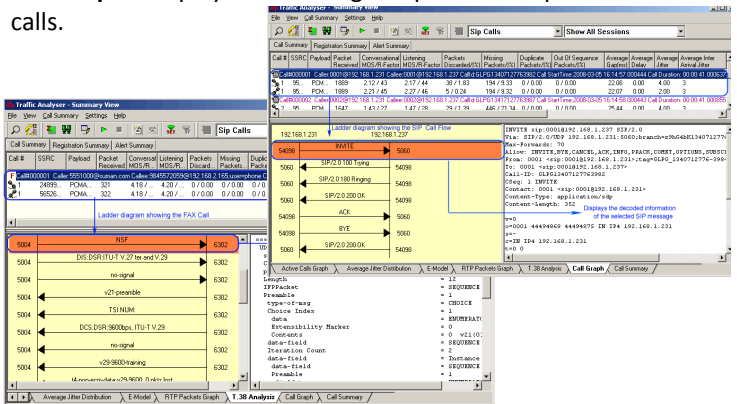


Figure: T.38 analysis and Call Flow Ladder Diagram



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Packet Data Analysis (PDA) – Detail View

Main Features

- Provides further detail statistics on the two (or one) RTP sessions that are part of a single call.
- RTP sessions include the graphical representation of R-Factor statistics which includes Quality Metrics with R-Factor and MOS Factors graphs, Jitter Buffer Statistics, Degradation Factor, Burst Metrics, and Delay Metrics.
- R factors/MOS is supported for audio codecs such as Mulaw, Alaw, G726 (40, 32, 24, 16 kbps), G726 (40, 32, 24, 16 kbps) with VAD, GSM610, G729, G729B, AMR, ILBC (20, 30 msec), SPEEX, EVRC, EVRCB, SMV, G711, G722, and G722.1 application II.

Packet Data Analysis (PDA) - Detail View

This display assists in any comparisons that are to be made between the two RTP sessions of a call. Each frame of the selected session is dissected and its contents are displayed in a tabular form for easier viewing and comparisons. Vital aspects from the RTP frame needed for close analysis are included in the table.

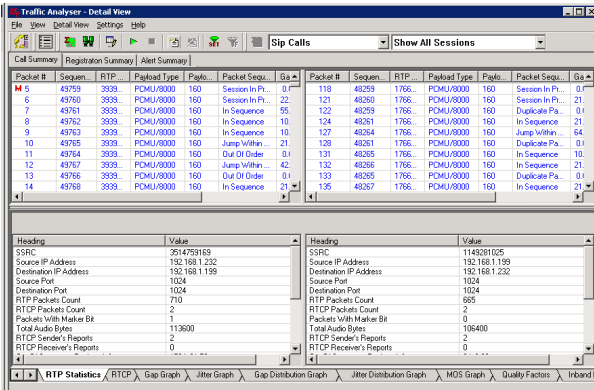


Figure: Traffic Analyzer Detail View

Graphs in PDA – Detail View

Gap/Jitter graphs - Plots the Gap (in milliseconds)/Jitter versus the packet number

Gap Distribution Graph - Number of packets with a particular value of gap is plotted against the (gap) value.

Jitter Distribution Graph - Number of packets with a particular value of jitter is plotted against the jitter value

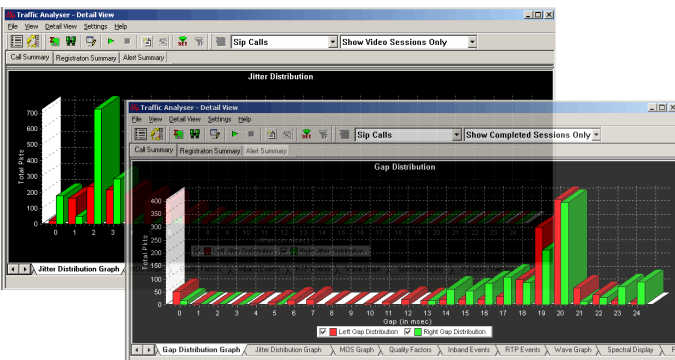


Figure: Gap/Jitter Distribution Graph

MOS Graph - Plots Mean Opinion Score values throughout the duration of the call.

Wave graph - Displays the amplitude of the incoming signal in a selected call as a function of time.

Spectral Display - Displays the power of incoming signal while the capturing is going on as a function of frequency.

Degradation Factor – A pie chart plots and compares different statistics such as Good Quality, Packets discarded, Echo level, Packet loss, and Regency against total Packets for each individual sessions.

