Xgig® Analyzer for Ethernet and Fibre Channel

Xgig 10GE and 10GFC Multi-Function Blades

Key Benefits

- Provides actionable information about data storage issues that impact application availability and performance
- Generates traffic and errors to test storage devices and networks in predeployment environments
- Gives visibility into the behavior of SANs
- Eliminates the need for separate Ethernet/Fibre Channel analyzers
- Reduces project risk when upgrading, consolidating, or refreshing storage networks and data centers
- Cross topology analysis helps resolve issues resulting from applications running in both LAN and SAN

Applications

- Multi-protocol testing and analysis for 1 and 10 Gbps Ethernet; FCoE; FIP; 1, 2, 4, 8, 10, and 16G Fibre Channel; FCIP; iFCP; iSCSI; and all IP-related protocols
- Complete support for emerging FCoE draft standards

Key Features

- 2GB capture memory buffer per port
- Industry's most comprehensive topology support for LAN and SAN analysis
- Real-time dual CRC error monitoring and flagging in FCoE frames
- Patented search and filtering capabilities to accelerate troubleshooting and analysis
- Time-syncs up to 64 ports across multiple chassis
- XFP, SFP, or SFP+ configuration per blade connecting to both optical and electrical interfaces
- Multifunction blades capable of monitoring, packet capture, traffic/error generation, delay emulation, and BERT
- Full network visibility with 100 percent capture at line rate

The JDSU Xgig Analyzer for Ethernet and Fibre Channel networks is a versatile, state-of-the-art solution for monitoring, analyzing, and testing both local area and storage area network (LAN and SAN) environments. The Xgig platform consists of multiple options for chassis, blade, and software configuration so users can configure a custom solution for their specific environment and needs.

Xgig provides accelerated resolution of network impairments as well as an extensive range of capabilities to proactively prevent performance impairments before they escalate to loss of access to mission-critical applications and data. Xgig gives deep visibility to help design and test applications, monitor network performance, and ensure system reliability. The high-performance architecture of the Xgig monitors and captures 100 percent of the traffic at full line rates and triggers across all protocol layers anywhere within a frame. The industry-leading Expert engine speeds analysis without having to comb through all of the captured packets.

The JDSU Xgig Ethernet and Fibre Channel Analyzer specifically provides distributed protocol monitoring, analysis, and testing of both LAN- and SAN-based protocols. It is the ideal tool for simplifying the identification, location, and resolution of difficult network impairments on FCoE which is targeted to simplify the network structure for short distance links and has captured much attention in both the SAN and LAN industries.

Hardware Features:

- **Industry's Most Powerful Trace Capture:** Experience complete visibility into network behaviors with 100 percent capture at the full line rate of 10 Gbps backed by the largest trace buffer (4 GB per blade) available.
- **Multiple Protocols Supported on a Single Blade:** Monitor and analyze both 10GE and 10GFC protocols as well as the emerging FCoE/FIP protocol with a single blade.
- **Line Rate Traffic and Error Generation:** Transmit modified frames and/or errored traffic at up to 16 Gbps line rates.
- **Universal 10 Gbps Interface Connection:** Supports both optical and copper connections, XFP and SFP+ interfaces, and single-mode and multimode fiber.
- **Maximum Time-Sync Grouping:** Time synchronize up to 64 ports for multi-link analysis.
- Industry's highest time stamp resolution for unparalleled accuracy.

The Xgig Analyzer streamlines resolution of events that impair network performance, thus enabling users to design, implement, test, and evaluate 10 Gig Ethernet and Fibre Channel for maximum uptime and performance. The integrated suite of software for the Xgig includes: TraceControl, Performance Monitor, TraceView, and Expert.

TraceView

TraceView, as illustrated in Figure 1, is the protocol analysis software within Xgig that supports both Ethernet and the industry's most advanced SAN protocol decodes.

