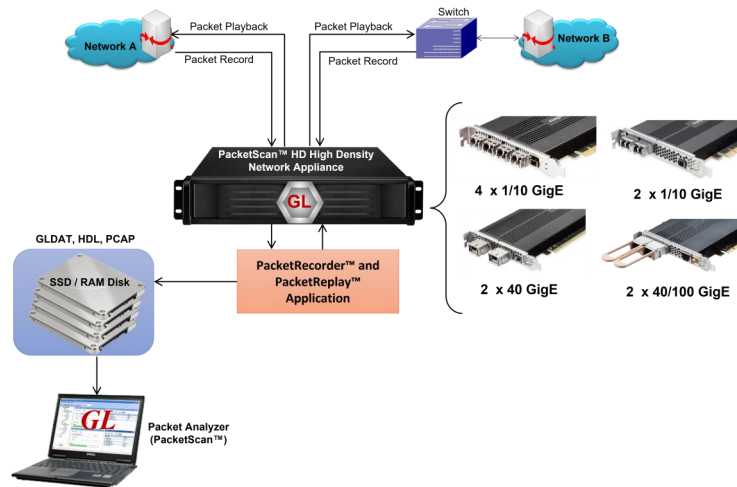


PacketRecorder™ and PacketReplay™



Overview

PacketRecorder™ and Playback™ application allows Playback and Record modes of operation simultaneously. In PacketRecorder™ mode, high speed real-time traffic can be recorded with precise hardware time stamping. The Record feature includes a powerful Hardware Filter that allows users to filter out unwanted traffic, and continuously capture the traffic of interest up to the limits of the hard disk size and the disk write speed. The application supports file formats such as PCAP (Wireshark® format), HDL (GL Proprietary format).

In Playback™ (Replay) mode, user can re-transmit recorded traffic on selected network interface ports and analyze the traffic replay using packet analyzers such as GL's PacketScan™. The Packet Recorder and Playback application is an add-on software with GL's PacketScan™ HD network appliance a high speed Ethernet packet capture appliance with large RAM, storage capacity and powerful protocol analysis software.

For more details, visit [Packet Recorder and PacketReplay for High Density Network Traffic](#) webpage.

Main Features

- PacketRecorder™:
 - Captures 100% packet data on high speed lines (maximum of 5 Gbps data rate)
 - Capture packets non-intrusively over Ethernet (Electrical) and Optical ports at Nano-second precision
 - Recording can be done on single port or combination of one or more ports and multiple recorder can run simultaneously
 - Flexible options to record traffic continuously based on File size, File count, Frame count and Duration
 - Record only traffic-of-interest by applying efficient hardware filters based on MAC, 802.1Q (VLANs), IPv4/IPv6, Tunnel Traffic (Tunnel 1 and Tunnel 2), TCP, UDP, SCTP, SIP, and RTP parameters
 - Filter on inner layer of GTP, GRE, and VXLAN tunnel traffic like inner IPv4/IPv6 addresses and Transport Protocols (UDP, TCP and SCTP) port numbers
 - User can create their own filters using custom filter option which provides flexibility to check the fields and use the logical AND, OR conditions more efficiently
 - Option to view the historical graph of overall rate, frames/sec, per-port rate, per-port frames/sec, and port down status from the record start time to end time
 - Provides statistics of captured frame count, dropped frame count, recorded frame count capture rate, frame rate, recorded files count, and more
- Playback File™ (PacketReplay™):
 - Replay the pre-recorded traffic files at the same rate at which it is captured (maximum of 1 Gbps data rate)
 - Provides options to playback single file or multiple sequential files
 - Provides statistics of total frames transmitted, under sized frames count, oversized frames count and different sized frame count etc.



