

# NetEffect NE020ASC

## 1Gb/10Gb Accelerated Ethernet ASIC

The industry's leading multi-gigabit accelerated Ethernet ASIC solution, the NetEffect® NE020ASC enables development of exceptionally power-efficient adapters for high-density server, blade and storage solutions. It is a performance-optimized building block for best-in-class solutions for data networking, scale-out (clustering) networking, and storage networks. This high-performance, low-latency ASIC enables adapter and controller implementations allowing businesses to perform more work in less time, providing immediate performance benefits to all applications. Its unique, patented architecture implements TCP offload and RDMA capabilities for accelerated performance and achieves the lowest power consumption of any 10GbE ASIC available.

### Lower power and cooling requirements enable higher compute densities

The NE020ASC ASIC requires less than four Watts, half of the power required by other 10Gb adapters. Extremely important in power and cooling-constrained, high-density blade, rack and storage environments, NE020ASC-based solutions allow IT managers to achieve greater processing power per square foot in the data center.

### Sustained, predictable performance under load

For scale-out, clustering, high-performance data networking or storage networking, NE020ASC provides sustained high-performance – 18-Gbps bi-directional bandwidth and latency under six  $\mu$ sec – facilitating shorter application processing times and faster response times. This is achieved through a unique, Virtual Pipeline Architecture that implements the full IETF iWARP extensions to Ethernet. As a result, solutions built on the NE020ASC achieve

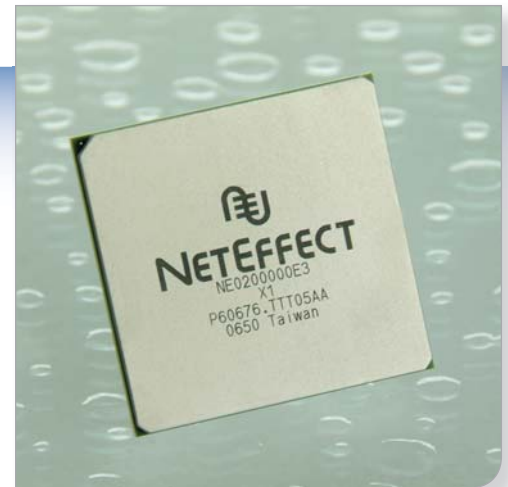
sustained, predictable performance in multiple-connection environments such as multi-core processors, high-performance computing and virtualized server implementations.

### Highly integrated small package size enables LOM implementations

The NE020ASC's Virtual Pipeline Architecture uses a hybrid state machine design to provide a superior performing product in a small chip package. The ASIC design minimizes memory requirements for caching. Designed for use with external memory, it allows a wide range of flexible implementations, from LOM to storage controller.

### Standard media interfaces

The NE020ASC provides support for single and dual network 10GbE MAC configurations, as well as dual and quad 1GbE MAC configurations. Native support for CX4 and KX4 media interfaces is also provided.



### Highlights

- > Performance optimized for latency-sensitive scale-out (clustering) applications
- > Latency less than six  $\mu$ sec, sustained performance under heavy multi-connection loads
- > Exceptional bandwidth: over 18 Gbps (bi-directional, 10GbE), over 1.8 Gbps (bi-directional, 1GbE)
- > Protocol offload achieves 95% CPU availability for applications
- > Industry's lowest power consumption ideal for applications in high-density server, blade and storage solutions
- > Supports simultaneous connectivity to all data center networks: scale-out (clustering), data networks and storage networks
- > Supports simultaneous traffic through NIC, TOE and RDMA
- > Virtual Pipeline Architecture implements all IETF-approved iWARP extensions

## Specifications

### 10GbE performance

- > Latency: less than 6 µsec
- > Bandwidth: 18 Gbps bi-directional
- > CPU utilization: less than 5%

### 1GbE performance

- > Latency: less than 8 µsec
- > Bandwidth: 1.8 Gbps bi-directional
- > CPU utilization: less than 5%

### Ethernet interface

- > 1Gb or 10Gb Ethernet interface
- > 1GbE: full bandwidth dual and quad MACs available
- > 10GbE: full bandwidth single and dual MACs available
- > Multiple port support for active/active operation

### Media interfaces

- > XAU1/CX4/KX4/SGMII

### Bus interface

- > PCI Express x8 v1.1

### Layer 2 network interface

- > Checksum offload (TCP, UDP, IP)
- > Large send offload
- > Jumbo frame (9000 B)
- > Receive side scaling (RSS)
- > PXE 2.0 remote boot

### TCP/IP offload

- > Pipeline accelerated TCP/IP
- > Accelerated receive window size of 512 KB
- > Jumbo frame (9000 B)
- > Architectural support for up to 64,000 accelerated connections with 4-GB memory

### iWARP (RDMA over Ethernet)

- > RDMAC v1.0 and IETF specification support
- > User-level and kernel-level direct access support
- > Direct placement of payloads into application memory
- > Up to 32 independent accelerated IP addresses
- > Concurrent support for up to 64,000 simultaneous iWARP connections

### Block and file storage

- > iSCSI support on Linux through Linux Open-iSCSI and Microsoft iSCSI initiators
- > iSCSI enabled over RDMA (iSER) for Linux
- > NFS and NFS/RDMA, CIFS
- > Architectural support for up to 64,000 accelerated connections with 4-GB memory

### Virtualization support

- > Supports up to 16 virtual NICs
- > Multiple PCI functions and MAC addresses
- > VLAN support
- > Support for virtual operating environments

### Memory

- > Architectural support for up to 4-GB DDR2 SDRAM external memory

### Standards

- > IEEE 802.3-2005: 10GbE link aggregation, link pause, management
- > IEEE 802.3ae 10Gb Ethernet over fibre
- > IEEE 802.3ak CX-4
- > IEEE 802.1p Priority Encoding
- > IEEE 802.1Q VLAN Tagging with support for 4096 VLANs
- > IPv4 (all connections)
- > IPv6 (unaccelerated connections)
- > IETF RFCs: 793, 1323, 2581, 3782

### Management

- > IETF MIBs supported (including required statistics hardware counters); Ethernet, Interfaces, IP, UDP, TCP, TCP MIB II
- > ACPI 2.0c and PCI Power Management 1.2 compliant
- > Configuration and diagnostic tools

### APIs/Middleware

- > Sockets and standard NIC
- > Winsock Direct
- > OpenFabrics and NetEffect iWARP Verbs
- > uDAPL v1.2, v1.3
- > HP-MPI, Intel MPI, Scali MPI, MVAPICH2

### Operating systems

- > Microsoft Windows® server 2003 (32 bit and 64 bit), Vista (32 bit & 64 bit), and XP Pro
- > Linux 64-bit and 32-bit support for v2.6-based kernels including: RHEL4, FC5, FC6, SLES10, SLES9, Suse10

### Physical and environmental

- > Voltage: 1.1V +/- 5%, 1.8V +/- 5%, 2.5V +/- 5% (3.3V tolerant)
- > Power (typical): 3.8 W (full load)  
Power (max): 4.7 W (single port), 5.2 W (dual port)
- > Operating temperature: 0 to 65 °C
- > Package: 928-pin, 35 mm x 35 mm HFCBGA, 1-mm ball pitch
- > Process: TSMC 90G

### Certifications

- > RoHS compliant

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