



Computing in the Fast Lane with Metacomp Technologies and AMD Opteron™ Processors

“High performance computing is essential for designing and supporting our Computational Fluid Dynamics and other programs, and 64-bit Dual-Core AMD Opteron™ processor-based clusters help us to reduce development time and improve turnaround for support issues. AMD’s 64-bit processor technology gives us the ability to support large computational models which demand high performance, large memory addressability, and economical space, power, and cooling requirements. In addition, HyperTransport™ technology has enabled us to link two motherboards together to create a 16-core stand-alone system with 128GB of RAM for a fast and highly efficient pre-processing system.”

-- Sukumar Chakravarthy, President, Metacomp Technologies

Challenge

- Complex, performance-intensive computational application development and support required higher-performance 64-bit processing
- Company needed the ability to scale processor cores and memory in cluster-based systems without exceeding power, space, and cooling budgets.

Solution

- Working with system integrator PSSC Labs, Metacomp Technologies upgraded to AMD Opteron™ processor-based servers in 2004, and has continued to build new, AMD-based clusters using 64-bit, dual-core technologies.

Impact

- Metacomp Technologies has cost-effectively built clusters of up to 64 cores that enable it to support even the largest and very compute-intensive customer applications with quick turnarounds, and without exceeding its power, space, and cooling capabilities.

Organizational Profile

Metacomp Technologies is a leading provider of Computational Fluid Dynamics (CFD) and other analytical software tools for major aerospace, defense, and automobile manufacturers as well as other companies that require complex modeling during research and development. Metacomp Technologies’ CFD ++ product is setting the pace in the CFD marketplace with its unique combination of accuracy, reliability and performance..

Founded in 1999 and based in Agoura Hills, California, Metacomp Technologies has built its reputation not only through market-leading software functionality, but also through the speed and quality of its customer support. Unlike some other, larger competitors, Metacomp Technologies doesn't use call centers – it supports its products with software engineers who have a deep, hands-on understanding of how to apply its products in many different testing and modeling scenarios.

Challenge

Although it has only about 20 employees, Metacomp Technologies competes with far larger companies for market share in the Computational Fluid Dynamics and Aero Acoustics modeling and analysis markets. The keys to its success have been to offer an exceptionally strong suite of tools with world-class customer support. As a software developer, Metacomp Technologies must keep one eye on the present – assisting customers with modeling problems that can take days to execute – and one eye on the future by anticipating near-term advancements in computing hardware and software architectures.

By 2003, Metacomp Technologies had begun using a server cluster to deliver the high computing performance it needed to speed software testing and verification and respond quickly to customer modeling support challenges. But the existing server cluster used 32-bit processors, and Metacomp Technologies' current processor vendor had not yet announced a 64-bit upgrade that would allow the servers to address far more memory space. Metacomp wanted to use 64-bit processors in its server cluster nodes, knowing that the new technology could improve the cluster's performance dramatically.

At the same time, Metacomp Technologies had abandoned building its own computer systems and was looking to outsource this function to a knowledgeable and reliable systems integrator that could make the right decisions about state-of-the-art computing architectures.

Solution

Metacomp Technologies selected PSSC Labs, a Southern California-based systems integrator focusing on high-performance server clusters for corporate and government clients, as its server technology supplier. PSSC Labs recommended 64-bit Dual-Core AMD Opteron™ processor-based servers with high-speed, low-latency InfiniBand interconnects and 256GB of RAM per server.

Since 2004, PSSC Labs has supplied AMD Opteron processor-based clusters to Metacomp Technologies, including 16-core, 32-core, and 64-core PowerWulf Clusters, plus PSSC Labs' Octagon 8 Way System, a unique standalone system for preprocessing that includes 8 dual-core processors and 128GB of RAM. While Metacomp Technologies has excellent relationships with all hardware and providers, Metacomp continues to rely on PSSC Labs for its in-house clusters.

Impact

The 64-bit Dual-Core AMD Opteron processor-based PowerWulf Clusters have enabled Metacomp Technologies to speed testing and verification of its own software, improve

responsiveness to customer support issues, and scale performance without exceeding its space, power, and cooling budgets.

“During development and testing, we have to run large test suites, and they can take two weeks to run. For testing the builds and running them through quality assurance, the clusters help speed up the process,” said Sukumar Chankravarthy, president of Metacomp Technologies.

At the same time, Metacomp has used the PSSC Labs PowerWulf Clusters to improve customer support. “Our customers run very complex problems that can take days to run. They are very patient because they know that these problems take time to resolve, but they appreciate the speed with which we can turn issues around and offer good advice. The server clusters allow us to offer industry-leading turnaround times,” said Chakravarthy.

Metacomp Technologies last upgraded a PowerWulf Cluster from 32 to 64 cores in March of 2007, and has now ordered an upgrade to a 96-core system. “We like to stay ahead of the performance curve so we can deliver excellent service,” said Chakravarthy. “Often, we have more computing power than many of our small clients. But at the same time, we only have so much space and power for our systems. AMD’s processors and PSSC Labs’ systems have helped us to upgrade without blowing our budgets.”

Metacomp has also stayed with AMD Opteron processor-based PowerWulf Clusters because despite performance upgrades to the processors over the past three years, the servers remain fully compatible with Metacomp Technologies’ software. “Our software runs equally well on all of the processors,” Chakravarthy said. “We can always fine-tune the cluster’s configuration for maximum efficiency, but the software runs on all of our clusters and our clients’ clusters, even when a cluster has thousands of cores.”

In addition, Metacomp has found PSSC Labs to be a consistently reliable supplier with excellent service of its own. “PSSC keeps tabs on all changes in technology so we don’t have to, including hardware, chip, interconnect and operating system developments,” said Chakravarthy.

PSSC Labs has also been creative in matching technology to specific needs within the company. For example, PSSC built its Octagon 8 Way System specifically for pre-processing (mesh generation and initial problem setup and testing) at Metacomp Technologies. This is a unique system including eight 64-bit Dual-Core AMD Opteron processors and 128GB of RAM. It uses HyperTransport™ technology to link two motherboards containing four dual-core processors each, providing full memory addressability to the 128GB of RAM. “Many large companies do not have desktop systems that are this powerful,” says Chakravarthy, “so it’s not just the clusters. AMD and PSSC Labs have enabled us to have this great standalone configuration, and the power all comes from the AMD-based motherboards and the memory addressability.”

About PSSC Labs

PSSC Labs is not just another computer company. Our commitment to customer satisfaction, careful attention to detail and focus on high performance computing differentiate us from the pack. PSSC Labs line of PowerWulf Clusters, PowerServe Servers, PowerStation Workstations and RaidStation Storage systems are custom configured for each end user's needs and budget. If you are tired of dealing with computer companies that promise the world but leave you stranded than you are ready to experience the PSSC Labs difference. Everyday more people are discovering why PSSC Labs is the right choice.

About AMD

Advanced Micro Devices (NYSE: AMD) is a leading global provider of innovative microprocessor solutions for computing, communications and consumer electronics markets. Founded in 1969, AMD is dedicated to delivering superior computing solutions based on customer needs that empower users worldwide. For more information visit www.amd.com.

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