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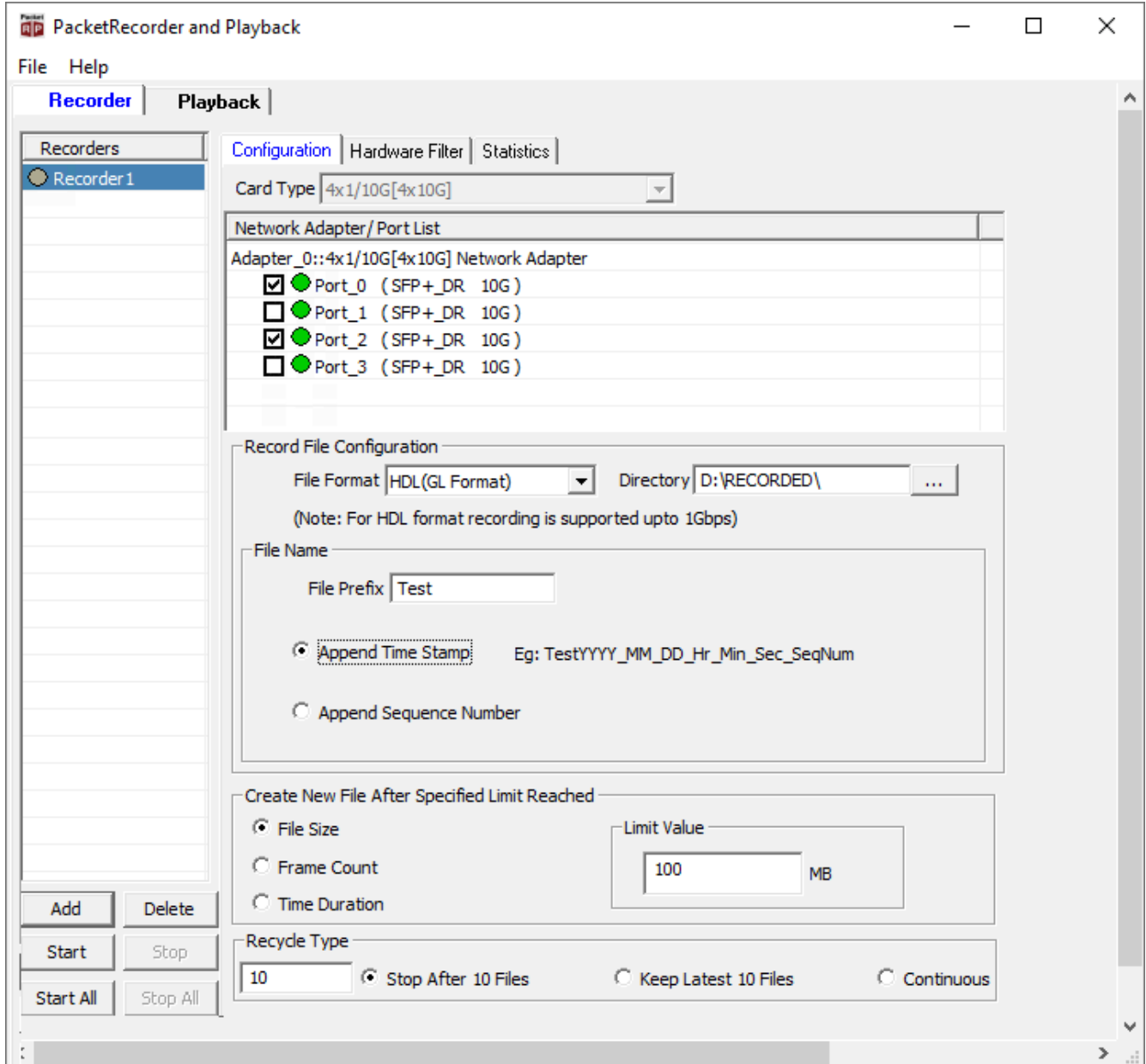
Specifications

<p>Hardware Requirements</p>	<ul style="list-style-type: none"> • Requires GL's HD Network Interface adapters • High Density Network Adapters can be any of the following types – <ul style="list-style-type: none"> – 4 x 1/10 Gbps – requires 850/1310 nm SFP Module; Ethernet/Optical SFP modules – 2 x 40/100 Gbps – requires MTP/MPO Connector for CFP2; Optical only • Hard Disk: SSD hard disk (For faster I/O operations) compatible with SATA verIII or RAM Disk. • System Configuration: 2U system with 32 GB to 128 GB RAM.
<p>Hardware Filters</p>	<ul style="list-style-type: none"> • Supports defining up to 10 filters at Layer 2, 3, 4, and 5 • MAC: Frames can be filtered out based on Source MAC address, destination MAC address, Ether Type and FCS Error • VLAN 0, 1, 2: Filters frames based on Tag protocol ID, User Priority, CFI, and VLAN ID • IPv4: Frames can be filtered based on Source IP Address, Destination IP Address, Protocol Type, Header Length, Differentiated Services, Ds_ECN, DS_CodePoint, Total Length, Check Sum Error, IP Datagram ID, Fragmentation Offset, Flag_DontFragment and Flag_MoreFragments • IPv6: Frames can be filtered based on Source IP address, Destination IP address, Next Header, and Payload Length • Tunnel Traffic: Tunnel filter provides a method to filter the packets of one protocol within another protocol. GTP, GRE and VXLAN are available tunneling methods. Hardware filters can be applied to Tunnel 1 and Tunnel 2 layers • ARP: Frames can be filtered based on Sender MAC Address, Target MAC Address, Sender IP Address, Target IP Address and Option Code • TCP: In TCP layer Frames, can be filtered based on source port, destination port and check sum error • UDP: In UDP layer Frames can be filtered based on source port, destination port, check sum error, UDP length and payload • SIP and RTP: SIP and RTP packets can also be filtered based on source port or destination port
<p>Record Rate</p>	<ul style="list-style-type: none"> • Max Rate is 5 Gbps
<p>Playback Rate</p>	<ul style="list-style-type: none"> • Max Rate is 5 Gbps

PacketRecorder™ Application

Recorder application provides various options to capture the high density real-time traffic on selected card type, and store the recorded traffic into a file. The number of recorded files can be saved sequentially or with Timestamp.

