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CHELSIO ANNOUNCES VOLUME SHIPMENTS OF T6 UNIFIED WIRE LINE OF PROTOCOL OFFLOAD ADAPTERS

10/25/40/50/100Gbps Line Rate, High IOPS Performance for iSCSI, SMB Direct, NVMe over Fabrics, and Encryption – Lowest Power 100GbE Adapter Solution in Industry

SUNNYVALE, CA – January 19, 2017 – Chelsio Communications, Inc., a leading provider of high performance (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 volume shipments of the Terminator 6 (T6) 10/25/40/50/100Gb Ethernet (GbE) network adapters based on the sixth generation of its hyper-virtualized Unified Wire ASIC architecture.

The T6 powered adapters are the industry's highest performance Ethernet interfaces, scaling to deliver 100Gbps wire speed bandwidth, ultra-low latency and high message processing capacity. The new adapters are also the lowest power 100GbE solution in the industry, requiring a passive heat sink and a maximum of 200 Linear Feet per Minute (LFM) airflow, while delivering 100Gbps speeds, enabled by the exceptionally low power 32nm SOI process from Global Foundries. With a comprehensive suite of offloaded storage, compute and networking protocols – including iWARP (RDMA/TCP), TCP/IP, UDP/IP, NVMe over Fabrics, iSCSI Offload and FCoE with T10-DIX, IPsec, TLS/SSL, DTLS; T6 enables network convergence and provides unprecedented performance in virtualized environments, while dramatically increasing host system efficiency and lowering communication overhead.

Support for integrated TLS/SSL, DTLS, IPsec and SMB 3.X crypto in the T6 adapters allows for tremendous differentiation for the end product. For example, T6 adapters are capable of

encrypting/decrypting network data at line rate and in an in-line fashion (with or without integrated TCP Offload Engine), while concurrently performing encryption/decryption of storage data in a co-processor mode, thus enabling concurrent secure communication and secure storage, all for the price and power of a typical NIC. Support for the co-processor mode of T6 encryption is already part of the Linux kernel, thus enabling full encryption/decryption functionality at no additional price/power premium to that of a regular NIC.

The new T6 adapters enable fabric consolidation by simultaneously supporting TCP/IP and UDP/IP socket applications, RDMA applications and SCSI applications at wire speed, over legacy switching infrastructure, thereby allowing InfiniBand and Fibre Channel applications to run unmodified and concurrently over standard Ethernet in BSD, Linux and Windows environments. They run all the host software of its predecessor, T5, as-is, thus enabling leveraging of all the prior software investment. They offer all the features of T5, and in addition, add support for integrated offload of IPsec, TLS/SSL, DTLS and SMB 3.X crypto.

"Terminator 6 is another first silicon success, similar to T5 – going to production within 100 days of power-on. T6 confirms yet again the consistent and scalable nature of Chelsio's architecture, allowing the customers to leverage 100% of their software investment with T5, in a power and performance efficient solution, at the new 100Gb Ethernet speed bump. In addition, T6 substantially raises the bar for datacenter networking by combining low latency, low power, high performance, and integrated encryption, allowing differentiation for a secure datacenter", said Kianoosh Naghshineh, CEO at Chelsio Communications. "By selecting T6, customers know that when the 200Gb and 400Gb Ethernet speed bumps arrive, Chelsio's solution will be there in time to leverage all their software investment, and ship the new speed cards in the existing platforms' power/airflow envelope."

"The adoption of off-premises cloud services with hybrid cloud architectures and move to new application architectures with micro-services is a significant trend," said Clifford Grossner, Ph.D., senior research director & advisor for cloud, datacenter and SDN at IHS Markit. "In a

recent IHS Markit report, respondents indicated they expected on average 60% of their physical servers would be running VMs or containers, with on average 41 VMs per virtualized server by 2018, which will drive the need for high performance and low power offload Ethernet Network adapters enabling network convergence, and to meet performance requirements of virtualized environments."

Key Features of T6 Unified Wire Adapters

Operating System and Hypervisor support:

- Inbox driver support for Linux kernel.org v4.9, RHEL 7.3 and SLES 12 SP2.
- Inbox driver support for FreeBSD, including TOE support (achieving 100Gb of TCP Offload traffic for a single connection at 1% CPU utilization).
- Driver support for Windows Server 2012 R2, Windows Server 2016 and Windows 10 Enterprise.
- NVIDIA GPUDirect RDMA.
- Driver support for VMware ESXi 6.0 and 6.5.
- SRIOV support with VMware, KVM, Xen, and Hyper-V Hypervisors.

Protocol Offload support:

- Support for NVGRE, VXLAN and GENEVE offloads.
- Networking: TCP/IP Offload (TOE), iWARP (RDMA/TCP), UDP, DPDK and OVS Offload.
- Storage Offloads: iSCSI, iSER, FCoE and NVMe-oF.
- Crypto: IPsec, TLS/SSL, DTLS and SMB 3.X crypto.
- Other: Traffic Management, Classification, Precision Time Protocol (PTP) and Wire Direct (user-mode queues and TCP and UDP Offload, similar to Open-Onload).

Other:

- Support for auto-detection and auto-negotiation.
- Support for MCTP over PCIe and PLDM over MCTP, NCSI.
- IEEE 802.1Qbg, 802.3bj, 802.3bm.

- 8 PF, 256 VF.
- PXE, uEFI boot for IPv4 and IPv6.
- Class A, RoHS 7CIII compliant.

Hardware Features:

- PCI Express v3.0 x16 host interface.
- Optional DDR-3/4 memory interface for high capacity applications.
- 2x1/10/25/40/50/100GbE ports.
- Low power envelope – maximum of 200 LFM airflow at 100Gbps speeds.

The adapters fall into two groups: Unified Wire and Server Offload. Unified Wire cards run the full suite of features. Server Offload adapters are high value stateless offload cards with full offload capability for a limited number of connections; to be delivered in 2Q17.

The following are the currently available T6 adapters. All adapters have a low profile form factor and a PCI Express Gen3 host bus interface.

SKU	Type	Ports	Speed (Gbps)	PCIe
T6225-CR	Unified Wire	2	1/10/25	x8
T6225-LL-CR	Unified Wire, Low Latency	2	1/10/25	x8
T6225-SO-CR	Server Offload	2	1/10/25	x8
T62100-LP-CR	Unified Wire	2	40/50/100	x16
T62100-CR	Unified Wire, iSCSI Optimized	2	40/50/100	x16
T62100-SO-CR	Server Offload	2	40/50/100	x16

More Details

T6 ASIC Architecture: T6 ASIC Architecture White Paper

T6 Encryption Offload: T6 Crypto White Paper

T6 ASIC Product Brief: T6 ASIC Product Brief

T6 Adapter Product Selector: T6 Adapter Product Selector

T6 Adapter Product Briefs: T6 Adapter Product Briefs

T6 Adapters Walkthrough Video: T6 Adapter Videos

Availability and Pricing

The cards are list priced from $499 to $1299, depending on the SKU. All software is included without a licensing fee. Linux and FreeBSD software are available in source form.

About Chelsio Communications

Chelsio is a recognized leader in high performance (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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Information based on IHS Technology September 2016 Data Center Strategies North American Enterprise Survey. Information is not an endorsement of Chelsio. Any reliance on these results is at the third party's own risk. Visit IHS Markit Technology for more details.