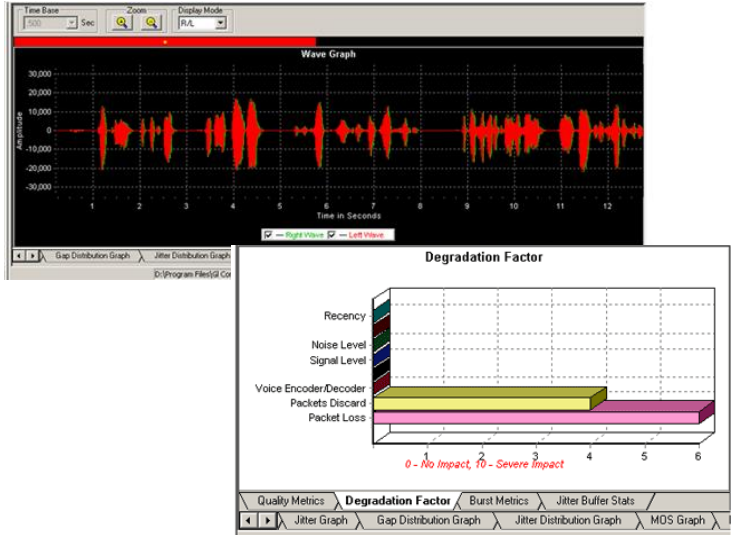


Figure: Wave Graph and Degradation Factors

R-Factor Statistics

Quality Metrics based on E-model includes R-Factor and MOS Factor. **R-Factor** bar graph will display statistics such as R Listening, R Conversational, R-G107, and R-Nominal values.

MOS Factor bar graph will display statistics such as MOS CQ, MOS PQ, and MOS Nominal values during a call.

Jitter Buffer Statistics – A pie chart plots and compares packets received, packets discarded and packets lost against total Packets for each individual sessions. Also provides a tabular data on average.

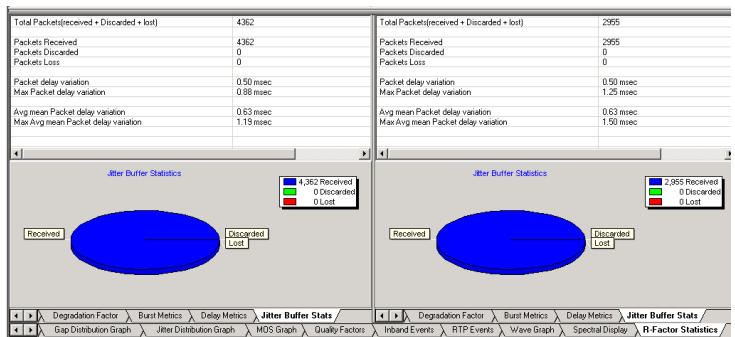


Figure: Jitter Buffer Statistics



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Other Features in PDA View

Play Audio and Write to File

The Play Audio plays the selected call to the PC speaker. Write to File is similar to the Play Audio option. The basic difference being that the output is written to a file instead of playing to the speaker.

PDA can monitor video calls and display both audio and video RTP streams in summary view. Users can record video calls to a file in QuickTime format, which can be viewed by VLC player.

Record Video

Record Video option is available for both auto detected RTP calls and SIP calls. Supported video codecs are: H263++ CIF 190 kbps, H263++ CIF 350 kbps, H263++ CIF 512 kbps, H263++ QCIF 128 kbps, H263++ QCIF 64 kbps, H263++ QCIF 80 kbps.

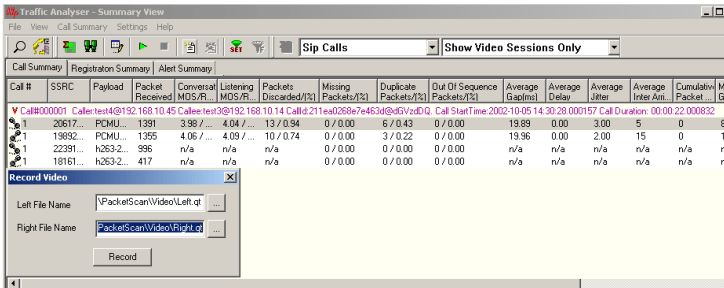


Figure: Record Video

Save Call

The Save Call feature enables the user to save a particular call either in GL's proprietary *.HDL file format or in Ethereal *.PCAP file format. Call Summary details could also be saved for a particular call as a *.rtf file. This is especially useful to get data from real-time traffic locations to the lab for detail analysis of a flawed call.

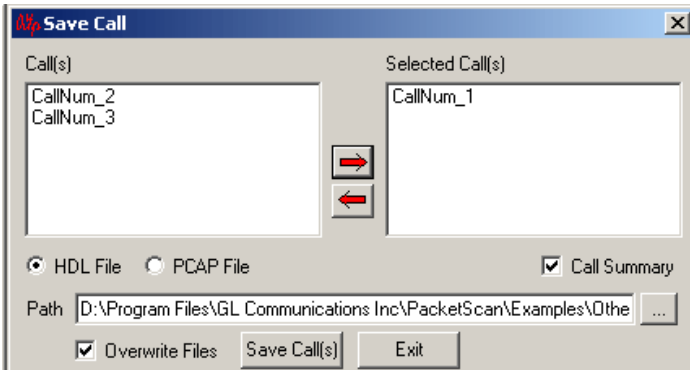


Figure: Save Call

RTP/RTCP Statistics and Inband Events

The user can get the complete details of a single selected call such as Total Packets count, SSRC, RTP packet count, RTCP packet count, Total Audio bytes.

