
FastRecorder™ and PacketExtractor™ 400 G

(High Speed Packet Capture and Recording up to 400 Gbps)



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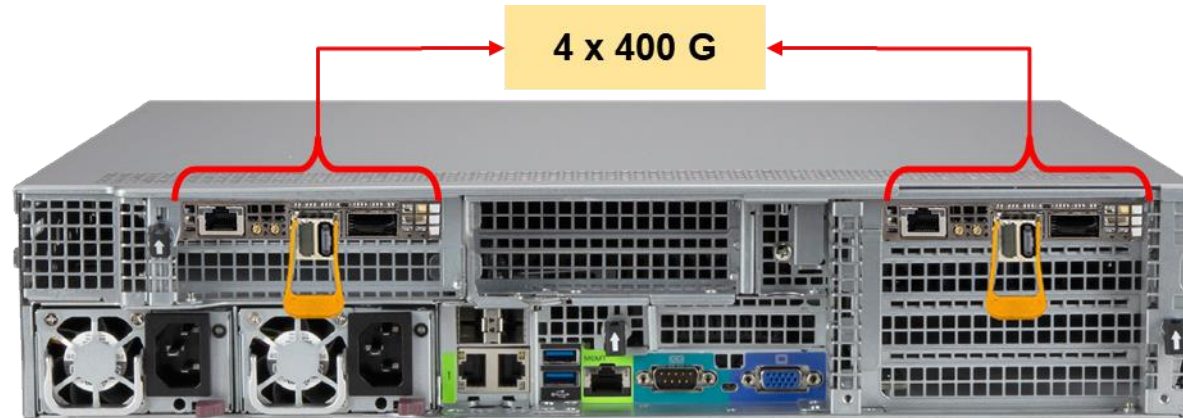
400 Gbps Packet Capture Systems



2-Port Portable System



4-Port Portable System



Dual Processor Rack-mount System

Key Features

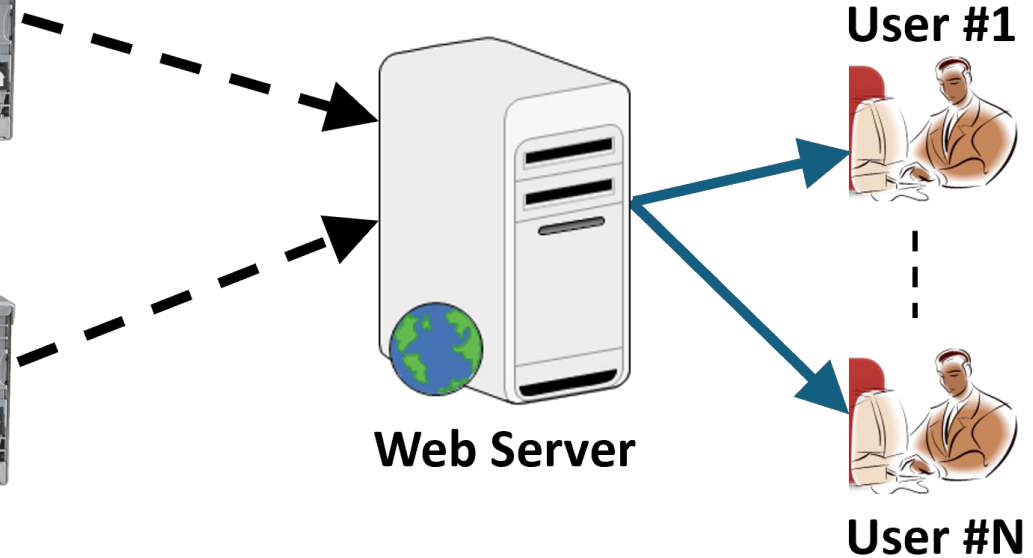
- **High-Speed Duplex 400G Capture (Up to 800 Gbps Total Throughput):** Duplex 400G capture (400G East + 400G West) delivering up to 800 Gbps directly to SSDs — records up to 6 TB per minute
- **Non-Intrusive Continuous Recording:** Non-intrusive capture and continuous recording over Ethernet with nanosecond precision
- **Multi-Port Traffic Merging:** Merges traffic from multiple ports with high-precision timestamps during recording
- **Optimized Distributed Disk Operation:** Optimized distributed disk operation to achieve wirespeed recording to disk
- **Advanced Hardware Filtering:** Apply efficient hardware filters based on MAC, 802.1Q (VLANs), IPv4/IPv6, Tunnel Traffic, TCP, UDP, and SCTP parameters to record only traffic of interest
- **Real-Time Recording Metrics:** Monitors total recording duration, L2 Rx rate, record rates, frame rates, captured frames, dropped frames, and recorded bytes for efficient and accurate high-speed packet capture
- **Live Network Performance Monitoring:** Provides real-time insights into port status, received frames, link utilization, capture rates, error counts, and frame-length distribution for efficient network performance analysis
- **Graphical Rate and Error Analysis:** Users can view Rate and Error Graphs for each port to analyze capture rates and detect issues like segment drops, Multi-Packet Receive Queue (MPRQ) buffer overflows, missed packets, and discarded packets during recording

