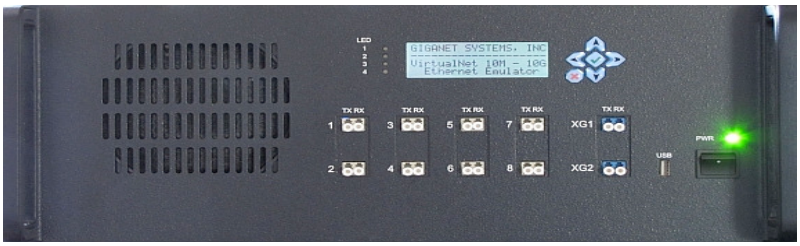
GIGANET SYSTEMS

VirtualNet™ – Ethernet/FCoE Validation



Applications

- Firmware Testing
- Network Equipment Validation and Performance Optimization
- OAM Implementation Validation
- Redundant Path/Fail-over System Testing
- Interoperability Testing
- Security Protocol Testing
- FCoE System Testing

Benefits

- Increased system robustness with complete testing of error scenarios
- Reduced time to market with faster corner case testing
- Increased productivity with automated generation of specific error scenarios
- Eliminate costly post deployment operational and performance issues
- Faster root cause analysis of problems in deployed systems through repeatable test cases

Overview

VirtualNet™ is a high-performance in-line (pass-thru) 1G/10G Ethernet test equipment that enables development and verification engineers to validate proper system response to error conditions that can occur in deployed systems. VirtualNet can modify/impair live bi-directional traffic according to user specified parameters and duration as the data passes through it.

By incorporating VirtualNet into their test and verification setup, engineers can introduce bit-errors, corrupt frame data, modify specific protocol fields in selected frames and observe the resulting system response and recovery. This testing enables validation of system performance and robustness under each specific error scenario. Thorough testing for these corner cases is essential for preventing costly post-deployment operational/performance issues for mission critical networks.

VirtualNet utilizes customized Integrated Circuits (ICs) to process the Ethernet traffic and apply specified impairments to each frame at full line rate. Impairments are applied in a highly precise and repeatable manner which is essential for reproducing issues, performance optimization and root-cause analysis.

Features

- **Performance:** Full line rate regardless of the incoming frame sizes, number of impairments, or the specified parameters for impairments.
- **Frame Impairments:** Drop, Reorder, Duplicate, Corrupt, Modify, Checksum errors, and Delay. Layer2 FCS, FCoE, and IP/UDP/TCP CRCs can be optionally corrected for modified frames.
- **Phy Layer Impairments:** Bit-Errors, Bit-rotation, Advanced LOS.
- **Targeted Impairments:** Unique ability to select a particular frame for specific impairments based on user specified frame protocol field values.
- **Protocol/Field Parsing:** Frames are parsed in hardware to recognize specific protocol fields irrespective of the protocol hierarchy.
- **Impairment durations:** Impairments can be specified as having infinite as well as finite duration in units of Time, Frames, and Bytes.
- **Impairment rates:** Impairments can be specified with distinct probabilities for each impairment to create realistic test scenarios.
- **Dynamic impairment parameters**: Impairment parameters can be changed during testing without disrupting traffic stream. VirtualNet switches from one set of conditions to another on a single frame boundary without creating unintended intermediate impairment conditions.
- **Analysis:** Detailed real-time statistics for bi-directional Ingress/Egress traffic as well as statistics related to impairments created by the VirtualNet. All statistics may be recorded to a CSV for post analysis.
- **Multiple ports:** Up to Eight 1G ports or Two 10G ports + Four 1G ports with simultaneous operation on all ports.
- **Usability:** Intuitive GUI and powerful TCL based CLI for testing automation.

Typical In-Line Test Setup

Features	VirtualNet-1G	VirtualNet-XG
Throughput	Full line rate – 2 Gbps, At all frame sizes	Full line rate – 20 Gbps, At all frame sizes
Transparent Installation	Yes	
Protocol Stack Parser	Included protocols: VLAN, MPLS, IPV4, IPV6, TCP, UDP, FCoE, Custom	
Targeted Impairments	Field comparisons =, ≠, ≥, ≤, Range, Out of Range Multiple comparisons can be combined with AND / OR conditions	
Bandwidth Control	1Kb/s to 1Gb/s, ± 0.5 Kb/s, Buffer size/Pause Frames controls	1Kb/s to 10Gb/s, ± 0.5 Kb/s, Buffer size / Pause Frames controls
Background Traffic	1Kb/s to 1Gb/s, ± 0.5 Kb/s,	1Kb/s to 10Gb/s, ± 0.5 Kb/s,
	Separate Avg/Peak Rate Controls, Priority/Round Robin Scheduler	
Frame Drop	Rate – 1E-7% (1E-9) to 100%. Distributions – Uniform, Periodic, Bursty	
Reorder	Block reorder, up to 16 KB, Reorder Delay – Frame/Time based	
Duplication	Block duplication, up to 16 KB, Duplication count – 1 to 255, Duplication Delay – Frame/Time based	
Data Corruption	Rate – 1E-2 to 1E-12 Checksum Correction Options: L2, FCoE, IPV4/6, TCP, UDP	
Data Modification	4 Engines, 32 bytes each	2 Engines, 256 bytes each
	Checksum Correction Options: L2, FCoE, IPV4/6, TCP, UDP	
CRC Errors	L2, FCoE, IPV4/6, TCP, UDP	
Delay	50us to 10Sec, ± 8 ns	8us to 10Sec, ± 6.4 ns
	Max 250ms at Full Line Rate, Fixed/Variable Distributions	
Layer 1 Bit Errors	Rate – 1E-2 to 1E-12, Burst Length – 1 to 32767 bits (Optical interfaces only)	
Output (Laser) Disable	25ms minimum, Fixed/Random Cycle Times (±200us) (Optical interfaces only)	
Real Time Statistics	L1/L2 Errors, Interface Traffic, Impairments, Logging for all stats	

Physical Specifications:

Data Interfaces: Eight 1G Ports – 850 or 1310nm Optical; 10M/100M/1G Copper (1000-BASE-T)
Two 10G Ports – 850, 1310, or 1550nm Optical
Management Interface: 1xGigabit Ethernet, GUI and TCL based CLI
Hardware Warranty: 1year included
Input Power: 100VAC to 240VAC, 50-60Hz, 225 Watts (Max)
Dimensions/Weight: 19" Rack-mountable, 4U, 7"(H) x 16 7/8"(W) x 17.7"(D), 40 lbs

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