Chelsio Communications
Accelerate

The Chelsio Advantage

- Unified Wire
- TOE
- RDMA/iWARP
- iSCSI

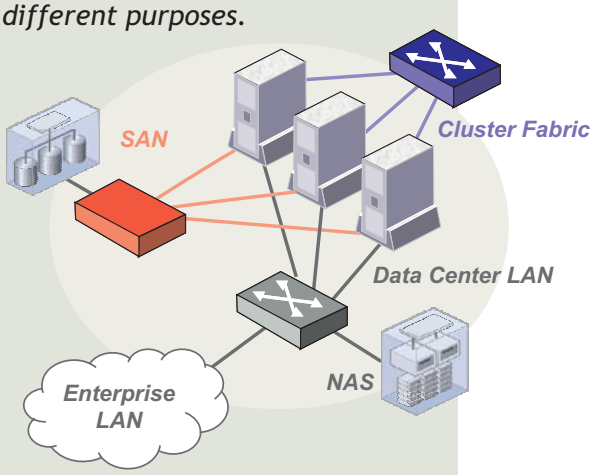
The Global Leader in 10Gb Ethernet

Advantage Chelsio
Unified Wire

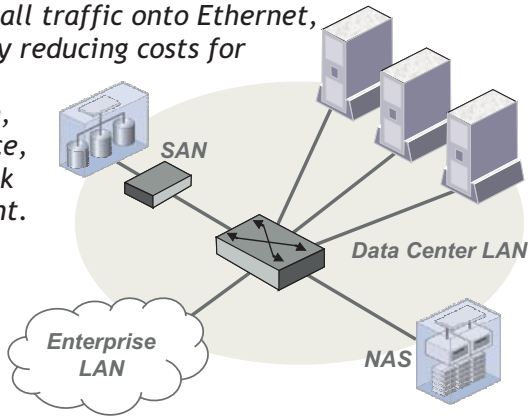
Chelsio's Unified Wire architecture simultaneously supports networked applications which traditionally required different fabrics such as Fibre Channel, InfiniBand, and Ethernet over a single Ethernet network, while individually matching the performance and capabilities of each specialized interconnects.

The T3 engine transforms Ethernet into a reliable, high-speed, traffic-managed fabric. It provides the required support for handling the different applications, as well as the critical pieces needed to preserve their performance levels while sharing the same infrastructure.

Data center using multiple high-speed networks for different purposes.



Chelsio-powered 10Gb Ethernet provides the performance boost and protocol support to enable converging all traffic onto Ethernet, significantly reducing costs for equipment, installation, maintenance, and network management.



TOE

- Linux
- Chimney

Advantage Chelsio

TCP Offload Engine

At multi-Gigabit Ethernet speeds, TCP/IP protocol processing consumes a large fraction of a host system's CPU and memory subsystem, resulting in little or no resources left for useful applications to run on the system.

Chelsio's TCP offload engine (TOE) offloads the processing of the entire TCP/IP stack to the network interface card. In addition, unlike stateless offload approaches, Chelsio's full TCP offload supports direct data placement (DDP) which eliminates the expensive copies between operating system and application buffers required in software stacks. The result is a dramatic reduction in host system CPU and memory subsystem utilization, and a corresponding increase in application performance.

Chelsio's TCP implementation rivals popular operating systems' stacks in RFC compliance. Each connection is fully processed in hardware, including establishment, teardown, and exception handling. In addition, unique support for high-speed operation is designed into the hardware engine, allowing very fast loss recovery times and robust performance in the presence of packet loss in the network. Furthermore, the offload core is tightly integrated with the following for optimal performance:

- Traffic management and engineering
- Virtualization
- Packet filtering and steering

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RDMA/ iWARP

Chelsio's iWARP adapters are the first, and currently the only, adapters to be supported by the OpenFabrics Alliance Enterprise Distribution (OFED) for the Linux operating system.

Remote Direct Memory Access

Chelsio implements Remote Direct Memory Access (RDMA) in the S-series Storage Accelerators and the R-series iWARP Adapters. RDMA allows data movement directly from the memory of one computer into that of another without involving either one's operating system, permitting high-throughput, low-latency networking, which is highly desirable in parallel computer clusters.

Chelsio's high-performance adapters support zero-copy networking by enabling the network interface card to transfer data directly to or from application memory, eliminating the need to copy data between application and operating system buffers. When an application performs an RDMA Read or Write request, the application data is delivered directly to the network by the network adapter, reducing latency and enabling fast message transfer. Such transfers require no work to be done by CPUs or context switches, and transparently proceed in parallel with other system operations.

RDMA eliminates protocol overhead that can choke the capacity to move data across a network, reduce application performance and restrict the size and scalability of a cluster.

Internet Wide Area RDMA Protocol

Chelsio fully supports the RDMA Consortium's Internet Wide Area RDMA Protocol (iWARP), and the Internet Engineering Task Force's update of the RDMA Consortium's iWARP standard.

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iSCSI

SCSI over IP

Internet SCSI (iSCSI) is a transport layer protocol that allows the use of the SCSI protocol over IP networks.

iSCSI-based storage area networks (SANs) in enterprise networks are gaining wide acceptance, thanks to simplified management and reduced cost. iSCSI is even more appealing with 10Gb Ethernet, which supports higher speeds than Fibre Channel. Tests with Chelsio's iSCSI Storage Accelerators have shown excellent performance for iSCSI SANs, matching or exceeding Fibre Channel numbers.

Chelsio's high-performance Storage Accelerators significantly speed up the iSCSI protocol for block-level storage traffic between servers and storage systems. The adapters offload the expensive byte-touching iSCSI operations and payload placement to greatly improve SAN performance and reduce CPU and memory utilization on storage servers.

Chelsio's T3 iSCSI support includes:

- Header and data digest (CRC) generation and checking
- PDU recovery
- Direct data placement (DDP) of payload

In addition, Chelsio's iSCSI offerings include:

- iSCSI Boot
- Full iSCSI initiator and target mode software stack

Chelsio's iSCSI stack is especially tuned to take advantage of Chelsio's Storage Accelerator features to provide the best possible performance for critical storage applications.

Chelsio provides the most comprehensive selection of 10Gb Ethernet adapters in the industry.

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