

Release Notes for FastRecorder™ and Playback™ version 25.2.18

FastRecorder™:

- Lossless wirespeed capture of IP traffic across high speed (10, 25, 40, 100 GigE) links
- Non-intrusive capture and record over Ethernet (Electrical and Optical) interfaces at Nano-second time precision
- Recording on multiple ports by merging the traffic with high-precision timestamp
- Up to 240 TB of total storage (NVME SSD) in the portable platform
- Supports recording on multiple devices to achieve up to 320Gbps capture
- Record only traffic-of-interest by applying efficient hardware filters based on MAC, 802.1Q (VLANs), IPv4/IPv6, TCP, UDP, SCTP, SIP, and RTP parameters
- Support filtering on the inner layer of GTP tunnel traffic such as inner IPv4/IPv6 addresses and UDP/TCP port address
- Slice packets to limited length to store only important packet content
- Optimized distributed disk operation to achieve the line rate traffic recording to disk
- Option to record traffic continuously by retaining the latest traffic with user defined record size
- Provides aggregated and per port statistics such as captured, filtered/unfiltered, dropped frame percentage and counts
- Provides options to list and delete the previously recorded data
- Overwriting of previous recording is supported

PacketExtractor™:

- Extract intended traffic from previous recordings into PCAP, PCAPNG (Wireshark® format), or HDL (GL Proprietary format) output traces
- Extracted trace can be analysed using PacketScan™ HD (HDL file format) or Wireshark® (pcap file format)
- Supports extraction of "Partial Recorded" data because of power failure or PC restart
- Provides options to extract the packets into single or multiple output traces
- Extraction filter provides options like GTP-IP and GTP-UDP filtering, IP, TCP, UDP, VLAN, IP (All Levels), ESP and other filtering options.
- Supports extraction based on the file size, time duration or packet count as limit criteria
- Packets can be sliced to limited length to optimize output trace size
- Traffic of interest can be extracted for a given time duration to focus on network issues
- Extraction of certain port traffic can be done by applying port filter
- Provides option to compress extracted trace files using 7-Zip to optimize the storage
- eCPRI Protocol analysis supports eCPRI message types such as Sequence Analysis for IQ Data, Bit Sequence and Generic Data Transfer. Also supports Remote Memory Access, One-way Delay Measurement, Remote Reset, and Event Indication for analysis and statistics.
- PacketExtractor™ is enhanced to support Data Analysis for "Recorded Port statistics", "L3 Protocols", "L4 Protocols", "Class of Services", "IPv4 Endpoints", "IPv4 Conversations", "IPv6 Endpoints", "IPv6 Conversations", "TCP Endpoints", "UDP Endpoints", "UDP Conversations", "TCP Conversations", "SCTP Conversations" and "PING Conversations" with support for applying a filter and "Display Graph" for Packet rate and Data rate.
- PacketExtractor™ is enhanced to support Rate Analysis at Milliseconds precisions and Microseconds precisions graph for "Packet rate" and "Data rate" on individual recorded port.

Description of Enhancements	Version
Bug Fixes: FastRecorder™: <ul style="list-style-type: none">FastRecorder™ was crashing for long duration recording with triggers enabled. PacketRecorder™: <ul style="list-style-type: none">PacketRecorder™ was crashing when recording was started.	25.2.18
Bug Fixes: PacketExtractor™: <ul style="list-style-type: none">The minutes and seconds in the recorded duration for long-duration recordings are displayed incorrectly.Added default values for IPv4 and IPv6 fields in case of sanitization feature.	25.1.30
Enhancements: PacketExtractor™: <ul style="list-style-type: none">Ensure the recorded time-zone remains unchanged when extracting data in a different time-zone. Bug Fixes: FastRecorder™: <ul style="list-style-type: none">If StartFrMonitoring.bat is disabled in Startup Apps, reinstalling the FastRecorder™ and PacketExtractor™ executables does not reset its status. As a result, StartFrMonitoring.bat remains disabled, preventing FastRecorder™ from resuming after a system restart.After the first-time installation of FastRecorder™, the auto-login feature fails to function.	25.1.15
Enhancements: FastRecorder™: <ul style="list-style-type: none">The Port Event Log feature has been added to provide information about the port down count, down duration, and the down and up times for the last down event.FastRecorder™ periodically monitors the FastRecorderMonitoringApp to ensure it remains active and oversees FastRecorder™ during recording. If an issue occurs, the MonitoringApp restores FastRecorder and resumes the recording.	24.12.18
Enhancements: FastRecorder™: <ul style="list-style-type: none">Automated the Auto Resume functionality to ensure recording resumes automatically in case of an application crash or system restart during recording. Bug Fixes: PacketExtractor™: <ul style="list-style-type: none">Rate analysis of resumed recording is leading to crash.	24.11.22