Multi-Server Connectivity

High Speed Capture and Record System



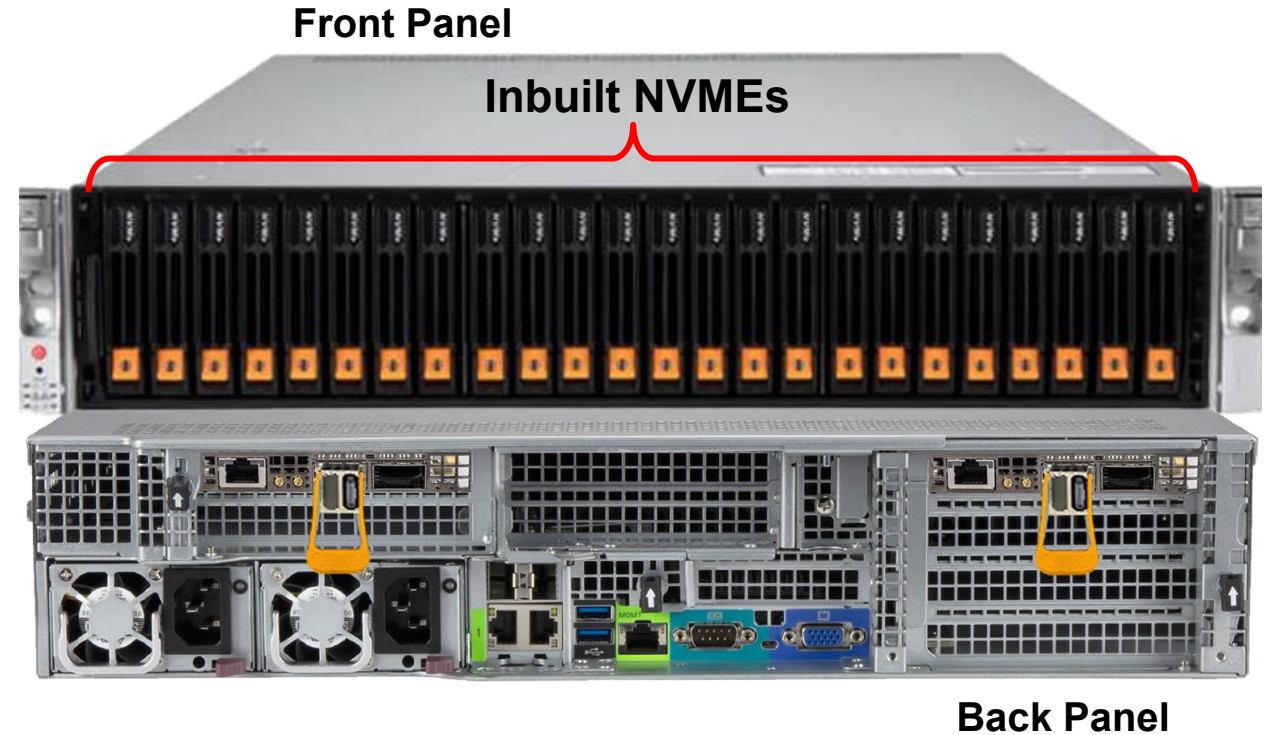
High Speed Capture and Record System



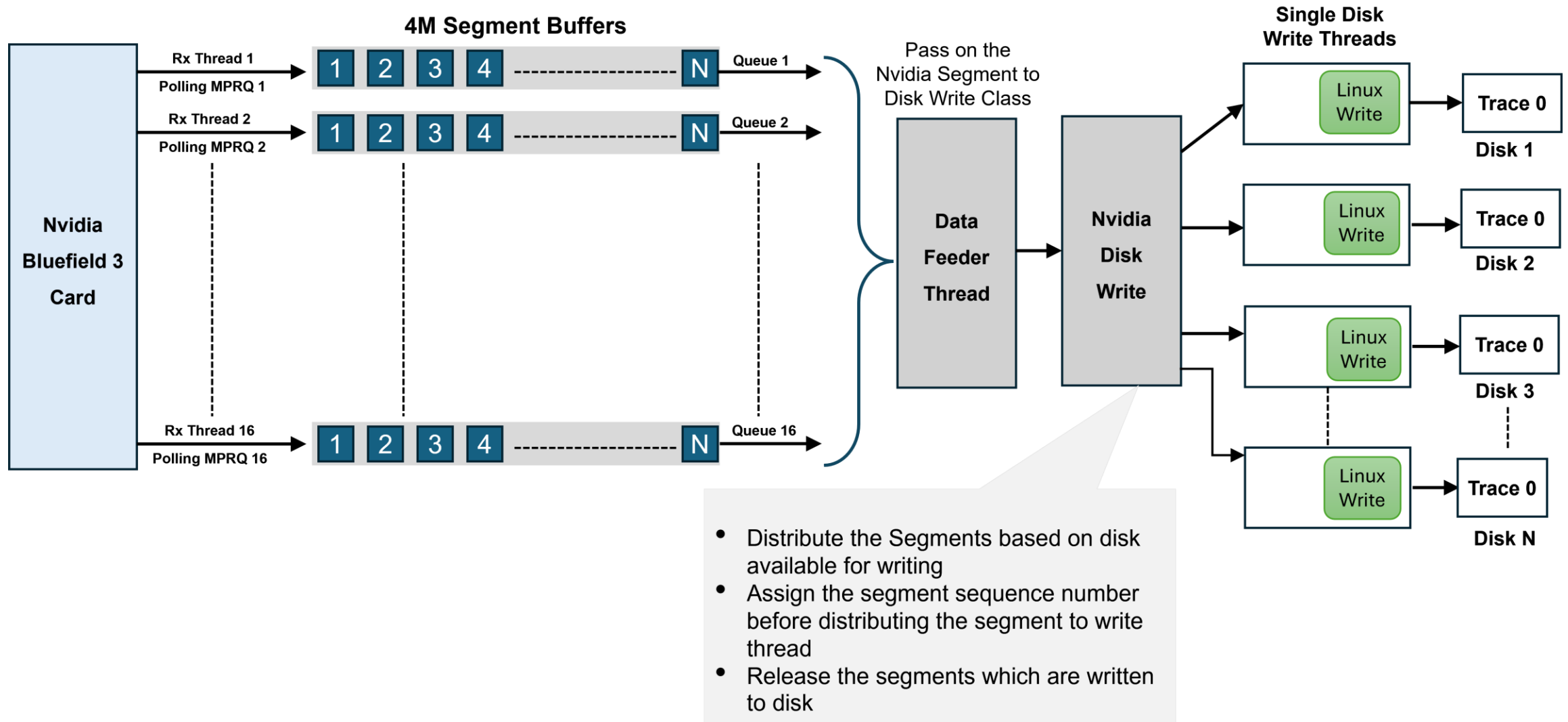
- The FastRecorder™ 400 G web interface enables users to access multiple servers within the same LAN, allowing seamless connectivity and centralized management of multiple devices for improved efficiency and control

