CATC IB*Tracer* 4X

InfiniBand Protocol Analyzer

The CATC IBTracer™ 4X is an InfiniBand Protocol Analyzer that advances validation and compliance testing for next generation InfiniBand silicon, switches and software. Supporting 4 wide 2.5 Gb/s dual-simplex connections, IBTracer 4X captures and displays InfiniBand traffic using the highly intuitive CATC Trace™ expert analysis software. The intuitive use of collapsible, color-coded packets to represent MADs, payloads and packets, provides IBTracer 4X with a high level of ease of use and understanding that is unsurpassed in the industry.

The CATC IB*Tracer* 4X Analyzer is a hardware plug-in module that installs into the CATC Universal Protocol Analyzer System™ (UPAS™ 10000). The heart of the IB*Tracer* 4X Analyzer is the CATC BusEngine™ protocol processor technology which uses state-of-the-art, field upgradeable FPGA technology.

With a real-time recording engine and configurable tools to manage and filter InfiniBand traffic, IB*Tracer* 4X makes sophisticated recording easy and powerful. The user can configure the depth of the recording memory up to 2 GB or use IB*Tracer*'s hardware triggering to isolate the most important protocol events. With true pre-capture filtering of routing headers, Virtual Lane IDs, Queue Pair and other criteria, IB*Tracer* 4X preserves recording memory and allows users to focus their analysis on the essential InfiniBand traffic.

Powerful search options allow users to find any combination of op-code, data pattern or QP address. Many of the most useful searches have already been indexed during upload. Use "point and click" to hide virtually every element within a trace including link packets and training sequences.

IB*Tracer* 4X includes many mechanisms to measure and report on InfiniBand traffic. For each sequence, you can see an absolute time-stamp, time-delta between sequential time-stamps, or idle time between packets on the same link. Traffic summaries include reports on timing calculations, error rates, operations and other statistical data. IB*Tracer* 4X also features graphical link utilization and throughput reports which provide a real-time visual indicator of activity on the link for troubleshooting and performance optimization.

CATC's Script Verification Engine is a documented API which allows third party applications to extract information from an IB*Tracer* 4X recording. It may be used to create "custom" scripts that automatically perform very complex calculations on recorded data. More than just an analyzer, IB*Tracer* 4X provides insight on how InfiniBand components work together and comply with the 4X specification.

For complete product information, please visit www.catc.com.

FEATURES	BENEFITS
• CATC Trace Expert Analysis Software	Faster interpretation and debug of InfiniBand silicon, components and networks
• Intelligent Triggering	Isolate important traffic, specific errors or data patterns
• Hardware Filtering	Faster analysis by removing non–essential fields from the trace
• Statistics and Traffic Summary	Quickly identify and track error rates, abnormal bus or timing conditions
• Collapsible / Expandable Headers	Increased drill–down detail for MADs, errors, payloads or individual packets
• Records and Displays Lane–to–Lane Skew	Faster analysis of multi–lane links
• Lane–Reversal Compatible	Trigger, record and display IB traffic logically regardless of the physical configuration of the lanes
• Display Skip Ordered–Sets	Improved troubleshooting shows actual skip ordered sets and flags violations
• USB 2.0 High–Speed Interface	Access recorded data up to 40x faster than USB 1.1
• 2 GB Recording Capacity	Capture long time windows for analysis and problem solving
• Tool Tips	Context sensitive descriptors improve understanding of the InfiniBand specification
• IB Spec 1.1 Compliant	Software option offers decoding of SPEC 1.1 MADs and transactions
• 13 Month Hardware Warranty	Protect your investment with industry leading warranty

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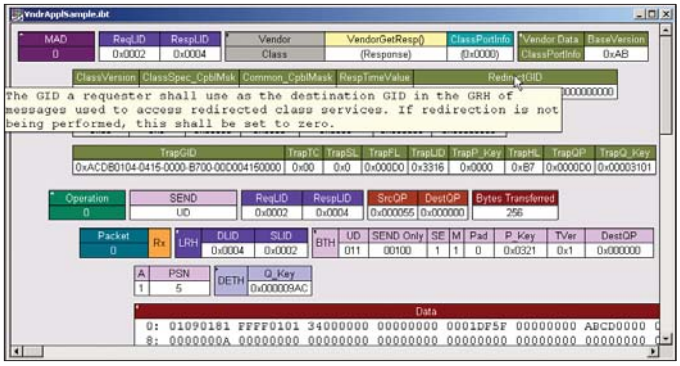
THE CATC TRACE

