Chelsio

Chelsio® T420 low latency server connectivity brings capacity and efficiency to advanced High Frequency Trading application infrastructure.

LOW LATENCY MARKET DATA MESSAGING

High Frequency Trading has transformed the investment landscape, accounting for over two thirds of current volume. But as traffic and complexity increase, so do the consequences of inefficiencies in your network. When microseconds count for so much, why risk profitability by choosing slower network interface cards for your trading infrastructure?

Cost-Effective, Real Time Financial Data Streaming

Now, Chelsio has delivered UDP socket connectivity with the shortest delay available in a network interface card. In recent tests with Chelsio partners, the T420-LL-CR was found to deliver 3.0 µS UDP Queue Pair and 3.2 µS UDP User Mode latency, as shown in the Latency chart in Figure 2.

Moreover, the Chelsio dual-port 10GbE adapter reaches line-rate at a very early 648 byte packet size.

In the Transactions Per Second chart, with small packet sizes, this test displays the T420's superior suitability to High Frequency Trading systems small packet size latency requirements with UDP multicast message streams.

These charts also demonstrate the scalability provided by the T420-LL-CR's 4th generation T4 ASIC—essential to support continuous low latency operation during market data spikes.

> **"...the Chelsio T420 showed UDP Queue-Pair latency of just 3.0 microseconds..."**

Features and Capabilities Combined for the Best Overall Performance

Chelsio's second generation iWARP (RDMA over Ethernet) design builds on the RDMA capabilities of T3, with continued MPI support on Linux with OpenFabrics Enterprise Distribution (OFED), and Windows HPC Server 2008.

T3 is already a field-proven performer in Purdue's 1300-node cluster, and the T4 design reduces RDMA latency from T3's already low 6.8 microseconds to about 3.7 microseconds through T4's increased pipeline speed.

This demonstrates the linear scalability of Chelsio's RDMA architecture to deliver comparable or lower latency than InfiniBand DDR or QDR and scale smoothly as connections or queue pairs are added in real world applications.

Enhanced Storage Offloads

T4 offers protocol acceleration for both file and block-level storage traffic. For file storage, T3 and T4 support full TOE under Linux and TCP Chimney under Windows. T4's fourth-generation TOE design adds support for IPv6, which has become a requirement for many government and wide-area applications. For block storage, T4 supports partial or full iSCSI offload of processor-intensive tasks such as PDU recovery, header and data digest, CRC generation/checking, and direct data placement (DDP), supporting VMware ESX.

Figure 1.
The high-performance, dual-port Chelsio T420-LL-CR 10GbE Unified Wire Adapter

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Broadening Chelsio's support for block storage, T4 adds partial and full FCoE offload. With an HBA driver, full offload provides maximum performance as well as compatibility with SAN management software.

For software initiators, Chelsio supports the Open-FCoE stack and T4 offloads certain processing tasks much as it does in iSCSI. Unlike iSCSI, FCoE requires enhanced Ethernet support for lossless transport, Priority-based Flow Control (PFC), Enhanced Transmission Selection (ETS) and Data Centre Bridging Exchange (DCBX).

Conclusion

Chelsio's T420-LL-CR network interface card achieves all the requirements to make it ideal for low latency High Frequency Trading operations. At the same time, when combined with iWARP, enabling NFSiWARP, LustreiWARP and similar protocols, the T420-LL-CR makes for an ideal Unified Target adapter, simultaneously processing iSCSI, FCoE, TOE, NFSoRDMA, LustreoRDMA, CIFS and NFS traffic.

So if you would prefer to use one card throughout your enterprise data center or private cloud, choose the T420-LL-CR; the unified wire adapter that does it all while doing it best.
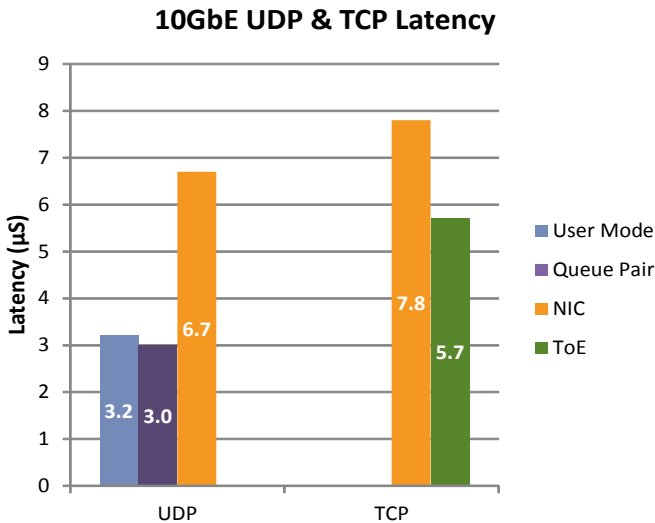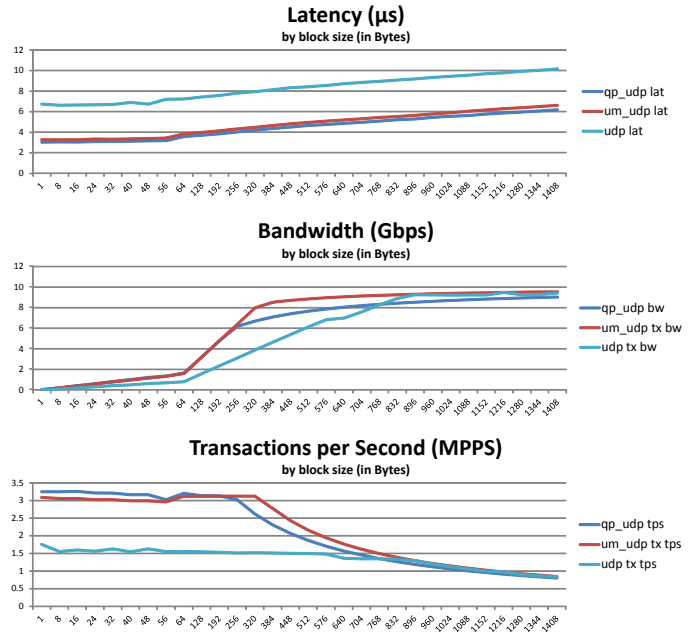
Figure 2.
Chelsio T4 Latency, Bandwidth, and Transactions per Second, by packet size, supporting NIC functionality as well as kernal bypass UDP in Queue Pair as well as User Mode

10GbE UDP & TCP Latency

Figure 3.
Chelsio's T4 ASIC brings low latencies to UDP and TCP traffic

About Chelsio Communications

Chelsio Communications is the market and technology leader in advanced, low-latency server connectivity, enabling the convergence of networking, storage and clustering traffic over 10Gb Ethernet.

Terminator ASIC technology is proven in more than 100 OEM platforms with the successful deployment of more than 100,000 ports, and now Chelsio is leading the way again, with its recently announced T4 ASIC technology. With Terminator 4, Chelsio has taken the unified wire to the next level, providing full offload for TCP, iSCSI, iWARP and Fibre Channel over Ethernet, relieving servers and storage systems of processing overhead, and bringing its adopters dramatic increases in application performance.

To learn more, contact your Chelsio sales representative at sales@chelsio.com, or visit us at www.chelsio.com.

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