



## PRESS RELEASE

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## CoSy<sup>®</sup> Compiler for 96-Core Multi-Threaded Array Processor

*ClearSpeed Technology uses ACE's CoSy technology in the development of its parallelizing software compiler*

Amsterdam, The Netherlands – 17 January 2008 – ACE Associated Compiler Experts bv, the world leader in professional compiler development tools, is proud to announce that its compiler development system CoSy has been successfully used by ClearSpeed Technology in the development of a high-performance, parallelizing compiler for its accelerator product line that includes the CSX600, a multi-threaded array coprocessor.

ClearSpeed Technology Plc, headquartered in Bristol, UK, is a world leader in acceleration for high performance computing (HPC). Based around the CSX600, the ClearSpeed Advance<sup>™</sup> accelerator cards (PCI-X and PCIe form factors) provide low-power, high-performance co-processing capabilities for a wide spectrum of numerically intensive disciplines. The CSX600 is a massively parallel processor architecture with a SIMD data path with 96 processing elements, each equipped with a dual 64-bit FPU, local registers and local memory. In close co-operation with ACE Associated Compiler Experts, ClearSpeed has developed a powerful, multi-threading compiler for the CSX600 architecture, based upon the CoSy compiler development system.

In order to support the ClearSpeed *Cn* programming language, which is a parallel extension to C, ACE has made a number of extensions to the generic, ISO C front-end of the CoSy compiler development system. The standard CoSy front-end has been enhanced with syntactic support for the *Cn* language keywords `poly` and `mono`, which are used to specify data objects to be processed in parallel by the architecture's 96 processing units. Similarly the CoSy internal representation (IR) has been extended with semantic support for `poly` and `mono`.

“The *Cn* language extensions play an important role in obtaining performance for the CSX600 architecture,” says Marius Schoorel, Managing Director at ACE. “ACE carefully integrated the `poly/mono` extensions into the compiler development framework, making sure that all optimizations in CoSy perform equally well on sequential, as well as parallel code constructs in the multi-threading programming model.”

Development of the CSX600 compiler has been performed by the ClearSpeed compiler tools team using CoSy from ACE. Approaching its version 3.0 release, the ClearSpeed software

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development kit (SDK) supports conditional execution of poly qualified expressions via masked execution on the SIMD data path.

“CoSy’s uniquely open and modular structure has made it possible for us to develop a compiler that effectively exploits the 96-way parallelism available in the CSX600 architecture,” says Andrew Wilde, director of software at ClearSpeed. “We are very pleased to have been able to build our high-performance compiler based upon the solid foundations of CoSy.”

ClearSpeed was named one of the Top 5 Companies to watch in 2007 by HPCWire.

### **About ClearSpeed**

ClearSpeed Technology is a semiconductor company that develops massively parallel coprocessors and accelerator boards delivering unmatched performance per watt for high performance computing applications on industry standard systems. ClearSpeed has offices in San Jose, California and Bristol, UK and has over 50 patents granted with additional pending. More information on ClearSpeed products and services can be found at [www.clearspeed.com](http://www.clearspeed.com).

### **About ACE**

ACE Associated Compiler Experts bv (a wholly owned subsidiary of ACE Associated Computer Experts bv, Amsterdam, the Netherlands) is a world leader in tools en services for professional compiler development. Its open CoSy compiler development system gives compiler developers the ability to achieve a leading edge position in the construction of better and faster optimizing compilers for architectures ranging from 4-bit microcontrollers to 24-bit DSPs, 256-bit VLIW processors and multicore processor systems. CoSy accommodates a wide range of programming languages including C, Embedded C, DSP-C, C++, Fortran and Java.

SuperTest is the most comprehensive test and validation suite for C/C++ compilers. Based upon 30+ years of ACE experience in compiler construction and validation, SuperTest provides a unique level of compiler test coverage.

More information on ACE and its products and services is available at [www.ace.nl](http://www.ace.nl).

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