Product Specification

NIC-10G-2BF

A-GEAR 10Gigabit Ethernet Server Adapter X520 2xSFP+

Apply Dual-port 10 Gigabit Fiber SFP+ server connections, These Server Adapters Provide Ultimate Flexibility and Scalability in Virtual and Unified Storage Environments

1. Features

- Build on PCI Express * 2.0 Technology and Intel original 10 gigabit controller technology deliver the performance that demanding applications require.
- 2 high-performance 10 gigabit SFP+ transceivers connections for slot-constrained servers which be optional and replaceable.
- Optimized for virtualized environments
- Energy-efficient design with integrated
- High-volume stable architecture with broad
- Industry-leading product innovations for I/O visualization
- Unified networking support simplifies the network infrastructure
- Deploy multiple network and deploy the ideal solution of critical Web applications and the environment in high-performance servers.

2. Product Description

2.1. Reliable connectivity you can count on

10 Gigabit Ethernet PCI Express Server Adapter is designed for server and high-end equipment, deploy multiple network and deploy the ideal solution of critical Web applications and the environment in high performance servers. This server adapter can easily integrate any PCI Express X8 into 10 Gigabit network. And optimized for performance, the system's I/O is no longer the bottleneck of high-end network

applications. This server adapter is based on Intel 82599ES Ethernet controller, with two fully integrated Gigabit Ethernet Media Access Control (MAC) and XAUI ports. In addition to managing Ethernet MAC and PHY layer functions, this controller manage PCI-E packet traffic through its transaction, link, physical and logical layer. The controller can share tasks for the host through hardware acceleration, such as TCP / UDP / IP checksum calculation and TCP segmentation.
This new Ethernet X520 Server Adapters are the most flexible and scalable Ethernet adapters for today's demanding data center environments. Data center networks are being pushed to their limits. The escalating deployments of servers with multi-core processors and demanding applications such as High Performance Computing (HPC), database clusters, and video-on-demand are driving the need for 10 Gigabit connections. Customers require flexible and scalable I/O solutions to meet the rigorous requirements of running mission-critical applications in virtualized and unified storage environments. Powered by the third-generation 10 GbE network controller, the Intel Ethernet 82599ES 10 Gigabit Ethernet Controller, the X520 server adapter family addresses the demanding needs of the next-generation data center by providing unmatched features for virtualization, flexibility for LAN and SAN networking, and proven, reliable performance.

2.2. Best Choice for Virtualization

The explosive growth in virtualization is leading to an increasing demand for network performance. With more Virtual Machines (VMs) running on each multi-core server, networking traffic is dramatically increased with each VM competing for available I/O bandwidth. Intel's new family of Intel Ethernet X520 Server Adapters addresses networking bottlenecks in virtualized environments. These new adapters enable network-intensive applications to achieve the performance expected in a virtualized environment. The Ethernet X520 family of server adapters provides the best networking performance available in the industry, whether the physical port is configured in an emulation mode using the virtual switch in the Virtual Machine Monitor (VMM), or is directly assigned to a virtual machine. In the emulation mode, Intel's I/O technology, Virtual Machine Device queues 1 (VMDq) optimizes network performance by offloading data sorting and copying from the software Virtual Switch in the VMM to the Intel Ethernet 82599ES 10 Gigabit Controller. This configuration is best suited for a large number of VMs running standard applications that have limited bandwidth and latency requirements.
The Ethernet X520 family of server adapters delivers the same functionality and throughput as ten dual-port, one Gigabit adapters, saving cost, power, and complexity.

2.3. Unified Networking and Storage

The family of Intel Ethernet X520 server adapters lowers your data center total cost of ownership (TCO) by providing the ability to route LAN and SAN traffic over a single fabric.
Support for Fiber Channel over Ethernet (FCoE) – FCoE encapsulates Fiber Channel frames over standard Ethernet networks, enabling Fiber Channel to take advantage of 10 GbE networks while preserving its native protocol. The X520 server adapters offer FCoE hardware acceleration to provide performance comparable to FC HBAs. The new server

adapters support Data Center Bridging, also known as Converged Enhanced Ethernet (CEE), which allows customers to configure traffic classes and priorities to deliver a lossless Ethernet fabric. An Intel Ethernet X520 server adapter reduces TCO by eliminating redundant fabrics and saves the cost of expensive FC HBAs and FC switch ports.
Support for iSCSI – The server adapters provide complete support for proven native OS and VMM iSCSI initiators as well as iSCSI boot. now with the CRC instruction set included in the latest Intel Xeon processors, CRC validation is possible with minimal impact to network throughput while delivering superior data integrity.
The new Ethernet family of X520 server adapters do it all: 10 Gigabit LAN, FCoE, and iSCSI; truly delivering on the promise of unified networking.