The application can capture the traffic continuously until user stops the recorder. The recorder can be stopped automatically after creating specified number of files, or the traffic can be over-written by keeping latest number of files.

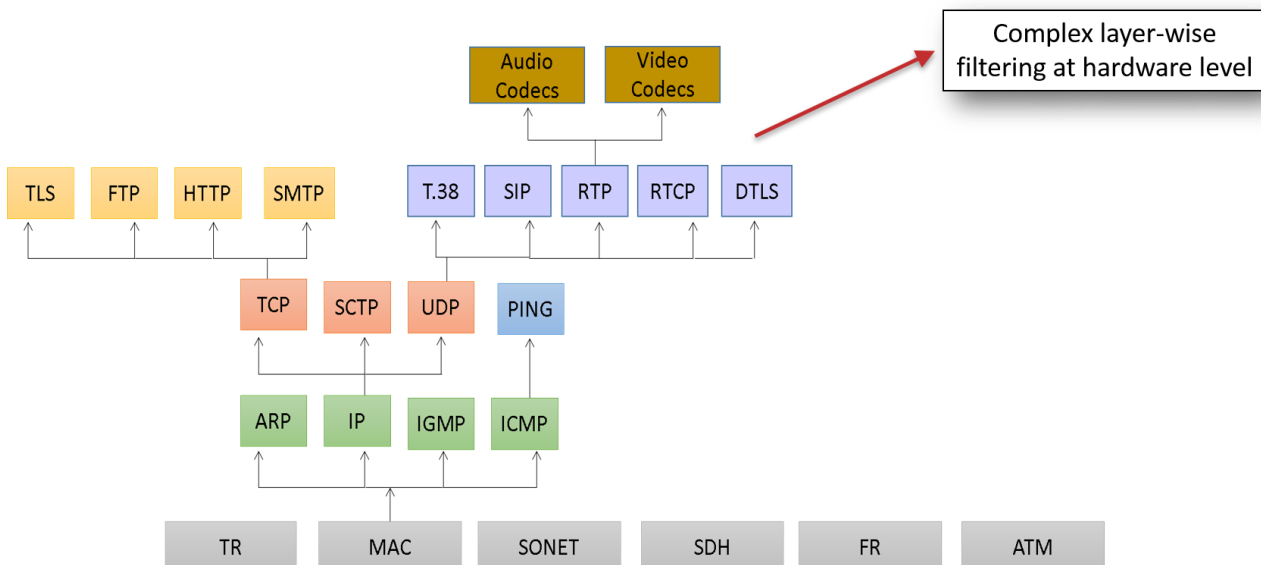
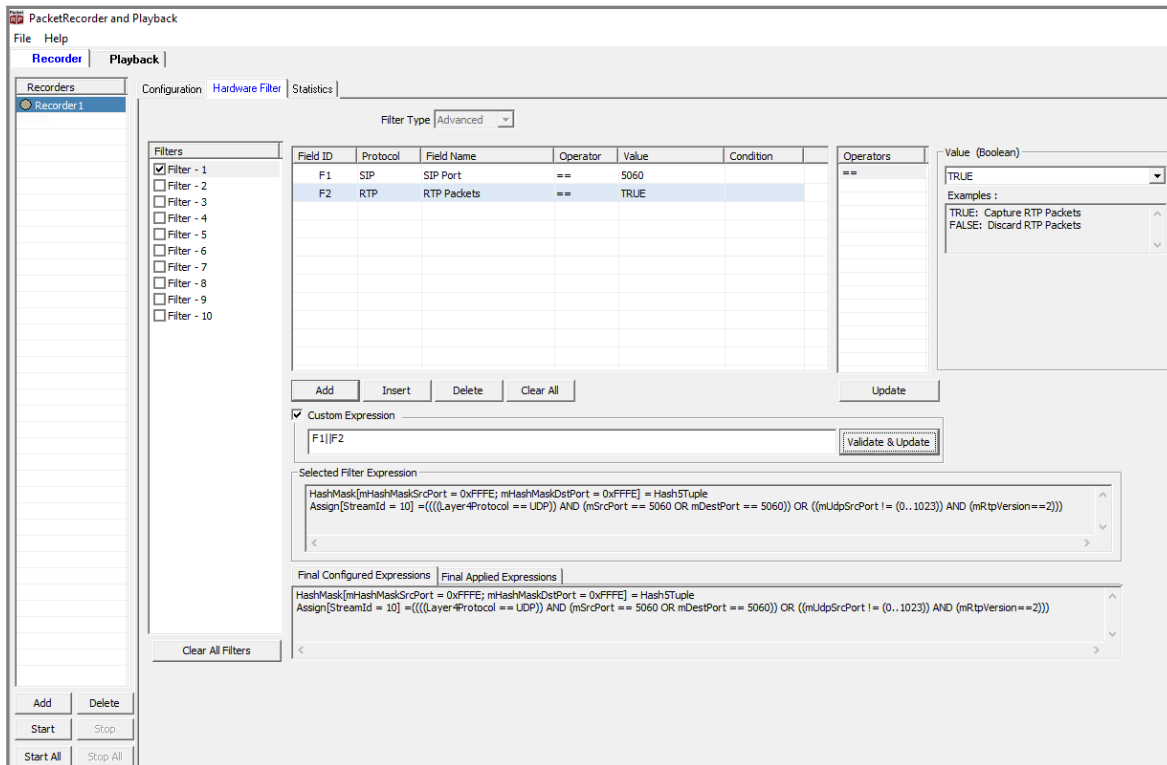


