CHELSIO DEMONSTRATES 100 GIGABIT NVMe™/TCP PERFORMANCE USING T6 TCP/IP OFFLOAD ENGINE (TOE)

Showcases Extreme Storage Performance for Kernel and User Space NVMe/TCP

SUNNYVALE, CA – September 22, 2020 – Chelsio Communications, Inc., a leading provider of high performance (1Gb/10Gb/25Gb/40Gb/50Gb/100Gb) Ethernet Unified Wire Adapters and ASICs for storage networking, virtualized enterprise datacenters, cloud service installations, and cluster computing environments, today announced the results of a demonstration of NVM Express (NVMe) over TCP using the latest generation of Chelsio T6 100GbE TCP/IP Offload Engine silicon. The demonstration is based on software conforming to the specification of NVMe over TCP (NVMe/TCP) as defined by the NVM Express, Inc.

NVMe provides a standards-based approach for PCI Express (PCIe) SSD access that significantly improves performance by reducing latency and streamlining the command set, while providing support for security and end-to-end data protection. NVMe over Fabrics defines an efficient mechanism to utilize these devices in large scale storage deployments and provides investment protection by allowing the latest in innovations and advances in low latency SSD flash. This enables the NVMe storage devices to be shared, pooled, and managed more effectively. NVMe/TCP defines the mapping of NVMe queues, NVMe over Fabrics (NVMe-oF™) capsules and data delivery over the IETF Transport Control Protocol (TCP). It is available in the latest Linux kernels and Storage Performance Development Kit (SPDK).

The Chelsio demonstration is aimed at providing a foundation for lower latency and increased performance, while providing improved NVMe integration over existing datacenter IP networks. Chelsio's TOE (TCP/IP Offload Engine) is fully capable of offloading the TCP/IP processing of Kernel and User space SPDK NVMe/TCP target to hardware at 100Gbps. It

provides a low latency, high throughput and CPU-efficient Ethernet solution for connecting high performance NVMe SSDs over a scalable, congestion controlled and traffic managed fabric.

The unique ability of a TOE to perform the full transport layer functionality in hardware is essential to obtaining tangible benefits. The vital aspect of the transport layer is process-to-process communication, i.e. the data passed to the TOE comes straight from the application process, and the data delivered by the TOE goes straight to the application process. With its ultra-high performance, the T6 100GbE TOE solution adds only approximately 5.5 microseconds of remote NVMe access latency relative to local NVMe access and delivers line-rate 99 Gbps throughput for both READ and WRITE operations.

Chelsio demonstrates that accessing flash remotely does not need to come at the expense of performance, ease of deployment, network scalability or error recovery. Chelsio T6 100GbE Unified Wire offering enables a seamless migration path from 10/40GbE to 400GbE in the future, while offering the flexibility to fully leverage existing software investments. In addition, 100Gb iSCSI capability of the T6 silicon, allows an instant path to revenues for customers into an existing market. Customers will not need to choose between iSCSI and NVMe over Fabrics when it comes to the choice of the adapter or switch.

Chelsio's TOE technology inherits the resilience and congestion management capabilities of TCP/IP and as such can turn any Ethernet topology into a high-performance resilient fabric. Unlike competing technologies, it does not require a lossless fabric or special switch features to operate. Therefore, end users can decouple the storage and switch upgrade cycles, and benefit from incremental installs. Storage vendors in turn can deploy into any pre-existing Ethernet TCP/IP datacenter infrastructure.

Using 100GbE TOE, storage system OEMs and device vendors can easily add the latest generation of Ethernet TCP/IP fabric connectivity to any existing NVMe device. NVMe over

TCP (TOE) enables end-users to connect remote subsystems with flash appliances, leveraging 100G NVMe/TCP technology to achieve extreme application response times and highest scalability across virtual datacenters. The NVMe/TOE solution also consumes up to 50% less CPU per Gbps compared to software based NVMe/TCP, resulting in hardware offloaded TCP solution to be a much more cost-effective solution.

The complete T6 100GbE NVMe over TCP (TOE) benchmark paper, detailing the hardware/software configuration used and results achieved, is available here.

"The T6 100GbE controller enables the development of next generation flash-optimized storage for applications to achieve the highest system performance and utilization, while maximizing return-on-investment" said Kianoosh Naghshineh, CEO at Chelsio Communications. "NVMe over TCP requires sharing of flash storage across multiple applications using the most efficient, highest-performance networking available. We view T6 TOE-enabled storage solutions to be a critical tool in meeting these business goals."

"Boosting application performance, efficiency, and effectiveness of server CPUs are key priorities for datacenter environments" said Greg Schulz, Sr. Analyst, Server StorageIO. "The Chelsio NVMe over Fabrics 100GbE NVMe/TCP (TOE) demonstration provides a solid proof of how high-performance NVMe solid state devices can help datacenters boost performance and productivity, while getting the best return on investment of data infrastructure assets, not to mention optimize cost-of-ownership at the same time."

About Chelsio Communications
Chelsio is a recognized leader in high performance (1Gb/10Gb/25Gb/40Gb/50Gb/100Gb) Ethernet adapters for networking and storage within virtualized enterprise datacenters, public and private hyperscale clouds, and cluster computing environments. With a clear emphasis on performance and delivering the only robust offload solution, as opposed to simple speeds and feeds, Chelsio has set itself apart from the competition. The Chelsio Unified Wire fully offloads all protocol traffic, providing no-compromise performance with high packet processing

capacity, sub-microsecond hardware latency and high bandwidth. Visit the company at www.chelsio.com and follow the company on Twitter and Facebook.

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