2.4. Reliable Performance

The family of X520 server adapters include a number of advanced features that allow it to provide industry-leading performance and reliability.
Security Optimizations – The adapters support IPsec offload for Microsoft's Network Access Protection (NAP), Active Directory,* and future security capabilities in Windows* 7. An X520 server adapter allows customers to run a secure network environment without sacrificing performance.
PCIe v2.0 (5 GT/s) – PCIe v2.0 (5 GT/s) support enables customers to take full advantage of 10 GbE by providing a maximum of 20 Gbps bi-directional throughput per port on a single dual port card. 10 Gigabit Ethernet controller along with Intel Xeon 5500 series processor servers deliver the performance that demanding applications require.
Designed For Multi-core Processors – Support for technologies such as Intel QuickData, multiple MSI-X vectors, and Low Latency Interrupts allow the X520 server adapters to provide high-performance, 10 Gigabit connectivity in multi-core server blades. These technologies distribute network processing across multiple CPU cores, improving overall performance. For today's demanding virtualized data center environments, the new family of X520 server adapters deliver ultimate flexibility and scalability.

3. Product Specifications

3.1. General and Technical Features

Manufacturer Product Name	A-GEAR 10 Gigabit Ethernet Dual Port Server Adapter X520 2xSFP+
Product Code	NIC-10G-2BF
Form Factor	Internal-connected with Intel Xeon 5500 series processor servers
Controller-Processor	Intel 82599ES*1
Bus Type	PCI Express 2.0 (5GT/s)
Bus Width	x8 lane PCI Express, operable in x8 and x16 slots

Bus Speed (x8, encoded rate)	20 Gbps uni-directional; 40 Gbps bi-directional	
Network Interface Type	SFP+ Slots *2, two LC fiber-optic connectors Direct Attach cables	
Data Rate(s) Supported	Optical: 1 GbE/10 GbE Direct Attach: 10 GbE per port	
Network Standards Physical Layer Interface	10GBASE-LR 10GBASE-SR	
IEEE Network Standards	IEEE 802.3	
Hardware Certifications	FCC B, UL, CE, VCI, BSMI, CTICK, MIC	
LEDs	2 (1/port) Link (solid) and Activity (blinking) Link Speed (green = 10G / yellow = 1G)	
Brackets *2	Includes a full-height bracket and a low profile bracket.	
Air Flow	Minimum of 100 LFM required	
Typical power consumption	Maximum 10.7 W	Typical 10.0 W

3.2. Environment Standard

Operating Temperature	0°C ~ 55°C
Operating Humidity	90%
Stoke Temperature	-40°C ~ 70°C
Stoke Humidity	90%

3.3. Physical Dimensions

Length	14.8 cm (5.83 in)
Width	6.8 cm (2.68 in)
Height of Brackets	12.0 cm/8 cm (4.72 in/3.15 in)
Packing Standard Size (Unit)	20 x 15 x 4.5 (cm) (7.87 x 5.91 x 1.77 (in))

4. Features and Benefits

Features	Benefits
Intel 82599 10 Gigabit Ethernet Controller	Industry-leading, energy-efficient design for next-generation 10 Gigabit performance and multi-core processors
Low-profile	Enables higher bandwidth and throughput from standard and low-profile PCIe slots and servers

Features	Benefits
Load balancing on multiple CPUs	Increases performance on multi-processor systems by efficiently balancing network loads across CPU cores when used with Receive-Side Scaling (RSS) from Microsoft or Scalable I/O on Linux*
iSCSI remote boot support	Provides centralized storage area network (SAN) management at a lower cost than other iSCSI solutions
Support for most network operating systems (NOS)	Enables widespread deployment
RoHS-compliant	Complies with the European Union directive 2002/95/EC to reduce the use of hazardous materials
Intel PROSet Utility for Windows* Device Manager	Provides point-and-click management of individual adapters, advanced adapter features, connection teaming, and virtual local area network (VLAN) configuration
Time Sync (IEEE 1588, 802.1as)	Lets networked Ethernet equipment synchronize internal clocks according to a network master clock; endpoint can then acquire an accurate estimate of the master time by compensating for link latency
Plug and play support	Standard
Receive Side Scaling	Multiple Rx queues enable the efficient distribution of network receive processing across multiple CPUs in multiprocessor systems
Direct Cache Access (DCA)	The I/O device activates a pre-fetch engine in the CPU that loads the data into the CPU cache ahead of time, before use, eliminating cache misses and reducing CPU load
Product backing	Backed by A-GEAR limited lifetime warranty, 3-months replacement guarantee, and 3-years global services warranty, and worldwide support.

