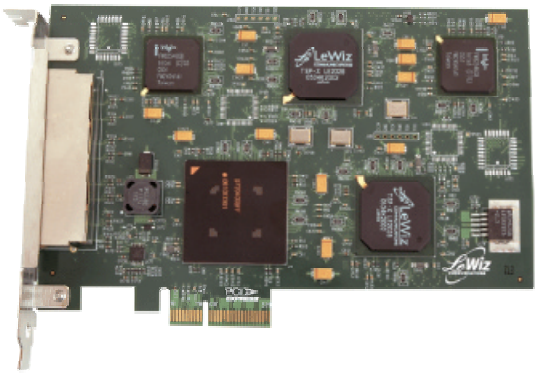
DATASHEET

TALON3408™



4-port, Gigabit Ethernet PCI-Express NIC with full TCP/IP acceleration

LeWiz's Talon3408™ network interface card (NIC) is designed for performance. It enables the system to transfer at full network wire-rate 4Gbps in each direction while significantly reducing the burden of network processing and data movement from the host CPU. It's ideal for the server and storage applications where the high port count, large data size, and high number of clients are needed but still maintain a low system cost and power consumption.

The Talon3408™ TCP/IP accelerated NIC offers 4, 1Gbps Ethernet ports with full TCP/IP offload engine (TOE) on a single high-performance, 4-lane PCI-Express (PCI-E) bus slot. Taking advantage of LeWiz's advanced TCP/IP offload engine (TOE) architecture, the Talon3408 TOE NIC maintains the system performance even in the most severe loading environment of high data rate or large concurrent client counts. In severely loaded applications, the non-TOE NIC would hog the system resources and hampers the system's response time. A simple test of 4 clients running at full rate would bring such server with 2 dual-core CPUs down to its knees. In contrast, the Talon3408 TOE NIC performs very well in such environment. It frees up the system resources and avoid over burden the CPUs thus maintains the system response time. From the user's view, the user would not experience server slowdown even during the most severe time.

LeWiz's Talon3408™ TOE NIC is ideal for applications such as iSCSI, NAS storage, video serving, and proxy systems. Its 4-ports can be used to connect to multiple networks, performs mirroring functions, fail-over protection or bonded together to enable high-speed large pipe transfer. Unlike the dedicated NIC, LeWiz's TOE NIC can support a unified traffic environment where iSCSI, RDMA, HTTP, UDP/TCP traffic and other traffic types can co-exist on the same network link. This further reduces the system and network cost for the users.

The Talon3408™ TOE NIC has many performance features. It contains a x4 PCI-express host interface to enable fast data transfer data to/from the host. On-board, the LeWiz NIC has multiple, dedicated buses and dedicated TOE chips for the 4 ports to enable simultaneous data transfer and TCP/IP processing per direction without sharing. On-board dedicated Ethernet MAC on a per port basis, large on-chip FIFOs, and multiple DMA channels allow fetching/storing of descriptors, payload and other data structures independently. The board has full checksum offload, full TCP/IP offload capability. It offloads the data path problems from the host CPUs as well as TCP/IP connection setup and teardown. For intensive environment, these features keep the system humming in severe time, and free up system resources for advanced protocols such as iSCSI.

The Talon3408 TOE NIC is well tested with various application software, system platforms and OS mixes. Best of all, LeWiz's device drivers are loadable, do not require recompilation or patching of kernels, thus very user friendly and easy to use.

For OEMs and developers, LeWiz created specialized APIs and other features for its TOE NIC to enable the OEMs to develop differentiated products. The Talon3408™ TOE NIC is a member of LeWiz's family of advanced NIC products from 1Gbps to 10Gbps for the PCI-express bus. Customers using the Talon3408™ TOE NIC can upgrade to higher port count or higher speed easily. See LeWiz's Talon NIC PCI-express products at www.LeWiz.com.

General performance features	
Each Ethernet port has a dedicated MAC with its own register set, memory buffers, DMA engines	Optimizes for high performance with independent transmit and receive simultaneously on a per port basis.
TCP/UDP/IP checksum offload	Free the CPU from performing checksum functions on a packet to packet basis
Statistic collection for management and RMON on a per Ethernet port basis	Useful for diagnostic and performance optimization of the network
Independent DMA engines for transmit and receive	Mitigating instantaneous receive bandwidth and eliminating transmit underruns.
Dedicated DMA engines for fetching transmit and receive descriptors	Maximizes the host bus bandwidth
4x64KByte configurable transmit and receive data FIFOs on board	Large on-board stores - maximizes the network efficiency
Caches up to 64 descriptors per fetch	Maximizes bus bandwidth
Interrupt coalescing and throttling	Optimizes system CPU usage. Minimizes CPU thrashing
Dedicated on-board buses	Minimizes arbitration overhead; maximizes high speed data transfer

Full TCP/IP offload features	
TCP session set up and tear down	Handles SYN, FIN three way handshakes and complete session setup, tear down without CPU intervention
TCP segmentation	Automatically segments large data block into the smaller block size required by the network
TCP reassembly	Re-assembles segmented packets into ordered, non-redundant information without CPU intervention
256,000 concurrent sessions	High number of TCP sessions suitable for even very large client base applications
Data re-transmission	Resends failed packets automatically without CPU intervention
Data re-ordering	Re-orders data packets received out of order & eliminates redundant data without CPU intervention
TCP Timer handling and management	Manages 7 TCP timers per TCP session without CPU intervention
TCP Option handling	Handling TCP protocol's TCP options such as TCP window scaling, updating without CPU intervention.
TCP buffer management	Work with the OS to manage TCP buffer allocation and freeing.

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Detailed Specifications:

Product part number	
Talon3408	4-port Gigabit Ethernet, copper, x4 PCI-express bus
System interface	
Compliant PCI-Expess Base Specification 1.1	
4 lanes PCI-express (PCI-E)	4 lane PCI-E physical but also works in x1 and x4 logical buses with x8 or x16 connectors
Each lane capable of 2.5Gbps, full duplex	High speed – up to 20Gbps for 4 lanes PCI-E system bus
Supports 1 Virtual Channel	
Supports 256 byte max payload size	Large data block transfer optimizes bus efficiency
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 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 9.0, SuSE Professional 9.3	Full offload acceleration, both 64 and 32 bit version
Fedora Core 4 , 3	Full offload acceleration, both 64 and 32 bit version
IPv4 and IPv6	Fully compatible with IPv4 and IPv6

External network interfaces	
Quad 1Gbps Ethernet ports per board	Great for storage back-up, data mirroring, or multi-zone networking using only 1 board and 1 system PCI-E slot
100 meter Cat-5 UTP copper	
Standard RJ45 copper connection (1 for each port, 1000Base-T, 100Base-TX, 10Base-T compliant)	Low cost NIC, standard copper cable and external switching equipments.
Networking features	
Port fail-over capability	Network redundancy to enhance network system reliability – continue network operating even during network down time.
Port bonding (or port teaming)	Up to 16 times the port throughput rate.
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 4.2 inches
Operating spec	
Uses standard voltages from PCI-express connector	
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	x4 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