ACCELERATED/PROGRAMMABLE

2-port, 10 Gigabit Ethernet PCI-Express Security NIC Security Sniffer Acceleration copper/fiber optic

LeWiz's iDefend family of network interface cards (NIC) designed specifically for network security applications. The cards are targeted for a wide range of security appliances for LAN/WAN and data center environments from 1 to 10Gbps networks.

LeWiz's iDefend4320™ NIC enables standard PC systems to perform network security, network packet sniffing, analysis, deep-packet inspection functions over TCP/IP networks at full 10Gbps rates with minimal CPU usage. The iDefend4320™ NIC features 2, 10Gbps ports on a short form 8-lane PCI-express card. Each port is capable of capturing network packets at full 10Gbps speed, tracks the network packets arrival times and timestamp each packet with nano-second accurate timestamp. Each port also is capable of filtering unwanted traffics based on source/destination IP addresses, TCP/UDP ports, and protocol information. To optimize total system throughput and efficiency, the iDefend4320™ card can aggregate the Ethernet ports, captured network traffic and package them for fast storage to disks.

In fact, after the card's hardware completed the packaging of network packets into formatted blocks, the system's CPU can simply store the packaged blocks into its file system for post analysis. The iDefend4320™ card offloads the performance intensive functions - only 5% of a CPU is required to capture traffic at full 10Gbps rate.

The iDefend cards also track the network statistics of each port to further assist software in network analysis and system developers in debugging their system applications. The outputs can be configured to be in the popular PCAP format, raw packet mode, or others.

LeWiz has designed this card for high performance, high throughput, fully programmable and highly flexible. Customization for customer's specific function(s) is also possible. For each port, LeWiz has packed a dedicated filter acceleration engine, a dedicated 10Gbps MAC with large, non-sharing FIFOs, and multiple DMA channels allowing simultaneous fetching of data and commands independently. Each port also has dedicated large data paths in each direction enabling the port to transfer data while processing network packets. Each port has a cluster of processing engines forming multiple processing pipelines allowing further parallel and pipelined processing of security functions – maximizing throughput. It supports standard Ethernet frame ($\leq$1500bytes) or jumbo sizes.

The iDefend4320™ card's single-chip, high level of integration allows it to maintain low cost, low power consumption, easily fitting into the budget and requirements of a short form PCI-express card. Yet, its hardware and software are fully programmable and maintains the ease of use of a normal NIC, field upgradeable - lowers the risk for deployment and ensures long-term usability for equipment investment.

The iDefend4320™ card comes with loadable device drivers for **Linux** (Fedora Core, CentOS, RedHat, SUSE) operating systems. Developed for plug-n-play, no need for the users to recompile the driver or patching the kernel.

For OEMs and developers, LeWiz created specialized APIs and other features for its iDefend4320™ NIC to enable the OEMs developing differentiated products & unique features. The iDefend4320™ NIC is a member of LeWiz's family of advanced customizable NIC products from 1Gbps to 10Gbps for the PCI-express bus. Customers using the iDefend4320™ NIC can maintain compatibility with LeWiz's other products. See LeWiz's Talon, iDefend, iGuard and iStream NIC PCI-express products at: www.LeWiz.com

Security Processing/Performance features	
2, 10Gbps ports	Non-intrusive capture
Capture network packets at full rate over each port	
Capture in promiscuous or selected based on filters	
Capture packet of any size	Jumbo size supported
Filter acceleration	Hardware accelerated search & filter on packet to packet basis
Filter bad form network packets	
Filter of bad CRC, bad checksum	
Filter based on source IP, destination IP addresses	Allows symmetric, bi-directional filtering
Filter based on source/destination UDP/TCP ports	
Filter based on protocol field	
Timestamp each captured packet with high resolution timer (nano-second accurate, GPS timing option)	Important for financial and legal applications
Aggregate the captured traffic over multiple ports	Reduce processing overhead Multiply the network performance Monitor multiple nets or subnets with a single card/system
Load balance the captured traffic over multi-CPUs for processing	
Supports customization of customer specified security functions	Most flexible for user applications. Both hardware and software are customizable
Support fast path software	Lower latency, higher overall system performance
Full 64-bit addressing	
Output formats	PCAP, RAW, Timestamp + Size, and others

Flexibility/Reliability features	
Fully programmable	Allow tuning out in the field, shielded from unknown field equipment or field conditions.
Remote upgradeable	Lower support cost. Allow future value-added features to be added for your customers

Detailed Specifications:

Product part number	
iDefend4320-CX4	2x10Gbps CX4 copper Ethernet
iDefend4320-SR	2x10Gbps SR fiber optic
iDefend4320-LR	2x10Gbps LR fiber optic
System interface	
Compliant PCI-Expess Base Specification 1.1	
8 lanes PCI-express (PCI-E)	8 lane PCI-E physical but also works in with x8 or x16 connectors
Supports PCI-E advanced error logging	
Supports ECRC checking and generation	Enhance data integrity, system reliability
Data loading from serial EEPROM	Useful for OEMs requiring customized configurable product information
Each MAC has its own register set	Host system can control and examine status each MAC independently
Software support	
Loadable driver for Linux	No need to recompile the driver or the OS
None interference with existing applications	Existing software applications would run as is without modification or recompiling.
Redhat Linux ES	64 and 32 bit version
Novell SuSE LES 10	64 and 32 bit version
Fedora Core CentOS	64 and 32 bit version
A variety of kernel/OS are supported	

External network interfaces	
2, 10Gbps Ethernet ports per board	
CX4 copper or SR/LR Fiber optic	
Standard CX4 copper cable 10GBase-SR fiber optic 10GBase-LR fiber optic	15m CX4 copper 300m, 850nm multi-mode 10Km, 1310nm single mode
Networking features	
Port bonding or aggregation	Boost performance & single stream of network packets for orderly timestamping.
Physical board size	
Length x Width	6.6 x 2.535 inches (CX4 copper) 6.6 x 3.7 inches (SR/LR optic)
Operating spec	
Uses standard voltages from PCI-express connector	12V, 3.3V
Operating temperature	$0 - 55\,^{\mathrm{O}}\mathrm{C}$
Operating humidity	85% at $+55\,^{\mathrm{O}}\mathrm{C}$
Recommended system requirements	
(The following is the minimum recommended system requirement. The board can work in many different environments including the configuration specified below. This is not a required environment for the board to function.)	
x86 or other CPUs with 1GHz speed, 32-bit or better	For example: Xeon, Opteron, XScale, PowerPC, MIPS, or others
1GByte of system memory	x8 PCI-express slot or better