<p>Enhancements:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">• Rate Analysis (Python Based) option is added in the FastRecorder™ graph statistics window. <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Enhanced to support Packet sanitization, to perform Header Sanitization and Payload Sanitization.<ul style="list-style-type: none">➤ Header sanitization: Mask the MAC and IP addresses in packet with configured start Address in incremental manner.➤ Payload Sanitization: Provides options to either Truncate bytes or Mask with Zero for all the payload bytes retaining the configured offset byte length. <p>Bug Fixes:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">• Resume recording on multiple cards was not functioning correctly in certain scenarios. <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Rate analysis of dual card resumed recording was hanging due to parameters not being reset when starting the extraction process.	24.10.28
<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• The data analysis process has been automated, allowing the workflow to start with a single click.<ul style="list-style-type: none">➤ "Apply as Filter" - Right-click on the selected row, choose 'Apply as Filter,' then select either the 'and' or 'or' condition, and apply the filter to the specific column. Additionally, the conditions 'and selected,' 'or selected,' 'and not selected,' and 'or not selected' are also supported.➤ "Prepare as Filter" - Right-click on the selected row, choose 'Apply as Filter,' then select either the 'and' or 'or' condition, and apply the filter to the specific column. Additionally, the conditions 'and selected,' 'or selected,' 'and not selected,' and 'or not selected' are also supported.➤ 'Pages': The current and total number of pages are displayed for each selected Statistics tab, with manual page navigation also supported.➤ Packet Filter: The filter history is accessible via the packet filter drop-down, allowing users to view the three most recent entries, along with default suggestions in the list box.➤ 'No data available' pop-up is displayed when there is no data for the selected statistics.➤ Alternate rows have been colourizing to improve user's readability➤ Pop-up warning window is displayed when the page number reaches either the first or last page.➤ Pop-up warning window is displayed when the user attempts to perform packet filtering while the progress bar is running.➤ SCTP Conversation graph has been supported.➤ Tree selection has been disabled if a statistics calculation is already in progress.	24.7.10

- Navigation space has been added to enable manual entry of the page number in the tab section.
- The option to paste has been added to the 'Packet Filter Box' via right-click.
- "Data Rate" has been selected as the default traffic rate in the data analysis graph.
- "Set rate threshold" - To set the rate threshold, enter the desired value and click the 'Set' button. This action will apply the threshold; while clicking the 'Unset' button will disable the rate threshold in data analysis graph.
- "Trace Record Date", "Sample Interval" and "Record Duration" have been introduced in a manner like Rate Analysis graph.
- "Capture Time," based on the "Time Granularity" and showing the bit/packet number, has been displayed, and an "Apply" button is also supported.
- All the buttons and dropdown menus are greyed out while the data analysis graph is loading.
- The tree name, tab name, and selected protocol are displayed on the data analysis graph for identification.
- Multiple graphs can now be generated under the same stats in data analysis.
- Offline Data Analysis and Rate Analysis feature has been integrated into the FastRecorder™ application.
- The Rate analysis graph process has been automated, allowing the workflow to start with a single click.
 - "Data Rate" has been selected as the default "Traffic Rate," and "Capture Port" has been set to '0' in the rate analysis graph.
 - To set the rate threshold, enter the desired value and click the 'Set' button. This will apply the threshold; while clicking the 'Unset' button will disable it in the rate analysis graph.
 - "Capture Time," based on the "Time Granularity" and showing the bit/packet number, has been displayed in rate analysis graph.
 - Offline rate analysis and microsecond resolution features have been added to the Fast Recorder application.
 - 'Pages': The current and total number of pages are displayed on the rate analysis graph.
 - 'No data available' pop-up is displayed when there is no data for the selected statistics. The 'Next,' 'Previous,' and 'Export to CSV' buttons should not be displayed in Alan's data analysis.
 - A pop-up window is displayed when the page number reaches the first or last page in Alan's data analysis.
- Ip Analytics process is now automated, allowing the workflow to start with just one click.