Dual Processor 400 G Capture System

- Customizable Storage up to 20 NVME SSDs (Each up to 30 TB)
- Capture rate to SSD 100 GBytes/sec
- Up to 4 x 400 G Ports
- Linux OS
- Redundant Power Supply
- Ethernet Port for Remote Access



FastRecorder™ Architecture



FastRecorder™ Main Window (Web Interface)

GL Communications | FastRecorder™ & PacketExtractor™

Welcome Back!

Sign in to continue

Login

Username

admin

Password

..|

Login

FastRecorder™ Server

Servers

Load

Save

Server Name

Server2

IP Address

192.168.30.107

Fast Recorder Port

4444

Extractor Port

5555

+ Add Server

Server1



IP Address

192.168.30.122

FastRecorder Port

4444

PacketExtractor Port

5555

Server Status

FR Active

PE Active

Click on [Dashboard](#) Menu to continue.

FastRecorder™ Configuration GUI

GL Communications | FastRecorder™ & PacketExtractor™

Dashboard

Servers

Event Log

Admin

Fast Recorder

PacketExtractor

Fast Recorder

Stopped

Server1

Start

Drive Info

Configuration

Hardware Filter

Statistics

Graph

Fast Recording Configuration

Recording Name

FRREC

Total Record Limit

Stop After

Keep Latest

40

GB

Network Adapter :

Port No	Link Speed	Capture	Port Drive Info
Port_0	400Gb/s	<input checked="" type="checkbox"/>	Drive
Port_1	400Gb/s	<input checked="" type="checkbox"/>	Drive

Driver Information

Port_0 Drive Info		✕
Drive Path	Free Space	
<input checked="" type="checkbox"/> /media/gl/D/	4207 GB	
<input checked="" type="checkbox"/> /media/gl/E/	4392 GB	
<input checked="" type="checkbox"/> /media/gl/F/	4432 GB	
<input checked="" type="checkbox"/> /media/gl/G/	4421 GB	
<input checked="" type="checkbox"/> /media/gl/H/	4422 GB	
<input checked="" type="checkbox"/> /media/gl/I/	4385 GB	
<input checked="" type="checkbox"/> /media/gl/J/	4335 GB	
<input checked="" type="checkbox"/> /media/gl/K/	4480 GB	

Port_1 Drive Info		✕
Drive Path	Free Space	
<input checked="" type="checkbox"/> /media/gl/L/	7096 GB	
<input checked="" type="checkbox"/> /media/gl/M/	7096 GB	
<input checked="" type="checkbox"/> /media/gl/N/	4456 GB	
<input checked="" type="checkbox"/> /media/gl/O/	4297 GB	
<input checked="" type="checkbox"/> /media/gl/P/	4485 GB	
<input checked="" type="checkbox"/> /media/gl/Q/	4432 GB	
<input checked="" type="checkbox"/> /media/gl/R/	7096 GB	
<input checked="" type="checkbox"/> /media/gl/S/	7096 GB	

Hardware Filters

- Set up filters to capture traffic of interest only
- Filters can be modified during run-time
- In this example, the specified **IPv4** address is filtered