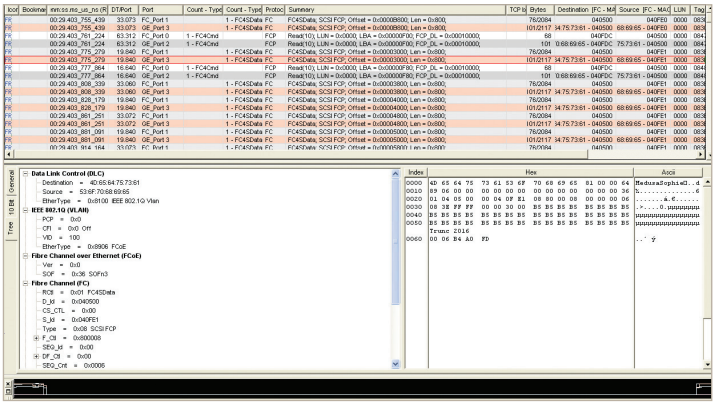

Figure 1. Xgig TraceView

TraceControl

TraceControl is the triggering and filtering software for Xgig that offers a comprehensive traffic library, as Figure 2 shows, of pre-defined and user-defined protocol templates for frames, ordered sets, and errors. This powerful tool simplifies the definition of specific conditions and sequences under which trace captures occurs. The library includes patterns for a wide range of protocols including FCoE, FIP, PFC, ETS, LLDP, DCBX, ARP, iFCP, FCIP, IP, IPv6, VLAN, iSCSI, TCP, UDP, and RDMA, among others.

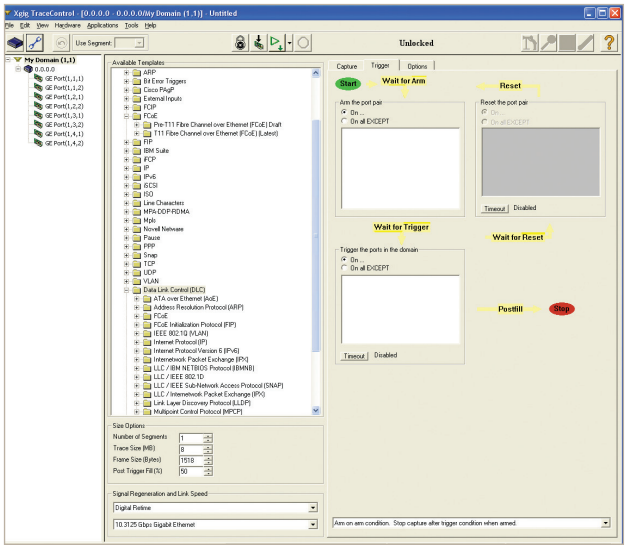

Figure 2: Xgig TraceControl

TraceControl also offers:

- internal and external cross triggering for complete trace capture flexibility across all synchronized ports.
- arm-sharing across all ports in a link to simplify test setup and configuration.
- optical Tx/Rx optical power reading to ensure signal integrity.

Expert

Expert, shown in Figure 3, provides a unique, advanced set of debugging and analysis logic, including automatic sorting through millions of events to identify performance, upper layer protocol, and logical and physical layer issues. In addition, it flags and reports 10 GbE/FC protocol violations, interoperability problems, performance issues, and errant behaviors.

The JDSU Expert Analysis supports more than 1,800 metrics and 1,200 analysis functions across protocols, including FC-2/4, FCP, SCSI, iSCSI, FCIP, iFCP, FCoE, GigE, IP, IPv6, UDP, and TCP. Expert also provides extensive network architecture and performance information for new FCoE network environments. Countless metrics help developers test and debug new networks, including FCoE, faster and more efficiently. The new report comparison feature in Expert enables users to distinctively compare the performance between native FC and FCoE networks so that developers can verify and validate the effectiveness and performance of FCoE technology.

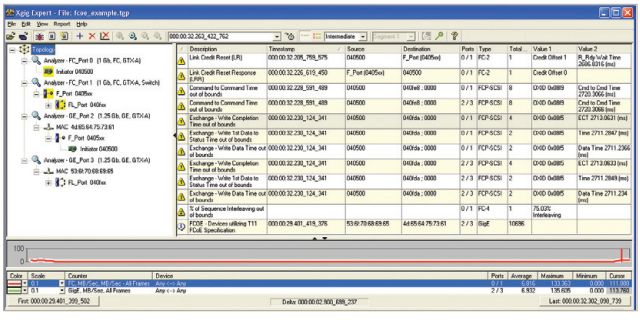

Figure 3. Expert View

Specifications

Mechanical

Dimensions (H x W x L)	XX x 156 x 292 mm (XX x 6.125 x 11.5 in)
Weight	0.5 kg (0.9 lbs)
Indicators	
Green, Yellow, Off	In Use, Link, LED x (application-specific), LED y (application-specific)
Connectors	2 XFP or 2 SFP+ connectors (optics or copper)