Comprehensive Filtering Capabilities

The **Recorder** application permits user to filter out traffic of interest prior to capture :

Hardware Filter

- Permits user to filter out packets of interest at hardware level on high density network and discard unwanted traffic
- Create up to 10 user defined hardware filters to filter-out traffic based on Layer-wise parameters such as **Frame size** and **MAC**, **802.1Q (VLANs)**, **IPv4 /IPv6**, **TCP**, **UDP**, **SCTP**, **GTP**, **SIP**, **RTP** and more.
- Ability to set filter conditions either before capturing the packets, or while running real-time capture
- Complex filtering capabilities at the lower hardware level result in Low CPU load on the host server



PacketRecorder™ Statistics

Provides statistics of Filter Match Frames, Filter Not Match Frames, Total Frames, Filter Match Frames %, Dropped Frames (Due to Buffer Overflow), Recorded Frames, Recorded Bytes (Gbytes), Dropped Bytes, Capture Rate (Mbps), Filtered Rate (Mbps), Filtered Bytes (%), Capture Frame Rate (Frames/Sec), Filtered Frame Rate (Frames/Sec), Filtered Frames (%), Recorded Files, Record Duration (hr:min:sec), Current Recording FileName, Bytes Written to Current File, Available Host Buffer Size (Kbytes), Utilized Host Buffer Size (Kbytes), Available OnBoardMemory Size (Mbytes), Utilized OnBoard Memory Size (%), Utilized OnBoard Memory Size (Mbytes), Disk Write Rate(Bytes/sec).