The screenshot displays the GL Communications FastRecorder & PacketExtractor software interface. The main window shows the 'Fast Recorder' tab, which is currently 'Stopped'. A 'Filter Field' dialog box is open, allowing the user to configure a filter. The dialog has a left pane with a tree view of filter categories: Filters, MAC, Ether Type, VLAN0, Tag Protocol ID, VLAN ID, IP(IPv4/IPv6), IP Address, IPv4, Protocol Type, Differentiated Service, IPv6, Next Header, TCP, Source Port, Destination Port, and UDP. The 'IP Address' category is selected. The right pane, titled 'Value', shows the configuration for the selected filter. It includes a dropdown for 'IP List Type' set to 'IP Address List', a dropdown for 'IP Type' set to 'IPv4', and a text input for 'IP Address' containing '192.168.1.23'. Below this, a blue bar highlights the 'IP Address' value '192.168.12.22' with a menu icon. A green 'Add Filter Field' button is in the top right corner of the dialog.

400 G General Statistics

- **Record Duration (hh:mm:ss):** Total recording duration in hours, minutes, and seconds
- **L2 Rx Rate (Gbps):** Total capture rate of all selected ports on the capture interface in gigabits per second
- **Record Rate (Gbps):** Total record rate of all selected ports on the capture interface in gigabits per second
- **Capture Frame Rate (Frames/Sec):** Total number of frames received per second on the capture interface
- **Total Captured Frames:** Total number of frames recorded during the capture session
- **Dropped Frames:** Number of frames that were not captured due to buffer limitations or other constraints
- **Dropped Segments (Slow Disks):** Number of segments lost due to insufficient disk write speed
- **Recorded Bytes (Gbytes):** Total number of bytes recorded in the current session, measured in gigabytes

General Statistics

Description	Value
Record Duration (hh:mm:ss)	00:42:42
L2 Rx Rate (Gbps)	750.71
Record Rate (Gbps)	814.90
Capture Frame Rate (Frames/Sec)	183,405,349
Total Captured Frames	467,510,484,992
Dropped Frames	0
Dropped Segments (Slow Disks)	0
Recorded Bytes (Gbytes)	222,926.316 GB

400 G Port Statistics

- **Port Link Status:** Port “Link Up” or “Link Down” status
- **Total Received Frames:** Total number of frames successfully received on the capture interface during the recording session
- **L1 Rx Rate (Gbps):**

$$\text{L1 Rx Rate} = [\text{Bytes/sec} + (\text{Packets/sec} \times 20)] \times 8$$
 20 byte = 12 byte (interframe gap) + 8 byte (preamble)
- **L2 Rx Rate (Gbps):** Total capture rate of all selected ports on the capture interface in gigabits per second

$$\text{Bytes} = \text{Ethernet header} + \text{FCS}$$

$$\text{Capture Rate} = [\text{Bytes/sec}] \times 8$$
- **Capture Frame Rate (Frames/Sec):** Total number of frames received per second on the capture interface
- **iMissed [RX Queue Overflow]:** Number of missed packets due to receive queue overflow (driver statistic)

Port Statistics			
Description	Aggregate	Port-0 ▼	Port-1 ▼
Port Link Status	NA	Link Up	Link Up
Total Received Frames	235,898,554,292	118,112,509,112	117,786,045,180
L1 Rx Rate (Gbps)	795.17	397.62	397.56
L2 Rx Rate (Gbps)	783.81	391.93	391.87
Capture Frame Rate (Frames/Sec)	76,522,520	38,264,034	38,258,486
iMissed [RX Queue Overflow]	0	0	0
iErrors [Corrupted Packets]	0	0	0
Packet Discards [Hardware-Level Drop]	0	0	0
CRC Errors	0	0	0
FRAME-LENGTH COUNTERS			
64 Byte	0	0	0
65-127 Byte	480	251	229
128-255 Byte	0	0	0
256-511 Byte	466	238	228
512-1023 Byte	0	0	0
1024-1518 Byte	237,711,920,490	119,019,186,830	118,692,733,660
1519-2047 Byte	0	0	0
2048-4095 Byte	0	0	0
4096-8191 Byte	0	0	0
8192-Max Byte	0	0	0

