



ACCELERATED/PROGRAMMABLE



2-port, 10 Gigabit Ethernet
PCI-Express NIC
TCP/UDP/IP acceleration
IPv4 and IPv6
copper/fiber optic

LeWiz's Talon4220™ NIC is the next generation of LeWiz's successful Talon3220™ card – the world's first dual 10G PCIe NIC. As a next generation product, LeWiz filled the Talon4220™ card with offload features based on feedback from customers in the servers, storage and networking areas. The Talon4220™ NIC is fully programmable, capable of remote and field upgradeable. In addition to its TCP/UDP/IP offload functions, OEM customers using the Talon4220™ card can create customized versions to provide their product-differentiation features.

The Talon4220™ card is designed for performance. It packs into a single chip 2 separate 10G MACs, 2 dedicated 10G TCP/IP offload engines, dedicated data paths, FIFO's and buffers for transmit and receive on a per port basis. Each port is fully capable of transmit and receive independently. Both ports can work simultaneously and are capable of active/active configuration. The Talon4220™ card maximizes the system's capability to its peak – optimizes your IT dollars. Should you need higher than 10Gbps rate, the 2 ports can be aggregated together and acts as a single much higher-speed port.

The Talon4220™ 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 card. Yet, it still maintains the ease of use, loadable device drivers of a normal NIC that many engineers are familiar with. The card contains many built-in programmable functions allowing it 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

A unique feature of the Talon4220™ is its ability to move data directly into application buffers directly. This means faster data rate, lower latency, and low CPU consumption for the system. It can perform this complicated task over many concurrent TCP/IP sessions with controllability on a per session basis - much more flexible for software to tune the system to the application requirements. At the same time, it enables software to maintain the easy-to-use TCP/IP socket interface. Storage systems would benefit a great deal with this feature.

The Talon4220™ optimizes multi-CPU systems efficiently. It's capable of directing the received data to individual CPU core for processing. In today's servers, dual and quad-core CPUs are widely available. The processors built into the Talon4220™ card co-operates with the multi-core of the systems to enable the best use of available computing resources. To the users, this means the server is able to serve more clients per system purchased. In virtual systems which require multiple OS's running concurrently, its multi-queue feature allows data to be directed to the memory queue which is most suitable for the specific application or OS.

The Talon4220™ card also offers a host of offload functions for high speed transfers (see the detailed description). It allows full 64-bit addressing range; comes with loadable device drivers for Linux and Windows OS's. 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. Customers using the Talon4220™ NIC can maintain compatibility with LeWiz's family of 1G to 10G products. See LeWiz's Talon and iStream NIC products at: www.LeWiz.com

LeWiz also offers application for moving large amount of data or files at high speed using this product. Contact LeWiz for details.

Performance features	
9.2 to 9.5Gbps per direction per port	At 1300 Byte frame, only 5% CPU consumption for TX direction
>18Gbps per port, simultaneous bi-direction	
Dedicated acceleration engine per port	Performance without CPU utilization
Dedicated 10GigE MAC per port	High speed, 10Gbps line rate
Auto-segmentation of variable size packets	
Auto-reassembly of incoming packets	
Auto-checksum UDP/TCP or IP	
Jumbo frame support	Up to 16KB per frame
Direct data placement for application buffers	Perfect for systems which transfer and manage large data size Controllable on a per TCP connection basis Utilize friendly TCP socket API
Supports IPv4 or IPv6	Expandability, future proof
Dedicated DMA engines per port	Maximize bus bandwidth. Parallel execution
Multi-ring architecture	Highly parallelized processing. Make efficient use of multi-CPU environment. Great for virtualization systems
Supports multi-CPU cores, multi-threaded, highly parallelized systems	Make efficient use of system resources
Receive side scaling (RSS)	Scale up with number of CPUs Supports both TCP & UDP Windows TOEPLITZ harsh or application specific
Full 64-bit addressing	Buffers can be any where in the 64-bit address space
Supports scatter-gather data	Allow flexibility for software to place pieces of buffers any where without copying them.
Supports out of order data access	

Detailed Specifications:

Product part number	
Talon4220-CX4	2x10 GigE, CX4 copper;
Talon4220-SR	2x10 GigE, 10GBase-SR fiber;
Talon4220-LR	2x10 GigE, 10GBase-LR fiber
System interface	
Compliant PCI-Express 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
Each MAC has its own register set	Host system can control and examine status each MAC independently
Software support	
Windows OS driver	Windows Server 2003, 64 or 32 bit
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	Full offload acceleration, both 64 and 32 bit version
Redhat Linux ES 4	
Novell SuSE LES 10, 9.0	Full offload acceleration, both 64 and 32 bit version
Fedora Core 7, 5, 4	
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 cable	15m CX4 copper
10GBase-SR fiber optic	300m, 850nm multi-mode
10GBase-LR fiber optic	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 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 rails
Operating temperature	0 – 55°C
Operating humidity	85% at +55 °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

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