

Mitronics has 15 employees, mostly in Sweden. The company opened a subsidiary in Silicon Valley, as the U.S. represents the largest supercomputing market.

Mohl, who serves as VP and CTO, previously founded the e-business venture Shopsense in 1999. Borg, chief engineer, previously worked at Anoto Group, where he was a key employee responsible for large parts of the software development for the C Pen, and was also engaged in ASIC/FPGA development.

The founders brought in Anders Dellson in Oct. 2002 to head the company as president and CEO. Dellson started his career as a management consultant at McKinsey & Company in Stockholm. He previously served as CEO of the Stockholm-based marketing consultancy Matroska.

Göran Sandberg rounds out the management team as VP of product marketing. Sandberg was previously product marketing manager at Switchcore, a fabless semiconductor company producing silicon for Gigabit Ethernet.

Supercomputing is about a \$10 billion market comprised of customers with large computer centers, primarily universities, large corporations and governments.

Mitronics works closely with both Cray and Silicon Graphics (SGI), the two vendors currently shipping computers with integrated FPGAs for acceleration. A variety of opportunities also exist on the embedded side, as well as PCI board solutions, where FPGAs can extend ordinary PCs. Mitronics has partnered with FPGA computing specialist Nallatech for board solutions.

The supercomputing community is excited about the potential offered by FPGAs, which can accelerate supercomputing applications 10x to 100x compared to general-purpose processors (in practice, those acceleration figures are typically in the 10x to 30x range). In addition, FPGAs consume just a fraction of the power a GPP consumes.

Mitronics' solution consists of the Mitrion virtual processor, which is a fine-grained, massively parallel configurable soft-core processor; a programming language called Mitrion-c, which is used to program a Mitrion virtual processor; and the Mitrion Software Development Kit,

consisting of a compiler, debugger/simulator, and processor configurator.

The company's programming language, Mitrion-c, is a C family language, but differs substantially from C in that it is intrinsically parallel. Mitronics designed the Mitrion-c language to help programmers reveal all the inherent parallelism in their applications.

The simulator provides users with a high-level view of what they can expect in the FPGA in terms of resource consumption, execution speed and other performance parameters. When satisfied with the results in the simulator, the user essentially just pushes a button to generate the VHDL file, which in turn is fed unaltered through the synthesis and place and route tools.

Mitronics has demonstrated that 180 lines of code in the Mitrion-c programming language can generate 150,000 lines of VHDL.

FPGA-based supercomputing is a new area just beginning to emerge, but Mitronics' unique platform solution could be one of the factors that accelerate the use of FPGAs in high-performance computing. While FPGAs easily outperform GPPs, programming is really the key challenge holding back FPGAs from delivering substantial value to high-performance computing. Software programmers are generally not electrical engineers, and even if they do have the required skills, traditional design methods consume too much time and resources.

The Mitrion platform also provides significant benefits in terms of portability. Programmers can target a new generation of computer, or switch to a new generation of FPGA, just by recompiling their source code.

Mitronics released the Mitrion platform in Oct. 2005. A perpetual license to run the Mitrion Virtual Processor on a single FPGA is \$6,995 (with volume discounts available). The Mitrion Software Development Kit has an annual support and updates fee of \$14,995.

A number of supercomputing organizations have licensed the Mitrion platform to develop FPGA-based supercomputing applications. Announced customers include:

Mitronics

While FPGAs have always been available to the supercomputing world, the problem for users has been the complexity involved in programming the devices using traditional hardware design tools. Sweden-based Mitronics has developed a new platform that enables users with no electrical engineering expertise to compile high-performance supercomputing applications into FPGAs. The Mitrion platform allows programmers to stay completely in software and avoid the difficult area of hardware description.

Recognizing the potential for FPGAs to serve as small supercomputers, founders Pontus Borg and Stefan Mohl worked for about a year in garage mode developing the solution. They officially launched Mitronics in Nov. 2002 with just under \$1 million in seed funding from Sweden's Teknoseed. Creandum and Teknoinvest led Mitronics' March 2005 \$3 million Series A round, which also included some participation from Teknoseed.

- George Mason University
- George Washington University
- McGill University
- National Cancer Institute
- National Center for Supercomputing Applications
 - Ohio Supercomputer Center
 - Oak Ridge National Laboratory
 - Stockholm Bioinformatics Center
 - Zuse Institute Berlin.

While a few customers have large installations of Cray or SGI machines, most customers have bought test samples of these FPGA-based supercomputers and are experimenting with the Mitrion platform. Mitrionics expects a boom in business as these and other customers begin ordering larger installations of FPGA-based computers in 2006.

A variety of C syntax ESL tools have emerged that also provide an alternative to using Verilog or VHDL for FPGA design. But while solutions from companies such as Celoxica, for example, can save users time as compared to using VHDL, they still represent long processes involving many thousands of lines of code.

Mitrionics' closest competitor in terms of technology is probably SRC Computer, a company that builds its own proprietary FPGA-based supercomputers. SRC offers a proprietary combination of hardware and software and, like Mitrionics, the company designs for software engineers. However, SRC competes with other HPC companies such as Cray and SGI, and not directly with Mitrionics.

Contact:

*Mitrionics (Sweden)
Scheelevägen 17
Lund, Sweden SE-223 70*

*Tel: +46 46-286 25 90
Fax: +46 46 12 98 79
Web: www.mitrionics.com.*

*Mitrionics (U.S.)
5161 Overland Ave.
Culver City, CA 90230*

*Tel: 310 558-9495
Fax: 310 841-0672*