5. Advanced Software Features

Adapter fault tolerance (AFT)	Adaptive load balancing (ALB)
Switch fault tolerance (SFT)	Teaming support
Test switch configuration	PCIe Hot Plug*/Active
IEEE 802.1Q* VLANs	IEEE 802.3ad (link aggregation control protocol)
IEEE 802.3 2005* flow control support	IEEE 1588 Precision Time Control Protocol
IEEE 802.1p*	Interrupt moderation

TCP segmentation/large send offload	MSI-X supports Multiple Independent Queues
Tx/Rx IP, TCP, and UDP checksum offloading (IPv4, IPv6) capabilities	IPv6 offloading--Checksum and segmentation capability extended to new standard packet type

6. Network Operating Systems (NOS) Software Support

Operating System	IA32	x64	IPF
Windows Vista* SP2	—	—	N/A
Windows Server* 2003 SP2	—	—	—
Windows Server 2008 SP2	—	—	—
Windows Server 2008 SP2 Core	—	—	N/A
Linux* Stable Kernel version 2.6	—	—	—
Linux RHEL 4.7,	—	—	N/A
Linux RHEL 5.3	—	—	—
Linux SLES 10 SP2	—	—	—
Linux SLES 11	—	—	—
FreeBSD* 7.0	—	—	—
EFI* 1.1	—	N/A	—
UEFI* 2.1	—	—	—

7. I/O Features for Multi-Core Processor Servers

QuickData Technology	DMA Engine: enhances data acceleration across the platform (network, chipset, processor), thereby lowering CPU usage Direct Cache Access: enables the adapter to pre-fetch the data from memory, thereby avoiding cache misses and improving application response time
MSI-X support	Minimizes the overhead of interrupts Allows load balancing of interrupt handling between multiple cores/CPUs
Low Latency Interrupts	Based on the sensitivity of the incoming data it can bypass the automatic moderation of time intervals between the interrupts
Header splits and replication in receive	Helps the driver to focus on the relevant part of the packet without the need to parse it

Multiple queues: 8 queues per port	Network packet handling without waiting or buffer overflow providing efficient packet prioritization
Tx/Rx IP, SCTP, TCP, and UDP checksum offloading (IPv4, IPv6) capabilities	**Lower processor usage , Checksum and segmentation capability extended to new standard packet type**
Tx TCP segmentation offload (IPv4, IPv6)	Increased throughput and lower processor usage Compatible with large send offload feature
Receive and Transmit Side Scaling for Windows* and Scalable I/O for Linux*	This technology enables the direction of the interrupts to the processor cores in order to improve the CPU utilization rate
IPsec Offload	Offloads IPsec capability onto the adapter instead of the software to significantly improve I/O throughput and CPU utilization (for Windows* 2008 Server and Vista*)
LinkSec	A Layer 2 data protection solution that provides encryption and authentication ability between two individual devices (routers, switches, etc.) These adapters are prepared to provide LinkSec functionality when the ecosystem supports this new technology

8. Visualization Features

Virtual Machine Device queues 2 (VMDq)	Offloads the data sorting functionality from the Hypervisor to the network silicon, thereby improving data throughput and CPU usage Provides QoS feature on the Tx data by providing round robin servicing and preventing head-of-line blocking Sorting based on MAC addresses and VLAN tags
Next-generation VMDq	Enhanced QoS feature by providing weighted round robin servicing for the Tx data Provides loopback functionality, where data transfer between the virtual machines within the same physical server need not go out to the wire and come back in. This improves throughput and CPU usage. Supports replication of multicast and broadcast data
IPv6 offloading	Checksum and segmentation capability extended to the new standard packet type

Advanced packet filtering	24 exact-matched packets (unicast or multicast) 4096-bit hash filter for unicast and multicast frames Lower processor usage Promiscuous (unicast and multicast) transfer mode support Optional filtering of invalid frames
VLAN support with VLAN taginsertion	Ability to create multiple VLAN segments Stripping Packet filtering for up to 4096 VLAN tags

9. Companion Products

A-GEAR Ethernet server adapter has been tested for compatibility, available from 10/100 Mbps to 1000Mbps and 10 Gbps, optical fiber or copper, gigabit SFP transceivers SM or MM, 10 gigabit Ethernet SFP+ transceivers, can be adaptive plug replacement, extensive using PCI Express * and single to dual to quad ports configurations.

10. Customer Support

A-GEAR Customer Support Services offers a broad selection of programs including phone support, online service and warranty service. We offer you good service including 3-months replacement guarantee, and 3 years global warranty services and worldwide support.