

CATS™ - 1.1 TFLOPS DOUBLE PRECISION IN 1U

CLEARSPED ACCELERATED TERASCALE SYSTEM

CATS - Overview

Extremely high performance and power efficient systems are required to enable future breakthroughs in areas ranging from commerce, science to security. The ClearSpeed Accelerated Terascale System (CATS) is an enterprise-class 1U rack module that is the *ultimate* in compute density. Packed with twelve e710 Advance™ Accelerator cards, each CATS unit delivers around 1.1 TeraFLOPS of double precision, energy-efficient performance. Designed to work in parallel with industry-standard servers, CATS meets the requirement of reliability and accuracy. Multiple CATS units can be used to create *extremely* powerful clusters delivering maximum absolute performance for given space and energy budgets.

Benefits

CATS allows you to build much faster systems within given power, space and cooling budgets. A CATS accelerated system can enable simulations of much larger problems, or slash turn around time on a fixed size job. The energy efficiency of the CATS units also means that your simulations will cost much less to run, and emit a fraction of the CO₂ of an unaccelerated solution.

CATS units offer an exceeding compute-dense, energy-efficient solution. CATS delivers over ten times the performance and over five times the performance per watt when compared to a quad core based high performance 1U server.

CATS incorporates the Advance product reliability features that lead the accelerator industry.

All memories in the system are fully ECC protected, avoiding silent software errors and incorrect answers. The low power design of the ClearSpeed processors enable practical petascale production systems.

Solution Examples

A CATS accelerated cluster can easily achieve 22 TeraFLOPS of enterprise-class, double precision performance in a single rack.

Key Features of CATS

RAS features	ECC on all memories, low power design
Size	Standard 1U high 19" rack
Performance	1.152 double precision TeraFLOPS (IEEE 754 compatible)
Total DRAM memory size	24 GBytes
Total DRAM memory bandwidth	96.0 GBytes/s
Typical energy consumption	400 watts
Connectivity	Dual PCIe Gen1 x8

Accelerated Application Examples

In a recent customer case study the popular life sciences application MOLPRO was used to model neuraminidase inhibitors, candidates for new vaccines for the influenza virus. Molpro has been ported to run on CATS, and the ClearSpeed accelerated version showed a 10X speedup in overall time to solution versus an unaccelerated cluster. Calculations that would normally take 10 days were reduced to a *single day* by using CATS.

MOLPRO is one of many examples of what is possible and shows the potential to achieve breakthrough performance ranging from finding cures for diseases through to computational electromagnetics.

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Software Development Kit

ClearSpeed's accelerators use a data-parallel processor architecture that simplifies programming and debugging.

The ClearSpeed Software Development Kit (SDK) is a complete suite of tools and libraries designed to enable the rapid development and porting of application software for ClearSpeed accelerators.

By using industry standard tools and languages, the SDK provides a familiar development environment, including an optimizing C compiler, a graphical debugger and visual profiling tools. The development environment is supported across a range of popular Linux[®] and Windows[™] operating systems.

Summary

When dense, reliable compute performance is needed, CATS delivers proven performance allowing breakthrough advances of real-world applications that wouldn't otherwise be possible.

CATS delivers the highest double precision performance in 1U at the greatest performance per watt. CATS is also the only enterprise class HPC accelerator, designed to deliver accurate answers and run reliably, its fully ECC-protected memory system avoiding the critical failures caused by silent software errors.

Availability

For pricing and lead time information please contact ClearSpeed sales at:

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For more information

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