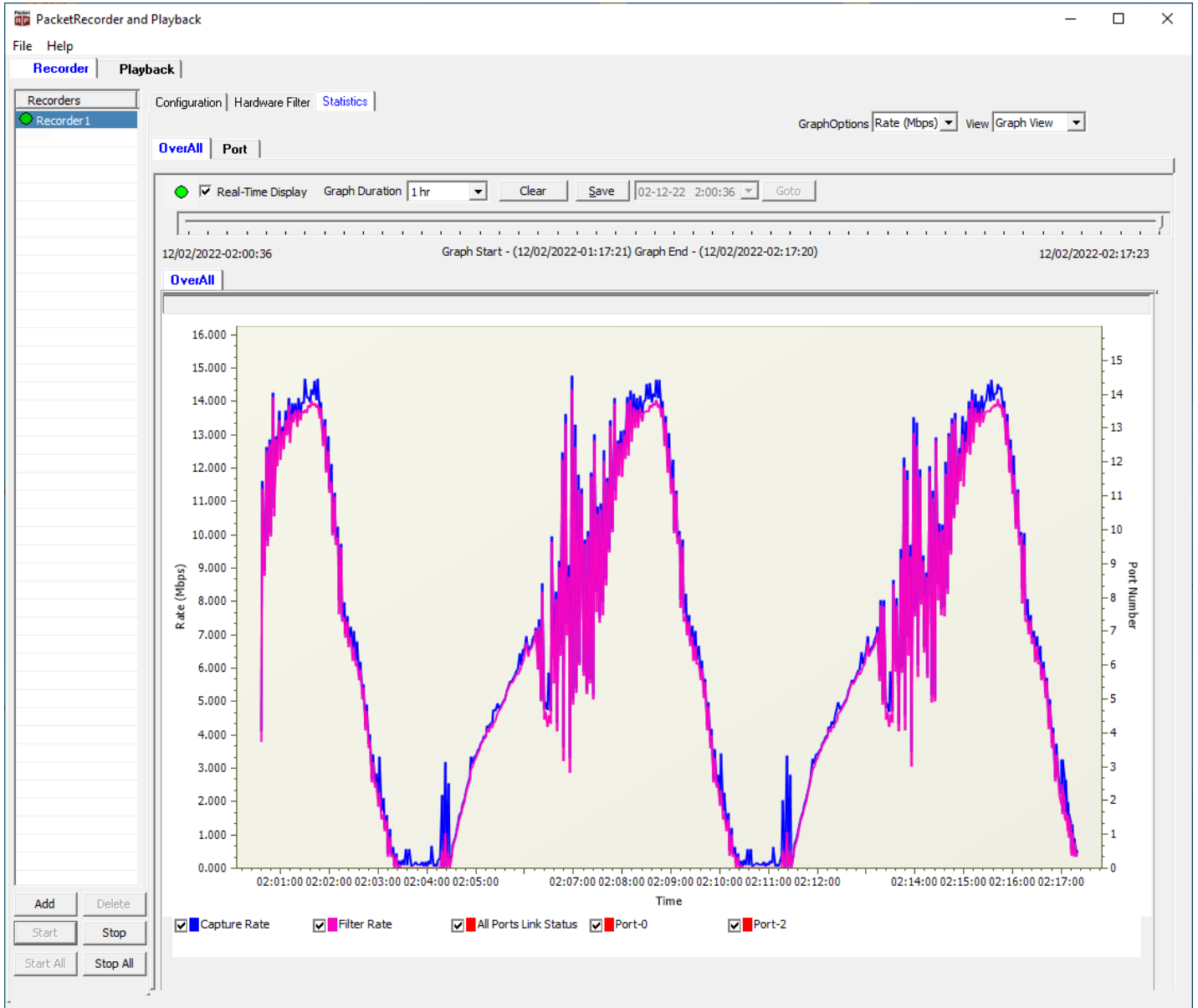
The screenshot displays the 'Statistics' tab for 'Recorder 1' in the PacketRecorder and Playback application. The interface includes a menu bar (File, Help), tabs for 'Recorder' and 'Playback', and sub-tabs for 'Configuration', 'Hardware Filter', and 'Statistics'. The 'Statistics' sub-tab is active, showing a table of recording metrics. Below this is a 'Port Statistics' table with columns for 'Aggregate', 'Port-0 (10G)', and 'Port-2 (10G)'. At the bottom left, there are control buttons: 'Add', 'Delete', 'Start', 'Stop', 'Start All', and 'Stop All'.

Statistics	Value
Filter Match Frames	7 085 329
Filter Not Match Frames	106 171
Total Frames	7 191 500
Filter Match Frames %	98.52
Dropped Frames (Due to Buffer Overflow)	0
Recorded Frames	7 087 900
Recorded Bytes(Gbytes)	0.7542
Dropped Bytes	0
Capture Rate(Mbps)	5.69
Filtered Rate (Mbps)	5.55
Filtered Bytes %	96.43
Capture Frame Rate (Frames/Sec)	5 892
Filtered Frame Rate (Frames/sec)	5 813
Filtered Frames %	98.66
Recorded Files	8
Record Duration(hr:min:sec)	00:16:04
Current Recording FileName	Test07.hdl
Bytes Written To Current File	75 785 533
Available Host Buffer Size (Kbytes)	2 621 440
Utilized Host Buffer Size (Kbytes)	1

Port Statistics	Aggregate	Port-0 (10G)	Port-2 (10G)
Filter Match Frames	7 085 329	3 542 616	3 542 713
Filter Not Match Frames	106 171	53 083	53 088
Total Frames	7 191 500	3 595 699	3 595 801
Filter Match Frames %	98.52	98.52	98.52
Dropped Frames (Due To Port Buffer OverFl...	0	0	0
64 Byte Length Frames	0	0	0
65-127 Byte Length Frames	5 748 020	2 874 049	2 873 971
128-255 Byte Length Frames	1 264 754	632 286	632 468
256-511 Byte Length Frames	161 782	80 891	80 891
512-1023 Byte Length Frames	9 700	4 851	4 849
1024-1518 Byte Length Frames	7 232	3 616	3 616
1519-2047 Byte Length Frames	0	0	0
2048-4095 Byte Length Frames	12	6	6
4096-8191 Byte Length Frames	0	0	0
8192-Max Byte Length Frames	0	0	0
Undersized Frames	0	0	0
Oversized Frames	0	0	0
VLAN Frames	0	0	0
MPLS Frames	0	0	0
CRC/Align Error	0	0	0
Temperature(C)	-	42.2	45.6