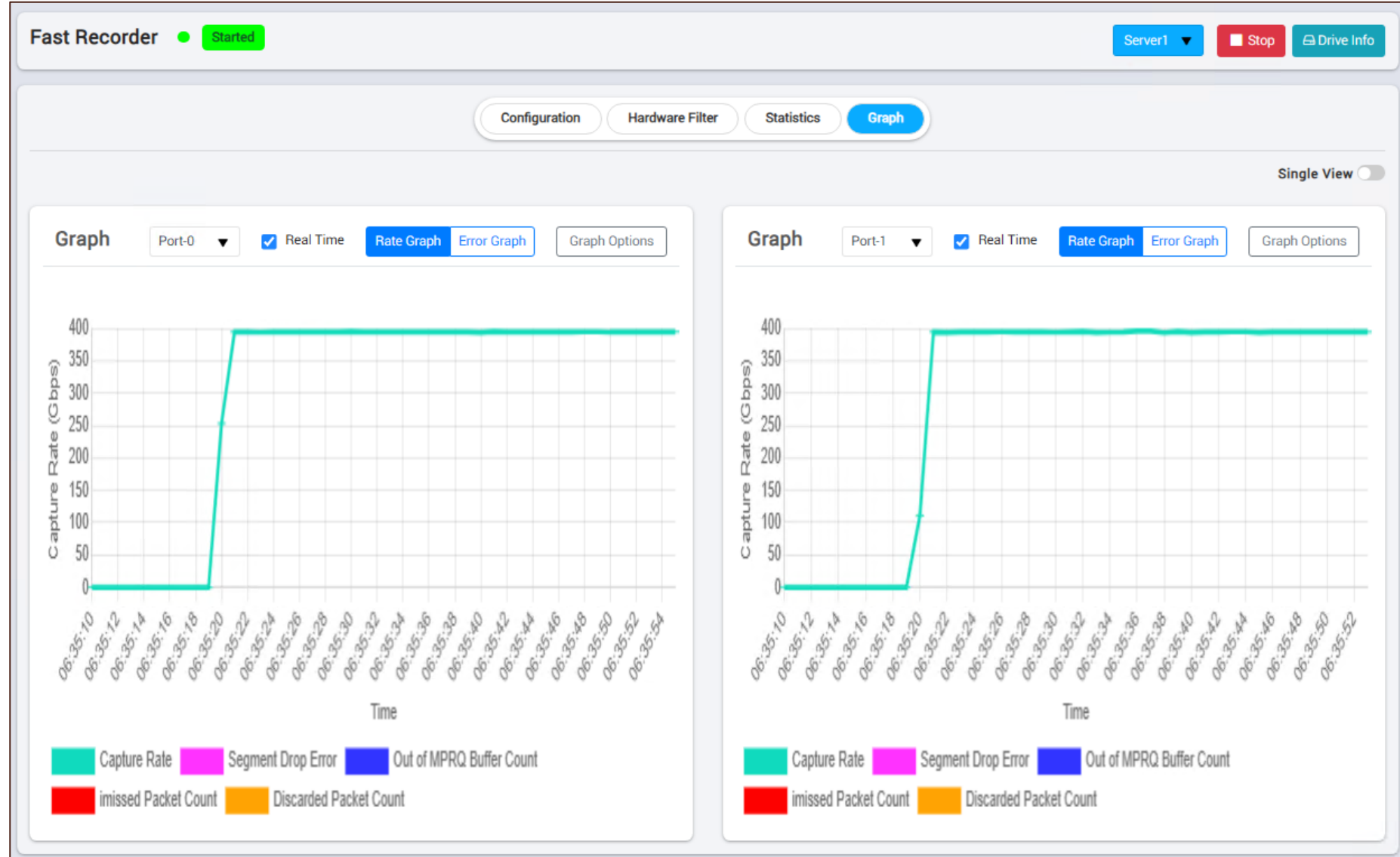
400 G Port Statistics (Contd.)

iErrors [Corrupted Packets]	0	0	0
Packet Discards [Hardware-Level Drop]	0	0	0
CRC Errors	0	0	0
FRAME-LENGTH COUNTERS			
64 Byte	0	0	0
65-127 Byte	480	251	229
128-255 Byte	0	0	0
256-511 Byte	466	238	228
512-1023 Byte	0	0	0
1024-1518 Byte	237,711,920,490	119,019,186,830	118,692,733,660
1519-2047 Byte	0	0	0
2048-4095 Byte	0	0	0
4096-8191 Byte	0	0	0
8192-Max Byte	0	0	0

- **iErrors [Corrupted Packets]:** Number of packets received with errors due to corruption
- **Packet Discards [Hardware-Level Drop]:** Number of packets dropped at the NIC's hardware ring buffer due to lack of buffers for DMA operation towards application
- **CRC Errors:** Number of packets with cyclic redundancy check (CRC) failures due to transmission errors
- **FRAME-LENGTH COUNTERS:** Number of frames captured within specific byte length ranges for traffic analysis