Bug Fixes:**PacketExtractor™:**

- **Data Analysis:**
 - 'Ports' has been renamed to 'Physical Port Statistics,' and 'Tunnel Protocol Statistics' has been renamed to 'Inner Protocol Statistics' in both data analysis.

<ul style="list-style-type: none">➤ Extra lines have been removed from the CSV file when the user saves the table using the 'Export Tab as CSV' button.➤ The previously selected statistics tab window is cleared or removed when the user selects a new statistics tab.➤ The Row ID is aligned to the left in both data analysis.➤ Tree selection is disabled when statistics calculation is already in progress. A progress bar has been added to prevent the 'not responding' mode when the user tries changes functionality.➤ The navigation bar is greyed out while the graph is loading, and the zoom button returns to its normal state when zoom is selected during a graph change. The "Next," "Previous," and page navigation buttons are disabled if only one page is available.	
<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• IO Graph is renamed as "Display Graph" and supports both Packet Rate and Data Rate.• Traffic Rate supported for "Packet rate" and "Data rate" with Time granularity of Seconds, Milliseconds and Microseconds interval.• Default Graph Duration/Page is increased to 10 minutes (600 000 msec).• Data Analysis Filter Expression syntax for Outer Protocol Statistics.<ul style="list-style-type: none">➤ eth.type, length, ip.dscp, ip.addr, ip.src, ip.dst, ip.proto, udp.port, udp.src, udp.dst, tcp.port, tcp.src, tcp.dst, port, sctp.port, sctp.src and sctp.dst• Data Analysis Filter Expression syntax for Tunneled Protocol Statistics.<ul style="list-style-type: none">➤ inner.ip.dscp, inner.ip.addr, inner.ip.src, inner.ip.dst, inner.ip.proto, inner.udp.port, inner.udp.src, inner.udp.dst, inner.tcp.port, inner.tcp.src, inner.tcp.dst, inner.sctp.port, inner.sctp.src and inner.sctp.dst <p>Bug Fixes:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Fixed Fragmented and Reassembled summary is not updating issue. <p>FastRecorder™:</p> <ul style="list-style-type: none">• Fixed Recorded files are getting deleted when running FastRecorder™ application for HDPacketDataAnalyzer.	24.5.17
<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Added "SCTP Conversations" to Data Analysis.• Added Animation to Progress bar while analysing Protocol Statistics.• PacketExtractor is enhanced to support Micro Resolution in Rate Analysis.<ul style="list-style-type: none">➤ Syntax usage: py -3.10 "HDF5 file path" time format➤ Specify time format as US for microseconds resolution➤ Specify time format as MS for milli seconds resolution• Specify time format as NS for nano seconds resolution, this is used only for HDF5 file generated from IpTcpUdpAn.	24.5.9