Inband Events display inband DTMF and MF digits as they are received with details such as Timestamp, Type, Event, On-Time, Power, Freq1 / Power1, Freq2 / Power2.

Triggers and Action Settings

Triggers and Action Settings allow the user to filter calls based on certain SIP, RTP, MEGACO, and H323 parameters followed by a set of actions for the completed calls. The filtered file can be saved in either GL's proprietary HDL file format or Ethereal PCAP file

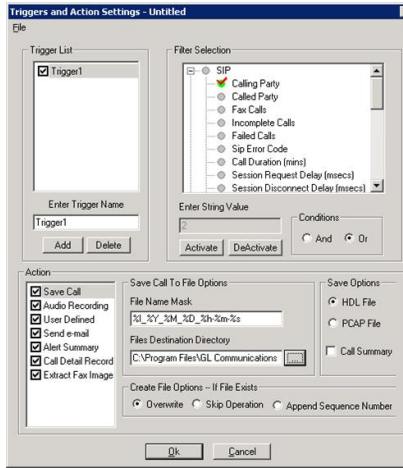


Figure: Trigger and Action Settings

Alert Summary

PacketScan™ PDA generates alerts when particular vital parameters go beyond a specified value and display in Alert Summary table. The user can specify the criteria based on which the alerts are to be generated. The tab provides an active list of the alerts that have occurred during the test session in tabular columns.

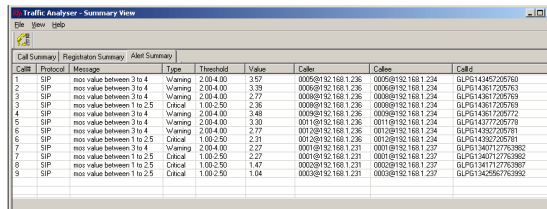


Figure: Alert Summary View

Packet Data Analysis (PDA) – Registration Summary

- Provides the registration summary of each SIP registration including the user agent, registrar, status, registered time, expiry time, time to live, remaining time, registration request delay (RRD), and Re-registration Attempts.
- Provides graphical view of the active registrations and registration trace of each registration

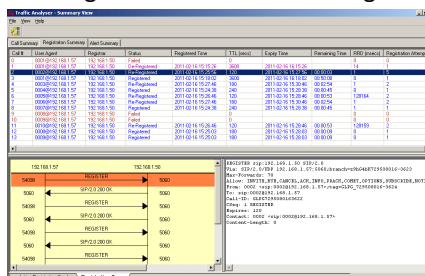


Figure: Registration Summary



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Supported Protocol Standards (For complete list, visit <http://www.gl.com/packetscan.html>)

The supported protocol standards in PacketScan are SIP-3261, Megaco3525, Megaco3015, and H323.

Supported Protocols	Specification Used
MAC	IEEE 802.3
IP / TCP / UDP	RFC 791 / RFC 793 / RFC 768
ICMP	RFC 792
SIP 3261	RFC 3261
RTCP	RFC 3550
RTP	RFC 2833
MEGACO	RFC 3525, RFC 3015
MGCP	RFC 3435
H245	H.245
RAS	H.225
ISDN H225	H225 Q.931 Layer
STUN	RFC 3489
DNS	RFC 1035
DHCP	RFC 1533, 2131
SMTP	RFC 2821
POP3	RFC 1939
HTTP	RFC 2616
FTP	RFC 959
SNMP	RFC 1157,1155,1902,3416,2863,2578,3418,2011,2012 etc
T38	ITU-T T.38
RFC 2833	RFC 2833 / RFC 4733
H263	ITU-T H.263
STP	IEEE Std 802.1D-2004
IPv6	RFC 2460, RFC 2402, RFC 2406
PPPoE	RFC 2516
ISUP ITU	ITU - Q.761, Q.762, Q.763 and Q.764

Buyers Guide:

[PKV100](#) - PacketScan™ (Real-time and Offline)

[PKV101](#) - PacketScan™ - Offline

Related Software

[PCD103](#) - AMR Codec for PacketScan™

[PCD104](#) - EVRC Codec for PacketScan™

[PCD105](#) - EVRC-B Codec for PacketScan™

[PCD106](#) - EVRC-C Codec for PacketScan™

[PKV170](#) - PacketScanWeb™

[PKV105](#) - SIGTRAN Offline Analyzer

[PKS100](#) - PacketGen™ (includes PacketScan™)

[PKS110](#) - PacketH.323

[PKB100](#) - RTP ToolBox™

[PKS120](#) - Message Automation & Protocol Simulation (MAPS™) for SIP Testing

[PKS122](#) - MAPS for Megaco Testing

[IPN100](#) - IPNetSim™- 1Gbps of through bandwidth



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