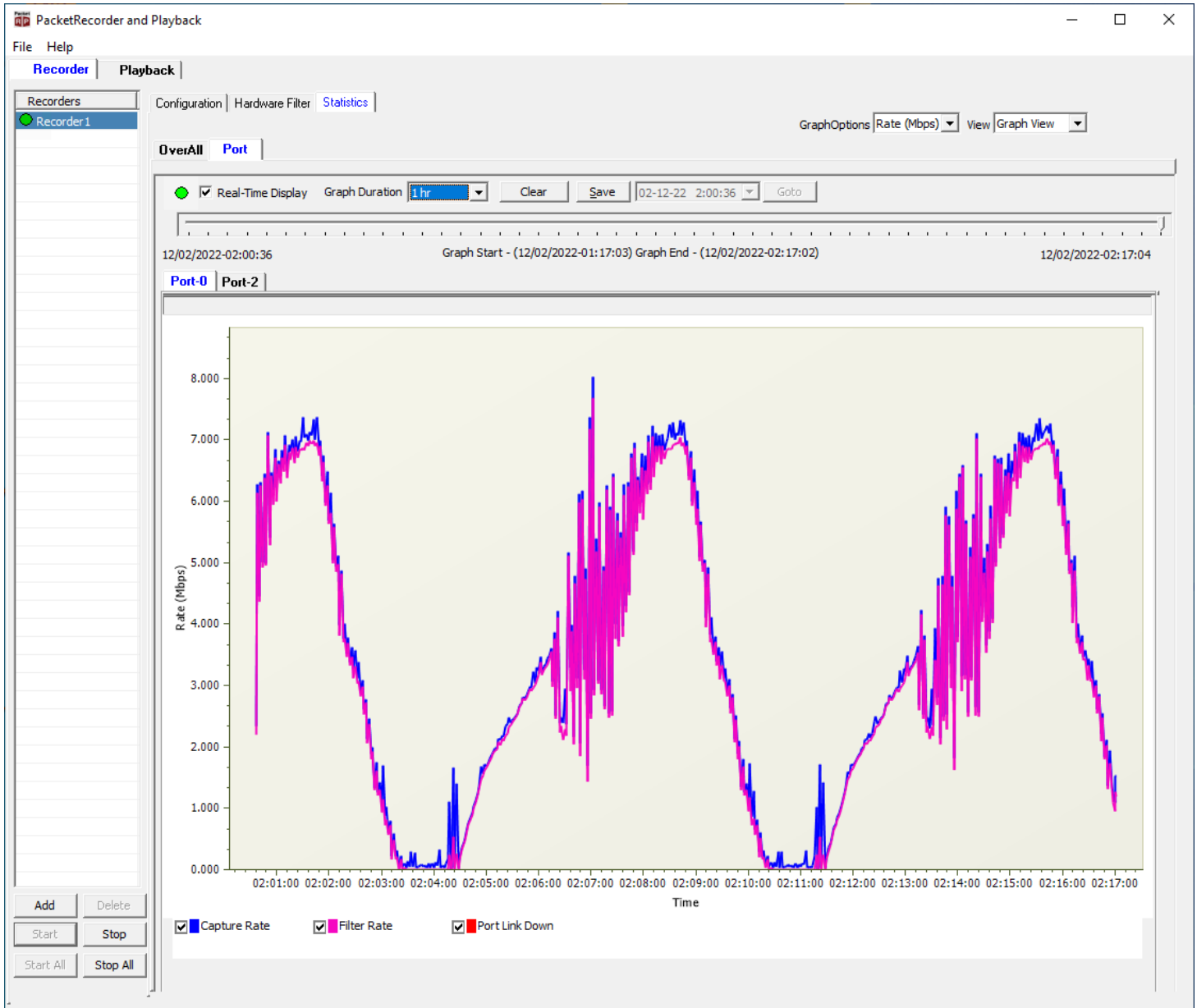
PacketRecorder™ Overall Graph View

User can observe the real time display of graph (Time v/s Rate), Capture Rate, Filter Rate, and Port link Status from past 7 days.



PacketRecorder™ Per Port Graph View

User can observe the real time display of port graph (Time v/s Frames/Sec), Capture and Filtered Frames from past 7 days



Analysis of Recorded File using PacketScan™ Application

- The recorded file can be analysed using PacketScan application.
- User can verify the Nanosecond timestamp, SIP / RTP data packets, and SIP Layer decode information as shown.

The screenshot displays the PacketScan (IpProt) 64-bit application interface. The top menu includes File, View, Capture, Statistics, Database, Call Detail Records, Configure, and Help. Below the menu is a toolbar with various icons and a 'GoTo' field. The main window is divided into two sections: a packet capture table and a detailed packet decode view.

