



Bielefeld University Using Convey Hybrid-core System to Accelerate Genomic Research

Richardson, Texas—July 23, 2012—Convey Computer today announced that Bielefeld University, Center for Biotechnology (CeBiTec), is using a Convey HC-1^{ex} to help researchers accelerate innovative genomic research. CeBiTec, located in Germany, provides bioinformatics researchers with data analysis algorithms, software applications, and hardware infrastructure.

“We needed to increase performance of our assembly applications without adding another rack of boxes,” explained Alexander Goesmann, head of the Bioinformatics Resource Facility at CeBiTec. “Because we were already pushing the limits of our network-attached storage, adding dozens of systems would introduce unacceptable I/O bottlenecks. We needed a different approach.”

To solve this challenge, CeBiTec integrated a Convey HC-1^{ex} into their existing cluster environment. Convey’s innovative hybrid-core architecture pairs classic Intel® processors with a coprocessor comprised of field-programmable gate arrays (FPGAs). For CeBiTec, the system provides more overall performance, without significantly increasing traffic to their file servers. In addition, specific bioinformatics applications execute much faster on the Convey than they would on a cluster of commodity systems.

The Convey GraphConstructor is an example of one such application. It accelerates construction and manipulation of de Bruijn graphs commonly used in short-read, *de novo* genome assembly applications.

“The Convey GraphConstructor allows us to do large assemblies quickly,” said Dr. Burkhard Linke, a researcher at CeBiTec. “Using the Convey system, we cut the time it takes to finish a large genome assembly from weeks to days. And because a typical genome project involves dozens of assemblies with varying parameter sets, the Convey system dramatically reduces the time we need to complete a project.”

CeBiTec has incorporated Convey’s GraphConstructor into the automated pipeline that they use for all their *de novo* assemblies. “In addition to saving us

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time, the performance increases allow us to do assemblies that weren't practical to do before," explained Linke. "GraphConstructor is the only tool able to do these assemblies in a reasonable time frame."

Convey's open architecture also makes it possible for customers to design their own custom implementations. CeBiTec is currently collaborating with the University of Paderborn within the ENHANCE project on new bioinformatics applications for read mapping and taxonomic profiling of metagenomics reads. "The possibility of doing our own implementation is something really unique in the Convey system," continued Goesmann. "We are just now exploring the system's potential in this area, and we are excited about future possibilities."

Using the Convey system, CeBiTec has extended the life of their network-attached storage, achieved dramatically faster results, and explored assemblies that were previously impractical. "The Convey HC-1^{ex} was easy to implement and has saved us quite a bit of time," concluded Goesmann. "Compared to other computing architectures, the Convey system provides us with much better price/performance for the applications we are using."

About Convey Computer Corporation

Based in Richardson, Texas, Convey Computer breaks power, performance and programmability barriers with the world's first hybrid-core computer—a system that marries the low cost and simple programming model of a commodity system with the performance of a customized hardware architecture. Using the Convey hybrid-core systems, customers worldwide in industries such as life sciences, research, big data, and the government/military enjoy order of magnitude performance increases while reducing acquisition and operating costs.

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