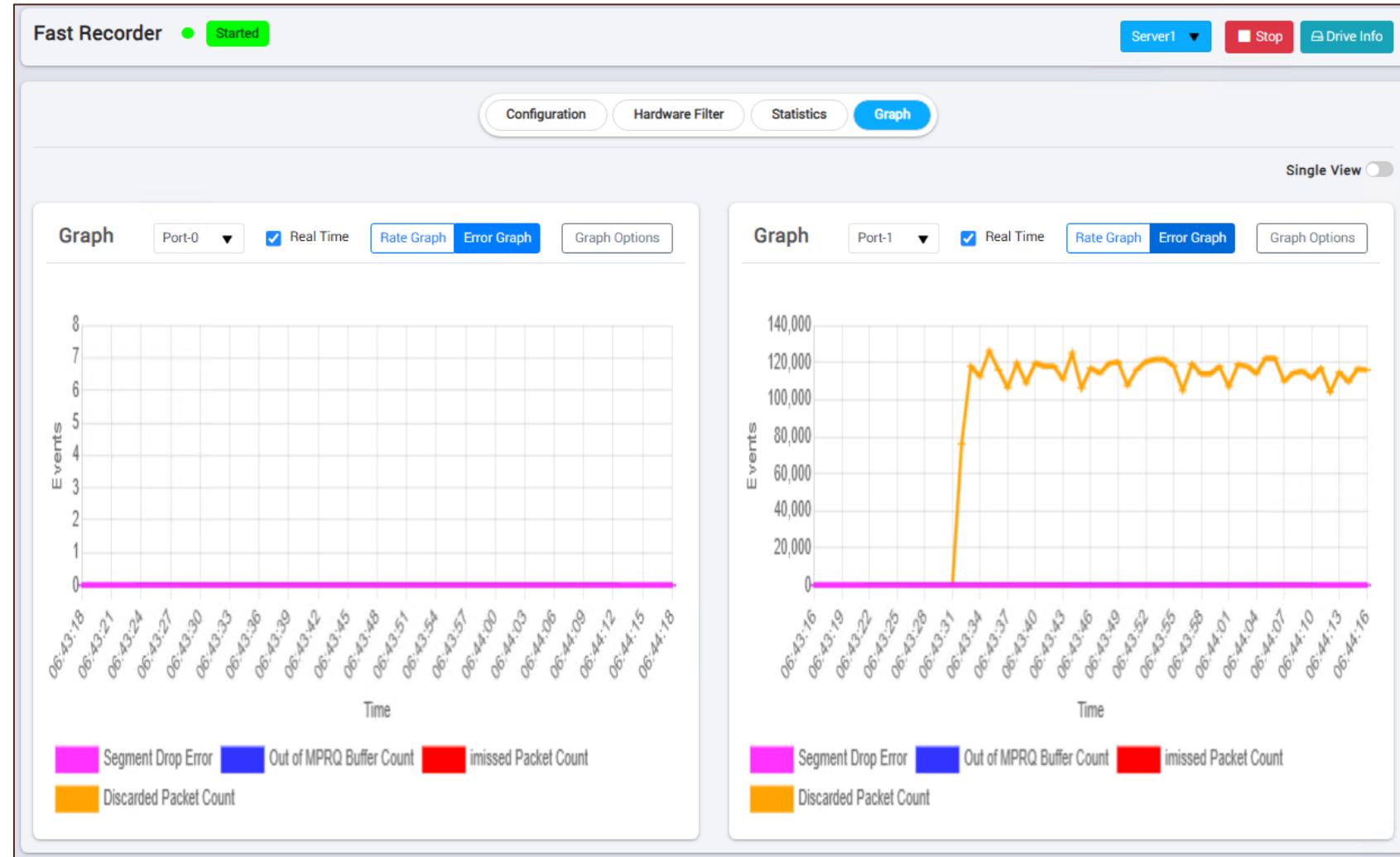
FastRecorder™ - Rate Graph

- Provides two types of graphs **Rate Graph** and **Error Graph** for each port
- The **Rate Graph** shows the capture rate of a recorded or ongoing recording file and indicates errors detected at a specific instance during capture or recording