<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• PacketExtractor™ is enhanced to support Data Analysis for "IPv4 Conversations", "IPv6 Conversations" and "PING Conversations".<ul style="list-style-type: none">➢ PING Conversations provides statistics about "Echo ping Request" sent from "Address A" to "Address B" and "Echo ping Reply," received from "Address B" to "Address A".• Data Analysis supports Tunneled Protocol statistics for "Recorded Port statistics", "L3 Protocols", "L4 Protocols", "Class of Services", "IPv4 Endpoints", "IPv4 Conversations", "IPv6 Endpoints", "IPv6 Conversations", "TCP Endpoints", "UDP Endpoints", "UDP Conversations", "TCP Conversations" and "PING Conversations".• Data Analysis Filter Expression is changed as below and like Wireshark filter expression.<ul style="list-style-type: none">➢ eth.type, length, ip.dscp, ip.addr, ip.src, ip.dst, ip.proto, udp.port, udp.src, udp.dst, tcp.port, tcp.src, tcp.dst, port, sctp.src and sctp.dst• "L3 Protocols", "L4 Protocols" and "DSCP" Display protocol name along with decimal number.• Data Analysis statistics are separated by comma for more than three decimal places.• Rate Analysis is enhanced to support "Milli Seconds Precision" and "Microseconds Precision" in graph.<ul style="list-style-type: none">➢ Set in RATE_ANALYSIS_RESOLUTION flag in FastRecorderAndPlayBack.ini file to get Milli Seconds or Microseconds precision in Rate Analysis➢ RATE_ANALYSIS_RESOLUTION = 1 for "Milli Seconds Precision" and RATE_ANALYSIS_RESOLUTION = 2 for "Microseconds Precision"• Rate Analysis graph displays the actual capture time when hovering the mouse over the graph.• Rate Analysis displays "Trace record date," "Record Duration," "Capture Ports" and "Total Packets" counts.• Added "Set Rate Threshold" option to Rate Analysis which allow user to define a Threshold value to display the horizontal line across y axis so that user can easily see rates going beyond the line.• 7z compression: Added an option to allow password protection for encrypted compressed files.• 7z compression is changed to Ultra compression method for better results.• "Processed Rate" and "Extracted Rate" value is separated by blank space for more than three digits.	<p>24.5.8</p>
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<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• PacketExtractor™ is enhanced to support Data Analysis using Python version 3.10<ul style="list-style-type: none">➢ IP Analytics for "L3 Protocols", "Class of Services", "L4 Protocols", "IPv4 Endpoints", "IPv6 Endpoints", "TCP Endpoints", "UDP Endpoints", "Recorded Port statistics", "UDP Conversations" and "TCP Conversations".➢ Supports IO Graph for Bits/sec and Packets/sec.➢ Filtering support for mac_protocol_type, cos, ip_protocol, ip_address, tcp_port, udp_port, port (Recorded port number), east_ip, west_ip, east_port and west_port➢ Supports exporting all Tabs information ("L3 Protocols", "Class of Services", "L4 Protocols", "IPv4 Endpoints", "IPv6 Endpoints", "TCP Endpoints", "UDP Endpoints", "Recorded Port statistics", "UDP Conversations" and "TCP Conversations") to CSV file format.➢ Supports exporting specific tab information to CSV file format.➢ Option to select single Data Analysis *.HDF5 file or selecting multiple *.HDF5 files from the folder.➢ Supports sorting the columns in Ascending order or Descending order.• PacketExtractor™ is enhanced to support Rate Analysis.<ul style="list-style-type: none">➢ Syntax usage: py -3.10 "HDF5 file path" timeformat➢ Time format can be specified as MS for FastRecorder generated HDF5 file and timeformat can be specified as NS for IpTcpUdpAn generated HDF5 file➢ Supports IO Graph for "Bits/Sec" (Mbps, Kbps and bps), "Packets/Sec" for individual recorded port and overall recorded port for HDF5 file created using IpTcpUdpAn application.• Added IpTcpUdpAn.exe to installation folder<ul style="list-style-type: none">➢ Takes HDL file as an input and generates CSV file for IP Analytics (Data Analysis) and Rate Analysis➢ Exports analysed results to CSV file with name as "ByPort.csv," "Main.csv," "SumAllIfcPerPeriod.csv" and "SumPerIfcPerPeriod.csv"➢ Main.csv used for Data Analysis and contains information's for Ifc, Mac Protocol type, VLAN ID, COS, IP Protocol, Source IP Address, Destination IP Address, Source Port, Destination Port, Packets counts and Bytes counts.➢ SumPerIfcPerPeriod.csv used for Rate Analysis of individual recorded port/s.➢ SumAllIfcPerPeriod.csv used for Rate Analysis of overall recorded port/s.	24.3.11
<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Enhanced Extraction Filter for ESP protocol.<ul style="list-style-type: none">➢ Wildcard support for IP address and SPI values in ESP SAs configuration.➢ ESP over UDP Deciphering	24.1.25

