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Company Contact

Mike Calise
Mitrionics, Inc.
Ph: 408-966-8500
Email: mike.calise@mitrionics.com

Media Contact

Joe Waldygo
TopSpin Communications, Inc.
Ph: 480-632-5050
Email: joe@topspinpr.com

Mitrionics' Accelerated NCBI BLAST Runs on World's Largest FPGA Supercomputer Built by SGI, Boosts Query Performance More Than 900 Times Over 68-Node Cluster

Mitriion Software Acceleration Platform Tested on SGI System with Off-the-Shelf RASC Components with 70 FPGAs

Supercomputing 2007, Reno, NV, November 12, 2007 – Mitrionics™, Inc., developer of the Mitriion™ Software Acceleration Platform and the Mitriion Virtual Processor, today announced that its Mitriion-Accelerated NCBI BLAST application was successfully run on the world's largest Field Programmable Gate Array (FPGA) supercomputer configuration, which was built and tested by SGI®. SGI's reconfigurable supercomputer featured 70 FPGAs, more than any single system built to date. SGI's FPGA supercomputer accelerated the performance of a complex BLAST-n query by more than 900 times, completing in less than 33 minutes what would take a 68-node Opteron-based cluster approximately three weeks to finish.ⁱ The application matched 20 nucleotide base pairs against 600,000 queries.

SGI configured the system using only off-the-shelf components, including its SGI® RASC™ (Reconfigurable Application Specific Computing) appliance for bioinformatics — Featuring Mitriion™-Accelerated BLAST-n. No hardware or software was modified for the test.ⁱⁱ

Many SGI and Mitrionics BLAST customers have achieved significant performance improvements with SGI RASC deployments incorporating many fewer than 70 FPGAs.,

“The performance numbers from this test are very impressive. SGI deserves major credit for its advanced system architecture and RASC technology, which was able to work together so well pretty much out of the box,” stated Anders Dellson, CEO of Mitrionics, Inc. “Mitrionics is also very excited that our Mitriion Virtual Processor and Mitriion-BLAST application was able to scale across 70 FPGAs in a system, and achieve the 900x performance increase without any modifications of our code. This certainly shows significant potential as technology that supports initiatives to deploy efficient, high-performance computing.”

“SGI RASC solutions are designed to bring the benefits of FPGAs to more customers, and highly optimized bioinformatics applications such as Mitriion-BLAST are a significant part of that effort,” said Bill Brown, server product marketing manager, SGI. “The effort to build the world's largest FPGA supercomputer represents how SGI is working with innovators such as Mitriion to help organizations achieve their performance goals while managing power and space constraints in the data center.”

(MORE)



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The Mitrion-Accelerated BLAST application runs on a turnkey SGI® RASC™ RC100 blade system equipped with the latest powerful and energy-efficient FPGAs (Field Programmable Gate Arrays) from Xilinx. Leveraging the ultra-fast memory subsystem in SGI® Altix® servers and the Mitrion Virtual Processor, the accelerated NCBI BLAST application achieves performance increases from 20x to 60x faster than the non-accelerated NCBI BLAST running on a quad-core Opteron processor. The performance increase range depends on the size of the queries, with very large queries typically having the highest performance gains.

About Mitrionics

Founded in 2001, Mitrionics, Inc. is the technology leader in the exciting new field of FPGA Accelerated Computing which provides higher processing power and lower energy consumption than clusters of computer systems. The company's Mitrion Virtual Processor and Mitrion Software Development Kit provide cost effective FPGA Supercomputing power to organizations for their most critical applications. The software-centric Mitrion Platform is unique from any other FPGA programming solution, because it eliminates the need for circuit design skills, thus making FPGA Supercomputing performance accessible to an entire new market of scientists and developers. Mitrionics has key industry relationships with Cray, Nallatech, and Silicon Graphics. For more information, visit the company Web site at www.mitrionics.com, or call 408-966-8500, or email: info@mitrionics.com.

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ⁱ Results compared to industry-standard Opteron processor-based system measured in internal tests. Running a released version of BLAST, SGI used a test case from Affymetrix comparing approximately 600,000 queries with a query size of 25 base pairs against the Human Unigene and Human ReSeq databases, which is representative of current top-end research in the pharmaceutical industry. Total execution time on a traditional 68-node Opteron-based cluster would be approximately three weeks. On the SGI reconfigurable supercomputer, benchmark input data was split in 169 jobs, which were run in groups of 70, 70 and 29 FPGAs. Total wall clock time for the run was 32m:29.183s, representing a 916X speedup over the 68-node traditional cluster.

ⁱⁱ The tested SGI configuration consisted of 35 dual-FPGA SGI® RC100 RASC blades, a 64-processor SGI Altix 4700 with 256GB of globally addressable memory, and standard SUSE Linux Enterprise Server 10 SP1 (kernel version 2.6.16.46-0.12) running an unmodified release of RASCAL, SGI's RASC Abstraction Layer.