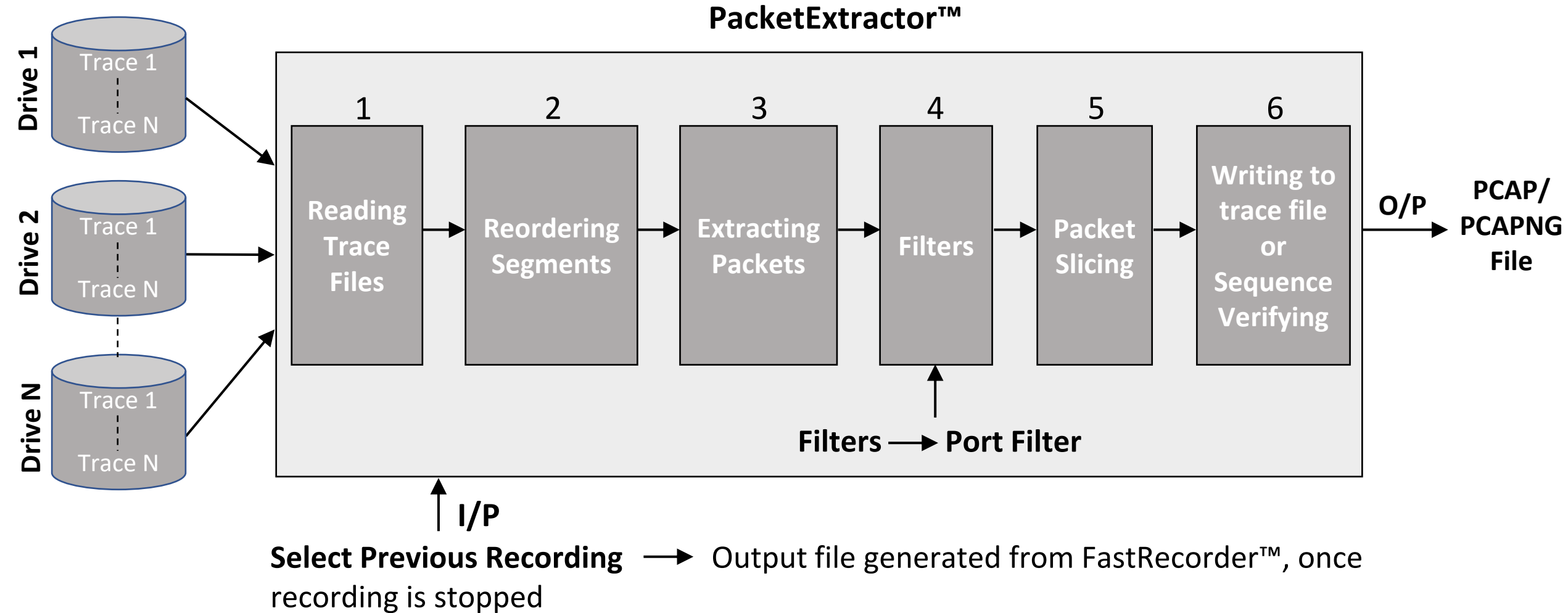


FastRecorder™ - Error Graph

- The **Error Graph** displays errors that occurred on each port during recording or in a recorded file
 - **Segment Drop Error** – Indicates packet drops due to slow disk performance
 - **Out of MPRQ Buffer Count** – Number of packets lost due to insufficient MPRQ buffers, this occurs that disk write has consumed all the available 4MB (made up of multiple MPRQ buffers) and NIC doesn't have any of these left to DMA the incoming frames
 - **iMissed Packet Count** – Number of packets dropped because the MPRQ queue overflow, this indicates the sluggishness at application in picking the MPRQ buffers from NIC
 - **Discarded Packet Count** – Captures packets that were dropped at the NIC's hardware ring buffer due to lack of MPRQ buffers for DMA operation towards application



PacketExtractor™ Architecture



PacketExtractor™

- **Targeted Packet Extraction:** Extract specific traffic from previous recordings into PCAP and PCAPNG (Wireshark® format) output traces
- **Post-Extraction Analysis:** Analyze the extracted trace in PacketScan™ HD or Wireshark®
- **Flexible Output Trace Options:** Extract packets into a single or multiple output traces
- **Conditional Extraction Filters:** Extract traces based on file size, time period, or packet count limit
- **Time-Based Extraction:** Perform extraction from user-specified start and end times
- **Recording Status Indicator:** Provides Recording Status options as Complete or Partial
- **Packet Slicing for Efficiency:** Slice packets to a limited length to optimize output trace size
- **Extraction Metrics and Reporting:** Provides detailed insights into the extraction process, including frame count, data volume, processing and extraction rates, and total duration for efficient traffic analysis

PacketExtractor™ Configuration GUI

- Enables efficient extraction of recorded network traffic with flexible filtering and export options
- Configure time limits, apply filters, and select specific ports for targeted extraction
- Supports packet slicing, multiple file exports, and compression, with output saved in PCAP format for analysis

The screenshot displays the PacketExtractor Configuration GUI. At the top, the header includes 'GL Communications | FastRecorder™ & PacketExtractor™' and navigation links for 'Dashboard', 'Servers', 'Event Log', and 'Admin'. Below the header, the 'Fast Recorder' tab is active, and the 'PacketExtractor' status is shown as 'started' with a green indicator. A 'Server1' dropdown and a 'Select Recording' button are also present.

The main configuration area is divided into two tabs: 'Configuration' (selected) and 'Statistics'. The 'Configuration' tab contains several sections:

- Recording Information:** A table showing recording details.

Recording Information	
Name	FRREC
Start Time	2025-03-07 04:54:30
End Time	2025-03-07 05:07:31
Record Duration	00:13:01
Record Size	69 503.895 GB
- Configuration:** A section with a 'Stop' button and sub-sections for 'Time Criteria' and 'Limit Criteria'.
 - Time Criteria:** Includes 'Start Time' (04:54:30) and 'End Time' (05:07:31) input fields.
 - Limit Criteria:** Includes radio buttons for 'All Frames', 'Extracted Size', 'Duration', and 'Extracted Packet Count'. A summary 'All Criteria' is shown below.
- Port Filter:** Includes 'Recorded Ports' (0, 1) and a 'Filter' input field with an example: 'Example: 0 or 0-3 or 1,2,3 or 2-7'.
- Operation:** Includes a 'Select' dropdown (Packet Extraction), checkboxes for 'Packet Slicing', 'Multiple Files', and 'Compress Extracted Files', and a 'Destination File Name' section with a path '/media/gl/L/ExtractedTrace/' and a filename 'test1' in 'pcap' format.