The CATC Trace expert analysis software is the de-facto industry standard for protocol analysis. Colors and graphics are used to represent trace elements in the context of the Protocol. The software displays every type of packet, Operation or Management Datagram on separate rows with every field labeled and verified for proper formatting. Users can quickly identify the area of interest and then click to drill down to view binary level details.

IB*Tracer* 4X automatically decodes MAD operations including the Subnet Administration transaction level, Sockets Direct Protocol level, and SCSI RDMA Protocol level. An optional software upgrade also decodes the new IB Specification v1.1 MADs and transactions. IB*Tracer* 4X uses a file-based scripting mechanism for decoding that can be modified with any text editor to display vendor-defined MAD content. This strong decoding engine matched with an easy-to-use interface provides faster interpretation and debug of InfiniBand protocol traffic.

For additional information on the CATC Trace, please download the White Paper from the CATC website: http://www.catc.com/support/whitepapers/index.html.



Tool Tips provide detailed information on every element within the trace to help users learn the protocol.

SPECIFICATIONS

Package

Dimensions: UPAS 10000:
12.2 x 12.2 x 3.5 inches (31.1 x 31.1 x 8.9 cm)
IB*Tracer* 4X Plug-in:
4.5 x 6.7 x 1.3 inches (11.3 x 17.0 x 3.2 cm)

Connectors: UPAS 10000: AC power connection
External trigger connection (TRIG IN/OUT, BNC)
PC connection (USB2.0, type "B")
IB*Tracer* 4X Plug-in: Recording Channel (8 pair MicroGigaCN)
Break-out-board (type "D")

Weight: UPAS 10000: 9.5 lbs (4.3 kg)
IB*Tracer* 4X Plug-in: 1 lb 11.4 oz (.77 kg)

Power Requirements

90-254 VAC, 47-63 Hz (universal input), 165W maximum

Environmental Conditions

Operating Range: 0 to 40°C (32 to 104°F)
Storage Range: -20 to 80°C (-4 to 176°F)
Humidity: 10 to 90%, non-condensing

Probing Characteristics

Connection: (8 pair MicroGigaCN)
Standard 4X cables per InfiniBand specification

Recording Memory Size

2 GBytes for trace capture, timing and control information

Host PC Software Requirements

Operating System: Windows 98SE®
Windows 2000®
Windows ME®
Windows XP®
USB 1.1 enabled (minimum required)
USB 2.0 (recommended)

Basic Trigger Conditions:

Training sequences
Connect/disconnect Link
Skew
Skip
All ordered sets
Data Packet
Link Packet
Header Fields
Header Patterns
– LRH
– BTH
– AETH
– RDETH
– DETH
– RETH
ImmDt Pattern
External Signals
MAD Pattern

Errors:

Invalid 10b codes
CRC Errors
Wrong running disparity of 10b codes
End of bad packet
Packet delimiter violations
Sync Overflow
Skew Error

Management Datagrams (MAD) Decodes

(Subn LID)	Subnet Management class (LID routed)
(Subn directed)	Subnet Management class (Directed route)
(SubnAdm)	Subnet Administration class
(Perf)	Performance Management class
(BM)	Baseboard Management class
(DevMgt)	Device Management class
(CommMgt)	Communication Management class
(SNMP)	SNMP Tunneling class
(Vendor)	Vendor Specific generic classes
(Application)	Application Specific generic classes
(DTA)	Device Test Application class
(SDP)	Sockets Direct Protocol
(SRP)	SCSI RDMA Protocol
(IB SPEC 1.1)	InfiniBand Specification v1.1 (additional cost)

LeCroy is a global leader in developing, manufacturing, and marketing electronic signal acquisition and analysis products and services.

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