Bug Fixes: PacketExtractor™: <ul style="list-style-type: none">Record size available is not matching with size occupied on diskFixed PacketExtractor™ statistics issue where the counts were not matching when extracting few packets	23.12.13
Enhancements: FastRecorder™: <ul style="list-style-type: none">Time Synchronization support for 1/10G Adapter. PacketExtractor™: <ul style="list-style-type: none">Extractor statistics is changed to tabular form. Bug Fixes: PacketExtractor™: <ul style="list-style-type: none">Renaming of multi card recording is failing in some cases.Extraction of multi card recording in case of low-rate recording was failing for one of the cards.	23.9.22
Enhancements: FastRecorder™: <ul style="list-style-type: none">Added Source MAC Address hardware filter.Added Destination MAC Address hardware filter.<ul style="list-style-type: none">➤ MAC Address Hardware filter supports adding a Single MAC Address, Multiple MAC Address (Comma Separated), MAC Range Value and MAC Masking filter. PacketExtractor™: <ul style="list-style-type: none">Source MAC, Destination MAC support in Pre-Extraction filter.Added MAC Range and Mask support in Pre-Extraction filter. Bug Fixes: FastRecorder™: <ul style="list-style-type: none">Fixed FastRecorder™ "Auto Startup" issue when application started from Task Scheduler. PacketExtractor™: <ul style="list-style-type: none">Fixed BERT Verification issue when Bert Verification fail issue application started from Task Scheduler.	23.9.11

<p>Enhancements:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">Added ability to resume the recording upon PC restart.Added "Graph Click point" option to get Timestamp and Rate information in Graph View.Now "Save Configuration" supports saving more than 32 IP-Pair Address in Pre-Defined filter. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Added "Time Info" option for resumed recorded files, Time Info gives information about "Recording Down Time" and "Recording Up Time." <p>Bug Fixes:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">Fixed hardware filter operator selection issue in Advance filter.Fixed Send mail issue for office365. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Fixed Pre-Extraction filter issue for Outer, Tunnel1 and Tunnel2 TCP Port filter.Fixed Crash issue for extracting the packets which has recorded using more than 32 IP-Pairs address using pre-defined filter.	23.8.14
<p>Enhancements:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">Supports Time Synchronisation configuration on NT200A02 multi cards system. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Record size displays as "Partial Recording" for interrupted recorded file. <p>Bug Fixes:</p> <p>Hardware Filter:</p> <ul style="list-style-type: none">Fixed application crash issue when deleting filter fields.Fixed "ARP IP Address Mask" Filter issue. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Fixed "Partial Recording" extraction issues.Fixed MetaFile load issue in case of Partial RecordingFixed "Recorded file" loading issue when using Search option to select "Recorded File."Fixed "Pre-Extraction" filter issue for SIP TCP Port Tunnel2 fields	23.7.14
<p>Enhancements:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">Supports recording on multiple devices to achieve 320Gbps capture.Added support for NT20E3-2-PTP card.Recorder Statistics and Historical Graph supports for up to 32 ports.Optimized usage of "Rx Host Buffer Size" while recording at higher speed. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Supports extraction of Recording which is interrupted in between because of power failure or PC restart.Record State displays as "Complete" or "Partial."	23.6.9

<ul style="list-style-type: none">Recorder Statistics and Historical Graph support for up to 32 ports.Renaming "Recorded file Name" to user defined name. Bug Fixes: PacketExtractor™: <ul style="list-style-type: none">Fixed higher CPU Utilisation while extracting the recordings.	
Enhancements: PacketExtractor™: <ul style="list-style-type: none">Limit Criteria in extractor is verified against extracted packet count/size rather than read packet count/size.Added Extraction Filter for VLAN, IP (All Levels) and ESP packets.Supports filtering of VLAN fields such as "VLAN Tag," "VLAN ID," "VLAN Priority" value.Supports IP all level filtering (When configured, IP Address will be filtered from all layers).By default, IP reassembly is disabled and option to enable "Reassemble IP Datagrams" is available under IP (All Levels) field.Added filtering "All ESP Data"Added option to decode Encrypted ESP Payload.Supports Deciphering of ESP Payload based on the "ESP SAs" configurations.<ul style="list-style-type: none">➤ Provided option to Save/Load ESP SAs configurations, Configurations are saved with extension *.espa.ESP Packets can be extracted by retaining "Original Encrypted Payload."Added option to filter ESP Packets based on the "SPI" Value. Bug Fixes: PacketExtractor™: <ul style="list-style-type: none">GUI Fixes in PacketExtractor™ Statistics, Statistics were truncated on display resolution 1366x768.	23.2.7
Enhancements: FastRecorder™: <ul style="list-style-type: none">Added SendMail option as one of the actions along with disk write in Trigger and Action feature.Added PortLinkStatus as one of condition for Trigger and Actions.Global setting for SendMail Option and GraphHistory Duration.PortLink Down status for all selected ports is also provide in the OverAll graph.Added Zoom-In and Zoom-Out option in graph view. Bug Fixes: FastRecorder™: <ul style="list-style-type: none">Application crash issue while loading the saved Configuration.Fixed Custom Email Message for Email Trigger option.	22.12.13

