Overview

Chelsio’s T540-BT is a quad port 10GBase-T 10 Gigabit Ethernet Unified Wire adapter with PCI Express 3.0 host bus interface, optimized for storage, cloud computing, HPC, virtualization and other datacenter applications.

The fifth-generation T5 ASIC technology from Chelsio provides the highest performance available and dramatically lowers host-system CPU communications overhead with on-board hardware that offloads TCP/IP, iSCSI, FCoE and iWARP RDMA processing from its host system. This will enable savings in host CPU acquisition costs, power and operational costs, and dramatically increases system performance.

A large portion of offloads enabled by T540-BT are based on standard TCP, IP, UDP protocols (such as iSCSI and iWARP), and thus can operate with a software peer, or be replaced with a software solution at lower performance, thus providing the requisite reliability for enterprise customers, and allowing incremental installs in the datacenter. It will work with any legacy switch infrastructure and does not rely on new features such as DCB, PFC, ETS, etc.

T540-BT supports IEEE standards-based link aggregation/failover features, as well as inter-adapter failover techniques that make it ideal for critical network applications requiring redundancy and high-availability capabilities. It also includes an integrated Traffic Manager and a built-in eSwitch for robust network traffic flow control, traffic classifier, load balancer, Firewall capabilities at the port level.

FCoE and iSCSI support in T540-BT benefit from high reliability features that include memory ECC, data path CRC and T10-DIX offload, in addition to the checksums and CRC available at different protocols layers. High performance iSCSI and FCoE provide a drop-in replacement upgrade from legacy SANs to converged networks.

The Unified Wire Solution

T540-BT enables a unified wire for LAN, SAN and cluster applications, built upon a high bandwidth and low latency architecture along with a complete set of storage and cluster protocols operating over Ethernet (iSCSI, NVMe-oF, FCoE and iWARP). A unified wire means having the ability to utilize all offload or non-offload protocols at the same time, over the same link, using the exact same firmware, host software, and adapter. Thus, a given system using T540-BT can be easily targeted at different vertical markets and a variety of useful functions enabled (i.e. dial the bandwidth to a given application and assign access control, while offloading only part of the traffic). The Ethernet-only networking thus reduces the infrastructure costs in network adapters, cables, switches, rack space, power, equipment spares, management tools, planning, networking staff and installation.

Specifications

Host Interface
- PCI-E Gen3 x8
- MSI-X, MSI and support for legacy pin interrupts

Virtualization
- PCI-SIG SR-IOV
- 128 Virtual and 8 Physical functions
- 140 port virtual switch
- EVB, VEPA, Flex10, VTan
- 512 MAC addresses
- Offload 802.1 Qbg/h
- NVGRE, VXLAN and GENEVE support
Fifth-Generation Protocol Offload Engine
The T5 is Chelsio’s fifth-generation TCP offload (TOE) design, fourth-generation iSCSI design, and third-generation iWARP (RDMA) implementation. With support for the 8 Gbps Gen 3 data rate, it provides 64 Gbps of raw bandwidth to the server. It also provides support for PCIe SR-IOV virtualization with embedded virtual switch.

Complete and Flexible TCP Offload
The T540-BT transport engine executes programmable firmware and is configurable with hundreds of registers for protocol parameters, RFC compliance and offload control. It can offload protocol processing per connection, per-server, per-interface, while simultaneously providing complete stateless offload for non-offloaded connections (processed by operating systems stack running on host CPU). It also provides a flexible direct data placement capability for regular TCP sockets, with all the benefits of zero-copy and kernel bypass without rewriting the applications.

Packet Switching and Routing
T540-BT integrates a high performance packet switch, which allows switching traffic from any of the input ports to any of the output ports (wire-to-wire) and from any of the output ports to any of the input ports (host-to-host).

Robust, Proven Solution
Subjected to thousands of hours of compatibility testing, over a decade of stress testing by several OEM test suites and production deployment in servers, storage systems, and cluster computing, Chelsio’s robust, stable protocol offload technology delivers proven performance in a wide range of environments.

Software Drivers
Chelsio offers a full suite of protocol software drivers with the T540-BT adapters. See http://www.chelsio.com/support for the latest information. The software suite supports operation in both stateful and stateless offload modes for all major operating systems.

Ordering Information
Model: T540-BT
Physical Interface: Quad port RJ-45 / 10GBase-T
Connector: RJ-45 / Cat-6a
Media: Twisted Pair

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