Intel NetEffect and Force10 Networks

Delivering High Performance and Low Latency Solutions with 10 Gigabit Ethernet

- First full iWARP Ethernet implementation
- Highest-performance, lowest-latency Ethernet solutions
- Fully compatible with existing Ethernet infrastructure

10 Gbps
iWARP Ethernet solution
virtually eliminates system overhead due to networking and maximizes performance

High Performance
Ethernet Solution

- **7+ Gbps** throughput
- **<9 µsec** latency (application to application)
- **<10%** processor utilization for standard Ethernet frames

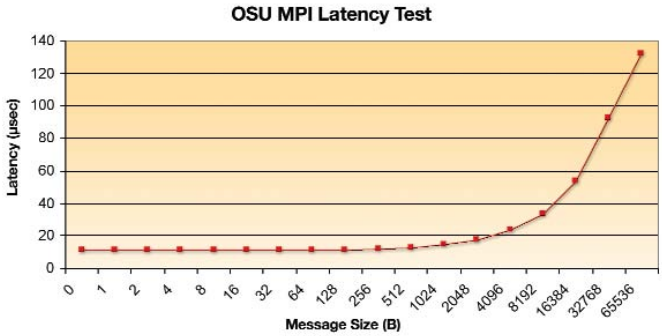
Lower TCO over Common Ethernet Infrastructure

High Performance, Low Latency Ethernet Solutions for Today's Data Centers

The transition to 10 GbE is underway in the data center, and the ubiquity and reliability of Ethernet make it the most desirable solution for delivering 10 GbE performance. Intel NetEffect's 10 GbE iWARP Ethernet Channel Adapters (ECA) are the first to fully implement the iWARP Ethernet standards which eliminate 100% of the system overhead due to networking, delivering high bandwidth, high throughput and low latency Ethernet solutions for the rigorous demands of networking, storage, and clustering applications.

The combined best-of-breed 10 GbE technology using Force10 Networks low latency switches and Intel NetEffect 10 GbE iWARP Ethernet adapters delivers a new breakthrough in high throughput and low latency, facilitating mainstream data center adoption of 10 GbE.

The standards-based nature of Ethernet and TCP/IP enable IT staff to leverage existing skills and tools to reduce the total cost of ownership and complexity of data center operations – common spares, common software, common training for networking, storage, and clustering. Data center managers can now fully realize 10 Gbps data throughput with extremely low overhead while remaining completely compatible with existing Ethernet infrastructures.



MPI Latency With Intel NetEffect NE010 ECA and Force10 Networks S2410 Switch

High Performance Ethernet Solution

- First full iWARP implementation virtually eliminates network overhead and latency issues
- Support for hundreds of thousands of connections

Converged Single-Fabric Architecture

- Networking, storage and clustering over Ethernet for any topology
- Simultaneous support of iWARP, iSER, iSCSI and standard TCP/IP traffic

Lower Total Cost of Ownership

- Wall clock reduction increases server productivity and cluster efficiency
- Increases utilization of computer assets which improves ROI

DELIVERING HIGH PERFORMANCE AND LOW LATENCY SOLUTIONS WITH 10 GIGABIT ETHERNET

S-Series S2410CP

S-Series S2410P

Force10 S-Series Specifications

Physical

S2410CP: 20 line rate 10GBase-CX4 ports plus four 10 GbE pluggable XFP or CX4 interfaces

S2410P: 24 line rate 10 GbE XFP ports

1 RJ-45 console/management port with RS-232 signaling
1 RJ-45 Ethernet management port

Size: 17 w x 16.73 d x 1.73" h (432 x 425 x 44 mm)
Weight: 12.0 lbs (5.5 Kg)
Power Supply: 100-240V AC, 50-60Hz, autosensing
Maximum power consumption:
S2410CP: 100W
S2410P: 150W
19" rack mountable
Standard 1U chassis height
Maximum Operating Specifications:
Temperature: 32° to 104°F (0° to 40°C)
Operating humidity: 10 to 90 percent (RH), non-condensing
Maximum Non-operating Specifications:
Storage Temperature: –4° to 158°F (–20 to 70°C)
Storage humidity: 10 to 95 percent (RH), non-condensing

Redundancy

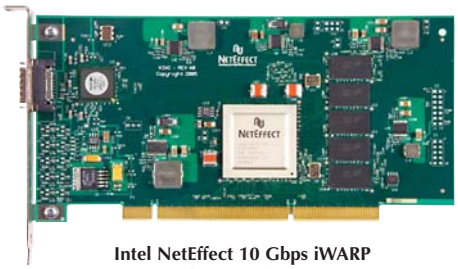
Load-balancing and Redundant AC Power

Performance

Layer 2/MAC Addresses:	16K
Switching Fabric Capacity:	480 Gbps (360 Mpps)
Jumbo Frame Support:	10,240 byte packet support
Link Aggregation:	12 members per link aggregation group and 12 groups per system
Queues per port:	4
VLANs:	1024 VLANs with 4096 tag value support

IEEE Compliance

802.3ae	10 Gigabit Ethernet
802.3ak	10 Gigabit Ethernet CX4
802.1p	L2 Prioritization
802.1Q	VLAN Tagging, GVRP
802.1s	Multiple Spanning Tree Protocol
802.1w	Rapid Spanning Tree Protocol
802.3ad	Link Aggregation with LACP
802.1D	Bridging, GARP, GMRP
802.3x	Flow Control
802.1ac	Frame Extension for VLAN tagging
802.1x	Port based Network Access Control



Intel NetEffect 10 Gbps iWARP Ethernet Adapter

Intel NetEffect 10 Gbps iWARP Ethernet Adapter Specifications

iWARP

Supports RDMAC v1.0 and IETF specifications
User-level and kernel-level access
Direct placement of payloads into application memory
Up to 32 independent accelerated IP addresses
Concurrent support for up to 64,000 simultaneous iWARP connections with standard configuration (upgradeable to support 256,000 iWARP connections)

TCP/IP Offload and Basic Ethernet NIC

Pipeline accelerated TCP/IP
TOE receive window size of 512 KB
Port MTU of 1500 Bytes

Virtualization Ready Architecture

Multiple virtual NICs supported
Support for multiple PCI functions and multiple MAC addresses
Capacity and performance supporting the demands of multiple guest OSs

General Features

Effective interrupt coalescence
Support for message size up to 4 GB
4096 entry ARP table
48 configurable unicast or multicast Ethernet MAC addresses
256 MB ECC protected industry standard DDR2 memory (upgradeable to 4 GB)

Network Interface

Full bandwidth 10 Gigabit Ethernet support
10 Gigabit Channel Adapters support CX4 copper and SR fiber cabling

Host Interface

PCI-X v1.0a 64 bit 66-133 MHz host interface, short add-in card form factor compliant (NE010x)
PCIe x8, low-profile card form factor (NE010e)

Standards

IEEE 802.3ae
IEEE 802.3ak
IEEE 802.3-2002 Flow Control

APIs/Middleware

MPICH2 v1.01
uDAPL v1.2
Winsock Direct (automatic detection and use)
OpenFabrics & Intel NetEffect iWARP Verbs
Sockets and standard NIC

Software

Microsoft® operating systems — Windows® Server 2003 (32 bit & 64 bit), Windows® 2000 (32 bit)
Linux 64 bit and 32 bit support: FC4 (v2.6.11), RHEL4 (2.6.9), SLES10 (2.6.13)
Linux 32 bit only support: RH9 (v2.4.20)
TCP/IP MIBs and MIB II support
Configuration and diagnostic tools

FORCE10

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