Frame#	TIME (Relative)	Length (Bytes)	Error	Length/Protocol Type MAC	Packet Type MAC	Source IP Address IP	Destination IP Address IP	Source Port UDP	Destination Port UDP	SIP Method SIP	
0	00:00:00.000000000	1027		IPv6	SIP			2152	2152	REGISTER	001
1	00:00:00.000008071	604		IPv6	SIP			2152	2152	200 OK	001
2	00:00:00.000013799	1478		IPv6	SIP			2152	2152	INVITE	001
3	00:00:00.000025088	569		IPv6	SIP			2152	2152	100 Trying	001
4	00:00:00.000029863	609		IPv6	SIP			2152	2152	180 Ringing	001
5	00:00:00.000035226	975		IPv6	SIP			2152	2152	200 OK	001
6	00:00:00.000043091	831		IPv6	SIP			2152	2152	ACK	001
7	00:00:00.000049504	290		IPv6	RTP			2152	2152		
8	00:00:00.000052007	290		IPv6	RTP			2152	2152		
9	00:00:00.000054522	290		IPv6	RTP			2152	2152		
10	00:00:00.000057031	290		IPv6	RTP			2152	2152		
11	00:00:00.000059552	290		IPv6	RTP			2152	2152		
12	00:00:00.000062055	290		IPv6	RTP			2152	2152		
13	00:00:00.000064576	290		IPv6	RTP			2152	2152		

The detailed decode view for frame 0 shows the following information:

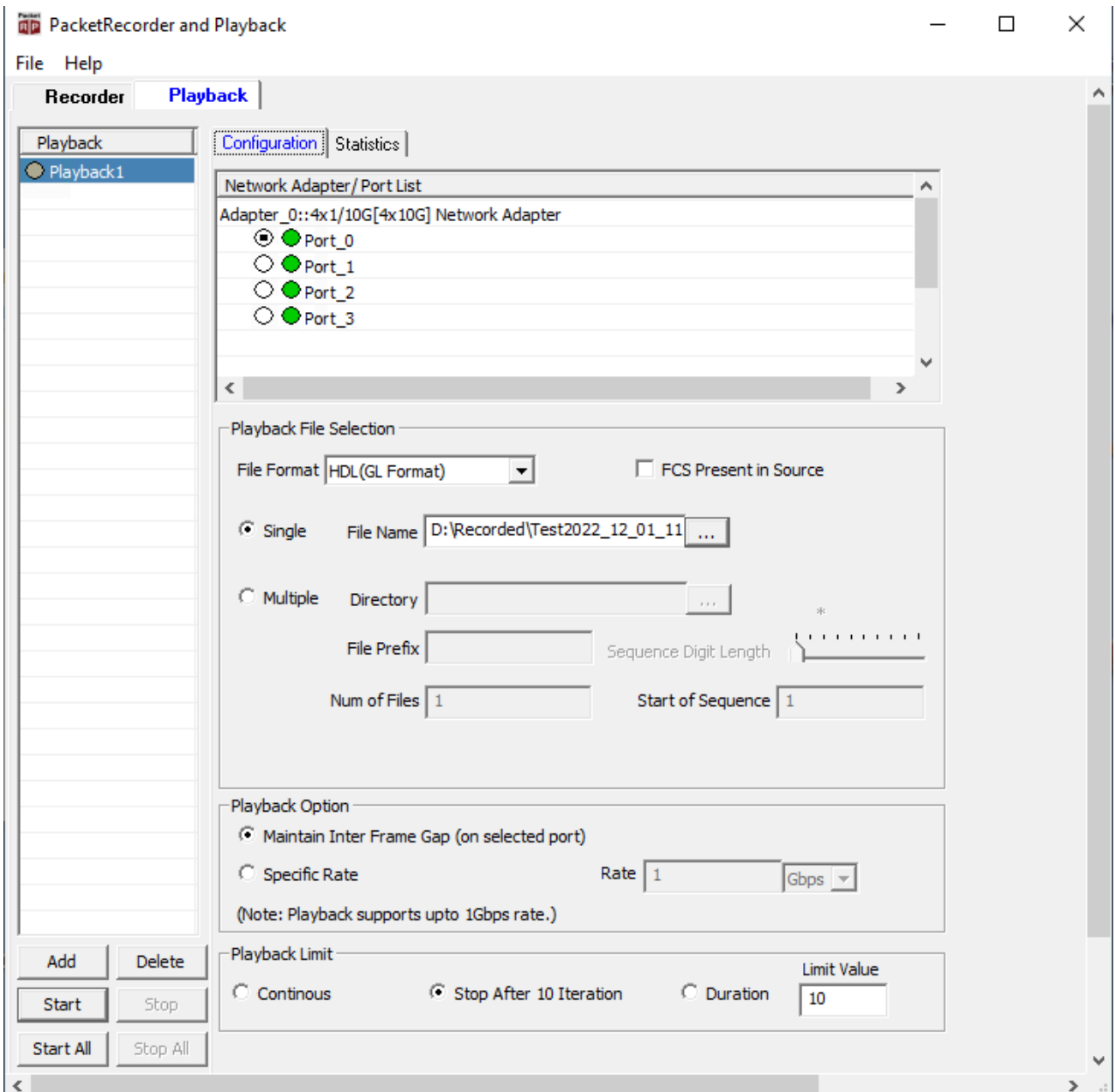
```

004D Hop Limit = 128 (x80)
004E Source Address = fe80:0000:0000:0000:10f8:316d:9afd:4398
005E Destination Address = fe80:0000:0000:0000:64da:3cd4:cff1:9e96
----- GTP UDP Layer -----
006E Source Port = 5060 (x13C4)
0070 Destination Port = 5060 (x13C4)
0072 Length (Header + Data) = 917 (x0395)
0074 Checksum = x3CC9
----- SIP Layer -----
HDR = REGISTER sip:[fe80::64da:3cd4:cff1:9e96] SIP/2.0
HDR = Via: SIP/2.0/UDP [fe80::10f8:316d:9afd:4398]:5060;branch=z9hG4bK-9-702972404-8066-14144
HDR = Max-Forwards: 70
HDR = Allow: INVITE, BYE, CANCEL, ACK, INFO, PRACK, COMET, OPTIONS, SUBSCRIBE, NOTIFY, REGISTER, UPDATE
HDR = From: 3012041631 <sip:001013012041631@[fe80::64da:3cd4:cff1:9e96]>;tag=FromTag-7-702972388-806
HDR = To: sip:001013012041631@[fe80::64da:3cd4:cff1:9e96]
HDR = Call-ID: GL-MAPS-6-702972388-8063-14144@[fe80::10f8:316d:9afd:4398]
HDR = CSeq: 1 REGISTER
HDR = Authorization: Digest username="001013012041631@[fe80::64da:3cd4:cff1:9e96]", realm="[fe80::64da:3cd4:cff1:9e96]"
HDR = Expires: 360000
HDR = Contact: 3012041631 <sip:001013012041631@[fe80::10f8:316d:9afd:4398]>;+g.3gpp.smsip
HDR = P-Preferred-Identity: UE <sip:UE@gl.com>
HDR = P-Access-Network-Info: 3GPP-UTRAN-TDD; utran-call-id: 3gpp-00000000
  
