DATASHEET **iStream5220™**

ACCELERATED/PROGRAMMABLE

2-port, 10 Gigabit Ethernet
PCI-Express NIC
Video streaming acceleration
IPv4 and IPv6
Copper/Fiber Optic

LeWiz is the first company to produce a family of network interface cards (NIC) designed specifically for video over IP applications. The cards are targeted for a wide range of video applications on the Internet, cable TV networks, and enterprise or high speed embedded video applications.

LeWiz's iStream5220™ NIC enables standard servers to stream video over TCP/IP networks at full 10Gbps rates with minimal CPU intervention. LeWiz Customers have reported performance at 10Gbps line rate using only 4% processing speed of a single CPU in the server system whether over 1 or 10,000 simultaneous streams. The iStream5220™ NIC features 2, 10Gbps ports on a small low-profile (copper) or short-form (fiber) x8 PCI-express card. The card is ideal for high speed, usage intensive video server applications where streaming of large data files to thousands of clients simultaneously is required.

LeWiz has designed this card for high performance and throughput. For each port, LeWiz has packed a dedicated streaming 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 video data in parallel, non-blocking. Each port has a cluster of processing engines forming multiple processing pipelines allowing further parallel and pipelined execution while streaming out. Designed for video applications, the board has a host of acceleration features for UDP transmission including full UDP/TCP checksum offload, and UDP/TCP auto-segmentation capabilities.

The iStream5220 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 PCI-express low-profile or short-form card. Yet, its hardware and software are fully programmable and maintains the ease of use of a normal NIC that many engineers are familiar with. There are many built-in programmable functions allowing the card to be tuned even out in the field to be compatible with any peculiar network equipment the user may be encountered out in the field.

The iStream5220 card comes with loadable device drivers for Linux and Windows operating systems. Developed for plug-n-play, no need for the users to recompile the driver or patching the kernel as typically required by other offload cards.

For OEMs and developers, LeWiz created specialized APIs and other features for its iStream5220™ NIC to enable the OEMs developing differentiated products & unique features. The iStream5220™ NIC is a member of LeWiz's family of advanced NIC products from 1Gbps to 10Gbps for the PCI-express bus. Customers using the iStream5220™ NIC can maintain compatibility with LeWiz's other products. See LeWiz's Talon and iStream NIC PCI-express products at: www.LeWiz.com

iStream5220™ DATASHEET

Video Streaming features	
2, 10Gbps ports	Can be Active/Active or Active/Passive ports
Stream with UDP or TCP protocol over IP	
Support over 10,000 simultaneous clients	
Dynamic rate controllable per stream	Wide range of rate from Mbps to Kbps per stream. Allowing service providers to control streaming rate of video data vs. other data types
Ensure QoS for each receiving client	
Support MPEG or RTP video streaming	
Tracks timestamp of each video stream	
Tracks video sync of each video stream	
Build and stream out complete video packets	Using streaming engine, independent of the CPU
Minimize memory usage even at very large number of concurrent users	
Supports variable video length	
Dynamic variable buffer data length	Allows video streaming as soon as data is available
Support scattered video data	Video data can be spread out over any where in the 64-bit address space. Flexible for applications.
Contains programmable networking features	Allows field tuning, fitting with any unknown field equipment
Supports customization of video functions	Most flexible for user applications

Performance features	
Dedicated streaming engine per port	Performance without CPU utilization
Dedicated 10GigE MAC per port	High speed streaming
Support auto-segmentation of video packets	
Support auto-checksum UDP/TCP or IP	
Supports IPv4 or IPv6	Expandability, future proof
Dedicated DMA engines per port	Maximize bus bandwidth. Parallel execution
Manage multiple large video blocks per stream without CPU	Allowing a stream to feed video for a long time before needing more services
Multi-ring architecture	Parallel processing of control information with data information. Make efficient use of multi-CPU environment.
Supports multi-CPU cores, multi-threaded, highly parallelized systems	
Full 64-bit addressing	

iStream5220™ DATASHEET

Detailed Specifications:

Product part number	
iStream5220-CX4 iStream5220-SR iStream5220-LR	2x10Gbps, CX4 copper 2x10Gbps, SR fiber 2x10Gbps, LR fiber
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 AS 4.0, 4.3 Redhat Linux ES 4	Full offload acceleration, both 64 and 32 bit version
Novell SuSE LES 10, 9.0	Full offload acceleration, both 64 and 32 bit version
Fedora Core 5, 4	Full offload acceleration, both 64 and 32 bit version
CentOS	
IPv4 and IPv6	Fully compatible with IPv4 and IPv6

External network interfaces	
Dual 10Gbps Ethernet ports per board	Great for streaming servers, data mirroring, or multi-zone networking using only 1 board and 1 system PCI-E slot
CX4 copper or SR/LR fiber optic	
Standard CX4 copper 10GBase-SR fiber optic 10GBase-LR fiber optic	15m, CX4 copper cable 300m, 850nm multi-mode 10Km, 1310nm single-mode
Networking features	
Port fail-over capability	Network redundancy to enhance network system reliability – continue network operating even during network down time.
Others	
Expansion FLASH, 512KByte per Ethernet port (optional)	Can act as a remote boot ROM or special purpose function code/data storage.
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^{O}C
Operating humidity	85% at +55 ^{O}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

LeWiz Communications, Inc.
1376 N. 4th Street, Suite 300
San Jose, CA 95112 USA
Phone: 408-452-9800 ext 109
Fax: 408-452-9805
info@LeWiz.com
www.LeWiz.com