Extraction Statistics

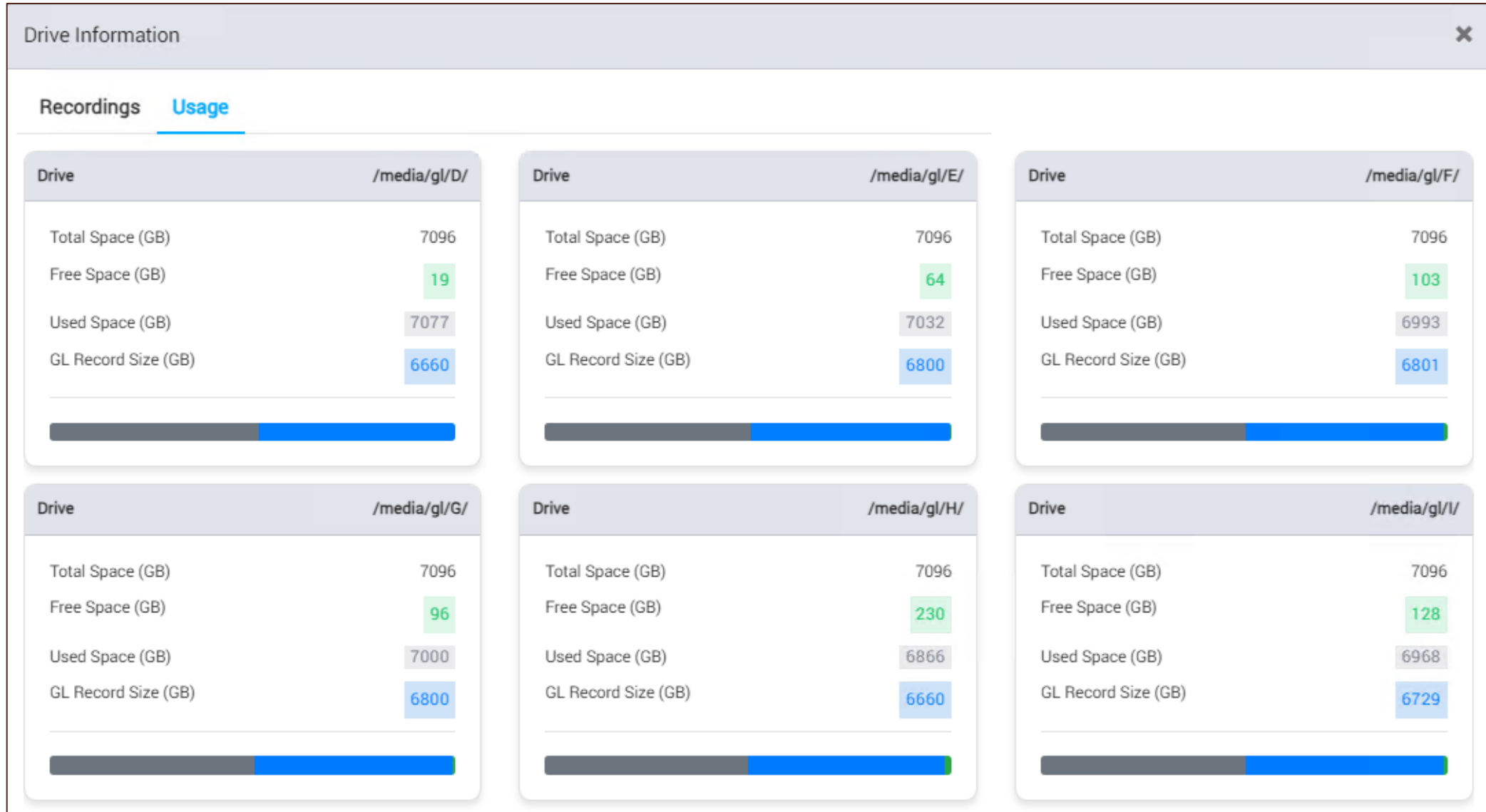
- **Processed Frames:** The total number of frames analyzed during the extraction process
- **Extracted Frames:** The number of frames successfully extracted from the processed frames
- **Processed Bytes (MB):** The total amount of data processed, measured in megabytes
- **Extracted Bytes (MB):** The total amount of extracted data, measured in megabytes
- **Processed Frames/Sec:** The rate at which frames are processed per second
- **Extracted Frames/Sec:** The rate at which frames are extracted per second
- **Processed Rate (Mbps):** The speed at which data is processed, measured in megabits per second
- **Extracted Rate (Mbps):** The speed at which data is extracted, measured in megabits per second
- **Duration (mm:ss):** The total time taken for extraction, displayed in minutes and seconds

Extraction Statistics	
Description	Value
Processed Frames	84 349 862
Extracted Frames	84 349 862 (100.00 %)
Processed Bytes (MB)	121 467.867
Extracted Bytes (MB)	121 467.867
Processed Frames / Sec	519 372
Extracted Frames / Sec	519 372
Processed Rate (Mbps)	6 274.014
Extracted Rate (Mbps)	6 274.014
Duration (mm:ss)	2::37

Drive Info - Recordings

Drive Information			×
<div>RecordingsUsage</div>			
Record Name	Record Size (GB)		
FRREC	69503	D/GL_0,D/GL_1,E/GL_0,E/GL_1,F/GL_0,F/GL_1,G/GL_0,G/GL_1,H/GL_0,H/GL_1,I/GL_0,I/GL_1,J/GL_0,J/GL_1,K/GL_0,K/GL_1,L/GL_0,L/GL_1	
Test1_VariableLen_KL_40Tb	40000	D/GL_0,D/GL_1,E/GL_0,E/GL_1,F/GL_0,F/GL_1,G/GL_0,G/GL_1,H/GL_0,H/GL_1,I/GL_0,I/GL_1,J/GL_0,J/GL_1	

Drive Info - Usage



Thank you