<p>Enhancements:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">• In Configuration window along with port status and port number, SFP type and negotiated speed is included for each port.• Added L1\L2 error counters in List view of statistics. <p>Hardware Filter:</p> <ul style="list-style-type: none">• Handling IPv6 Next Header filter for fragmented and non-fragmented packets. <p>Bug Fixes:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">• Fixed spike issue in graph which was observed during long run. <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Extractor was going to non-responding state for recording which has ON and OFF traffic or very less input traffic rate.• Pre-Extraction filter support for custom filter expression of advance filter.	22.11.18
<p>Enhancements:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">• Allowing to start the Recording without giving the recording name, in this case current time is taken as recording name in following format "YYYY-MM-DD_HH-Min-Sec."• Option to view the graphical representation of history of overall rate, frames/sec, per-port rate, per-port frames/sec, and port link status from the record start time to end time in Statistics tab.• Trigger based record start/stop, triggering condition is configured based on CaptureRate, FilterRate, per-port CaptureRate, per-port FilterRate. Also provides option to schedule the recording start/stop by setting triggering condition based on datetime/time format. <p>Hardware Filter:</p> <p>Advance Filter:</p> <ul style="list-style-type: none">• GUI is enhanced for adding field to filter and updating values of already added fields.• Based on added fields user can form their own filter using custom filter option and provides flexibility to the user to check the fields and use the logical conditions more efficiently. <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Option is provided to view the selected recording statistics as well as history of overall rate, frames/sec, per-port rate, per-port frames/sec, and port link status in the from the record start time to end time in the graphical in Statistics tab.	22.10.21

Enhancements: PacketExtractor™: <ul style="list-style-type: none"> • EndTime option is provided for Extraction. In the selected recording extraction can be done from user specified start to specified end time. 	22.9.26
Enhancements: <ul style="list-style-type: none"> • FastRecorder™/PacketRecorder™ is built with latest smart NIC library (package _12.8.1(driver version 3.26.2.4)). Bug Fixes: <ul style="list-style-type: none"> • In previous smart NIC library (package _12.7.8 (driver version 3.25.7.7)) ports link up issues when FEC is disabled is resolved. FastRecorder™: <ul style="list-style-type: none"> • Recording Name edit box size increased. • Saving Hardware filter configuration for respective recording is done, only when hardware filter is applied to that recording. • Minor GUI changes requested by AT&T. PacketExtractor™: <ul style="list-style-type: none"> • If the Recording name is more than 50 character was getting truncated when displaying in Recording Info section. • Crash due to GRE packets parsing, solved by handling optional header parsing. • By default, IP Reassembly is disabled for extraction filter. • eCPRIConfig ini is added to provide the option to the user to configure traction size for each event. • Minor GUI changes requested by customer. 	22.9.22
Enhancements: FastRecorder™/PacketRecorder™: <ul style="list-style-type: none"> • Added port link speed in per port statistics. 	22.8.26
Enhancements: PacketExtractor™: <ul style="list-style-type: none"> • Supports eCPRI Analysis in extractor operations. • eCPRI Analysis supports the following eCPRI message statistics. <ul style="list-style-type: none"> ➢ Sequence Analysis ➢ One-Way Delay ➢ Event Indication ➢ Remote Memory Access ➢ Remote Reset 	22.8.25
Enhancements: FastRecorder™/PacketRecorder™: <ul style="list-style-type: none"> • Application is supported on 3GA and 4GA cards for the latest smart NIC library (package _12.7.8). PacketExtractor™: <ul style="list-style-type: none"> • MemFileEx class is replaced by Sequence Read class for reading the recorded file for extracting the packets. 	22.8.4