Accessories

10GE/FC XFP transceivers (SR and LR)
10GE/FC SFP+ transceivers (SR and LR)
10G XFP direct attach cable assemblies
10G SFP+ direct attach cable assemblies
10G CX4 copper transceivers XFP format for electrical
InfiniBand 4x3.125 GigaBaud links

Minimum System Requirements

Operating Systems: Windows 2000, Windows 2003, Windows XP, or Windows Vista
Small Configuration (sync group of up to 16 ports): Pentium III 800 MHz, 512 MB RAM min/1 GB preferred, 40 GB disk space, 100/1000 Mbps Ethernet
Large Configuration (sync group of more than 16 ports): Pentium 4 with 2 GHz or faster processor, 1 GB RAM min/2GB RAM supported, 80 GB disk space, 1000 Mbps Ethernet

Trace Buffer Size

2 to 4 Gigabytes per port

Protocol Support

Gigabit Ethernet and Fibre Channel

Software Features

Trace Control

Extensive trigger library
Multi-level triggering utilizing if/then variables
Arm/trigger from any layer of data
Trigger on either CRC in FCoE frames
Optical Tx/Rx optical power reading
Scripted automation support

TraceView

100-percent configurable spreadsheet
Powerful trace filter/search schemes
Customizable graphic decode support hundreds of decodes, including FCoE, FIP, IEEE802.1Qx, FCIP, iFCP, iSCSI, IP, UDP, TCP/IP, AoE and iWARP

PerformanceMonitor

Live traffic monitoring and statistics
Extensive views
Real-time monitoring dual CRCs in FCoE frames

Expert

Library of >1,800 metrics and error conditions
Specialized functionality for FCP-SCSI, FCIP, iFCP, FCoE, FIP, IP, IPv6, TCP, UDP, and iSCSI
Comparison reports

Appendix A: Xgig Decoding Protocol List

Fibre Channel

C-AL-2, FC-FS-2, FC-LS, FC-GS-6, FC-SW-5, FC-VI, FCP-4, FICON, VSAN, FC-AE, FC-AE-ASM, FC-AE-FCLP, FC-AE-RDMA, FC-AE-1553, FC-AE-VI, FC-SATA, FC-AV

Ethernet

FCoE/FC-BB-5/FC-BB_E, FIP, IEEE 802.1AB: LLDP, IEEE 802.1Q: GVRP, MSTP, VLAN, PFC, ETS, DCBX, DLC, ISL, LLC, SNAP, ARP, IPX, NCP, SAP, IPXRIP, NETBIOS, IBMNB, MPLS Label, PPPoE Discovery, PPPoE Session, LCP, CHAP, MPCP, IP, IPv6, Cisco PAA, PAGP, MPCP, AoE, IEEE 802.1D: BPDU, GARP, GMRP, RSTP, IEEE 802.2, IEEE 802.3, IEEE 802.3x, IEEE 802.5, IEEE SNAP, Loopback, SNAP & LACP, IEEE 802.1D, and IEEE 802.11

IP

ICMP, ICMPv6, IGMP, ESP, TCP, UDP, AH, OSPF, DVMRP, MOSPF, PIM-DM, PIM-SM, RSVP

TCP/UDP

iSCSI, FCIP, iFCP, iSNS, LDP, HTTP, SSH, NFS, RPC, RPCBIND, NBSS, Mount, DHCP, PORTMAP, MPA, DDP, RDMAP, iSER, SMB2

TCP/IP Suite

ARP, BGP (Version 4), BOOTP, CharGen, Discard, DNS, Echo, EGP, Finger, FTP, GGP, Gopher, HTTPS, ICMP, Ident, IMAP, LDAP, MIME, Mobile IP (A11), MOUNT, MPLS (v1), NetBIOS, NETCP, NIS, NNTP, NTP, OSPF, PH, POP3, RARP, RIP (Version 2), RMCP, SLP (v2), SMTP, SNMP (v1, v2, v3), TELNET, TFTP, UNIX Remote Services, VRRP, WebNFS, Whols, XDMCP, XDR, and X-Windows

SCSI

SPC-4, SPC-2, SAM-4, SSC-3, SBC-3, SMC-3, SCC-2, ADC-2, SES-2, and TCG

IPV6

DHCPng, ICMPng, IDRng, IPng, OSPFng, RIPng, and RSVPng

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