```

The status bar at the bottom indicates 'Off-line Viewing', the file path 'D:\output.hdl', and '3 626 690 Frames'.

Playback™ (PacketReplay) Application

Single or multiple recorded files can be replayed on any of the available port with the same frame rate or user defined frame rate. The application can playback the recorded traffic continuously until user stops the playback. The playback can be stopped after playing N number of files, or after specified duration.



Playback Statistics

Provides statistics of Transmitted Frames, Transmitted Octets, Transmit Rate (Mbps), Frame rate (Frames\sec), Current Iteration, Playing Back FileName, and PlayBack Duration (hr:min:sec).

PacketRecorder and Playback

File Help

Recorder Playback

Playback

Configuration Statistics

Reset

Statistics	Value
Transmitted Frames	93 376 856
Transmitted Octets	27 503 920 412
Transmit Rate(Mbps)	1848.80
Frame Rate(Frames/sec)	794 795
Current Iteration	5
Playing Back FileName	Periodic02.hdl
PlayBack Duration(hr:min:sec)	00:02:01

Port Statistics	Aggregate	Port-0
Total Frames	93 376 856	93 376 856
64 Byte Length Frames	0	0
65-127 Byte Length Frames	0	0
128-255 Byte Length Frames	127 134	127 134
256-511 Byte Length Frames	93 138 478	93 138 478
512-1023 Byte Length Frames	79 460	79 460
1024-1518 Byte Length Frames	31 784	31 784
1519-2047 Byte Length Frames	0	0
2048-4095 Byte Length Frames	0	0
4096-8191 Byte Length Frames	0	0
8192-Max Byte Length Frames	0	0
Undersized Frames	0	0
Oversized Frames	0	0
CRC\Align Error	0	0
Temperature(C)	-	39.5

Add Delete

Start Stop

Start All Stop All

Buyer's Guide

Item No	Product Description
PKV123	PacketRecorder™ and PacketReplay™ (requires any one of PKV120, PKV120p, PKV122, PKV122p) FastRecorder™ and PacketExtractor™

Item No	Related Software
PKV122	PacketScan™ HD – High Density IP Traffic Analyzer w/ 2x10GigE
PKV124	PacketScan™ HD – High Density IP Traffic Analyzer w/ 2x40/100GigE
PKV100	PacketScan™ (Real-time and Offline)
PKV101	PacketScan™ - Offline
PKV170	NetSurveyorWeb™

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

For more details, visit [Packet Recorder and Playback for High Density Network Traffic](#) webpage.



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