<ul style="list-style-type: none">• Pre-Extraction Filter:<ul style="list-style-type: none">➢ Enhancement made to support Tunnel (1 and 2) filtering, eCpriMessage type filtering in case of both Advanced and Predefined hardware filters configuration.➢ Enhancement made to support latest SIP changes in Advanced filter.• PacketExtractor exe is included in FastRecorderAndPlayback folder user can extract the previously done recording while FastRecorder is recording new one. <p>Hardware Filter:</p> <p>Advance filter:</p> <ul style="list-style-type: none">• Enhanced to support eCPRI, different tunnelling types (VxLAN,GRE and GTP) and multiple tunnelling layer up to 2 tunnels.• Sip filters are also enhanced to support different L4 protocols (UDP, TCP and SCTP), different and multiple tunnelling. <p>Pre-Defined Filter:</p> <ul style="list-style-type: none">• New templates have been introduced, named as Tunnel1 Filter, Tunnel2 Filter, eCPRI Message Types, to filter out Tunnel1 and Tunnel2 Ip address, ports, and protocols, and eCPRI Message types over Mac and UDP.• In GTPTraffic Filter, template has been updated to work with latest enhancement of Tunnel Filters.• Utility is introduced to update old, saved configuration to new format according to Filter label and Description changes.	
<p>Enhancements:</p> <ul style="list-style-type: none">• FastRecorder™/PacketRecorder™ is builded with latest smart NIC library (package _12.7.8). <p>Bug Fixes:</p> <ul style="list-style-type: none">• Re-added Filter Not Match Frames in General statistics And Filter Match Frames && Filter Match Frames % in per port statistics when application is running in 100G mode as the stats asynch issue is fixed in the hardware level.• Predefined filters GUI Label changes: In all available Templates Descriptions for all filter has been changed to provide useful meaning• In template "GTPTrafficFilter" Filter display labels are changed as below<ul style="list-style-type: none">➢ Filter label "Inner or Outer IP Address" is changed to "Inner GTP or Outer Non-GTP IP Address"➢ Filter label "Inner or Outer IP Address Pair" changed to "Inner GTP or Outer Non-GTP IP Address Pair"	22.7.4
<p>Enhancements:</p> <p>PacketExtractor™:</p> <ul style="list-style-type: none">• Enhanced Pre-Extraction Filter in 2 stages<ul style="list-style-type: none">➢ Default Pre-Extraction Filter: Activated based on the hardware filter applied status in FastRecorder™.➢ Forced Pre-Extraction Filter: Optional, which can be activated and deactivate by the user.	22.4.8

<p>Bug Fixes:</p> <p>FastRecorder™/PacketRecorder™:</p> <ul style="list-style-type: none">Deleted Filter Not Match Frames in General statistics And Filter Match Frames && Filter Match Frames % in per port statistics when application is running in 100G mode.Capture Rate," "FilterRate," "FilterByte Percent," "CaptureFrm/sec", "FilteredFrm/sec" and "FilterFrame %" in General statistics will be set to 0 when there is no incoming traffic when recording is started, and it is set to 'NA' when recording stopped. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Extractor complete message will pop-up only when all the resourced are freed. <p>Hardware Filter:</p> <ul style="list-style-type: none">In SIP and ARP fields in Advance filter '!' '=' operator is removed.	
<p>Enhancements:</p> <p>FastRecorder™ Hardware filters:</p> <ul style="list-style-type: none">Hardware filter can be configured in 3 modes.<ul style="list-style-type: none">➤ 'No filter' (No Hardware filter Configured)➤ 'Predefined Filter' (Filter Templates is given, user can select the templates and provide values)➤ 'Advance Filter' (from the protocol fields supported user can form their own filters)In Advance filter SCTP, Inner UDP and Inner TCP fields are supported.IP Pair filter is supported for both inner (GTP) and Outer (Non-Gtp) layers. <p>PacketExtractor™:</p> <ul style="list-style-type: none">Extraction based on the captured port index by applying port filter. <p>PacketRecorder™-Hardware Filter:</p> <ul style="list-style-type: none">Only Advance Filter is supported in PacketRecorder™.In Advance filter SCTP, Inner UDP and Inner TCP fields are supported.IP Pair filter is supported for both inner (GTP) and Outer (Non-GTP) layers. <p>Bug Fixes:</p> <p>FastRecorder™:</p> <ul style="list-style-type: none">Disabling "Filter Not Match Frames" in "General statistics" and "Filter Match Frames," "Filter Match Frames %" in per port statistics only in 2x100G mode for NT200A02.Ip filter in hardware filter is not giving proper results.While overwriting previous recording residue files were remaining. <p>PacketRecorder™:</p> <ul style="list-style-type: none">Loading the previously saved configuration is leading to crash.Trace file open fail was not giving any error.	22.2.15