



Company Success Stories - Cray, Inc.

AMD's Professional Design Support Service Helps Drive Record Time to Market

Profile
Cray, Inc.

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Organizational Profile:

Cray has long been regarded as a leader in supercomputing technology. In industry, Cray high-performance computers increase productivity, reduce risk and decrease time to market for companies across a range of applications in industries such as automotive, aerospace, life sciences, petroleum and financial sectors. In government, Cray's phenomenal computing power, speed and usability contribute to national security as well as other research endeavors that have tremendous economic consequences, such as weather forecasting and climate prediction. In academia, Cray systems give researchers the power to unravel profound mysteries and make breakthroughs in vital scientific research.

Cray is headquartered in Seattle, Washington with additional research and manufacturing facilities in Minnesota, Wisconsin, and British Columbia.

In February of 2004, Cray purchased privately held, start-up system builder OctigaBay Systems Corporation. Prior to the acquisition, OctigaBay had been enjoying rapidly growing interest and admiration for its recently-announced 12K high-performance computing (HPC) server, based on the AMD Opteron™ processor. Press, industry analysts, and potential customers were all drawn by the unique interconnect features of the 12K (now branded and heretofore referred to as the Cray XD1) and especially to the fact that it brought HPC-class computing to a new and much broader market because of its industry-standard components and features at a sub-\$100K price tag.

Challenge:

- Understanding the advantages offered by the AMD Opteron processor, its scalability, features, capabilities
- Understanding HyperTransport™ technology
- Managing any possible thermal issues associated with the proposed 12 processors in a single chassis
- Getting it all done quickly, elegantly and bug-free

The Cray XD1 design team had heard quite a bit of anecdotal information about AMD's planned new x86 processor that was designed to run both 32- and 64-bit applications natively and slated to launch in April of 2003. They were very intrigued by the overall processor architecture that brings the memory controller on board the processor core and features HyperTransport technology to coherently link processors to one another on a single board and to the periphery I/O system.

The design team realized that to move forward quickly, they were going to want technical support from AMD in order to most efficiently understand the design of the processor – its scalability, features and capabilities – and of HyperTransport technology. And then would come the job of translating that knowledge to the design of their brainchild, a lower-than-typical cost HPC server that focused on providing incredible throughput and application performance.

According to David Londry, working on the Cray XD1 system design, "Any high performance processor is a highly technical part and the AMD Opteron processor is no exception, especially when you are using it in a unique way as we were, and so soon after it came on the market. Add to that the fact that this was our first major design and it is obviously a bit more intricate than a single or dual processing box. We wanted and needed to know as much about this part as possible. To get it done quickly, you have to add the experts who know the technology inside and out." While it was not clear that AMD provided this type of consulting service, Londry began making some phone calls, starting with his local marketing representative in Vancouver. Thus began the quest to find the right group at AMD for help.

Solution:



The design team's ultimate solution was nearly a continent away from their offices in British Columbia. AMD's Boston Design Center, which had been established in February of 2002, takes customers like Cray and their needs very seriously. "Once we finally connected with the BDC, Peter Robinson was almost immediately on a plane to come and meet with us," said Londry.

"HyperTransport technology was one of the keys to our design – it gave us a big pathway to memory and the BDC's heritage was rooted in HyperTransport technology development, which we came to realize was a very big bonus for us," said Ron Scott, a member of the Cray XD1 hardware engineering team.

Peter Robinson, a business development manager at AMD's Boston Design Center, understood precisely what the soon-to-be Cray design engineers needed. Robinson developed an engineering services contract that would include unlimited access to AMD's reference design boards for the AMD Opteron processor, web-based issue trackers and regularly scheduled conference calls between the teams to discuss issues and next steps.

"Right from the get-go, having somebody there was a short cut – that was a speed up," said Scott. "We got quite a bit of support on how to dissipate the heat that could be associated with a 12P box."

Robinson and many of the other engineers at the Boston Design Center had worked together previously as part of API Networks, a co-developer of HyperTransport technology with AMD. "I believe our experience in helping create HyperTransport technology was a big factor in our ability to help the Cray team take full advantage of their design's I/O features," said Robinson.

According to Cray's Scott, "Peter and the rest of the Design Support team helped us understand how the architecture of the AMD Opteron processor worked, taking us beyond the documentation, and inside the processor. They provided insights into the internal operations of the processor – territory where it's typically very difficult to get answers - as many companies feel that could encroach on their intellectual property. AMD was more concerned about us having the information we needed."

Impact:

After the two companies worked closely on analyzing test results and fine-tuning, the Cray XD1 was ready for the HPC industry's critique at the November 2003 Supercomputing tradeshow.

From their own booth and a prominent spot in AMD's booth, the XD1 team took the wraps off the 5.25" high, 23" wide, and 32" deep box to the oohs and aahs of show attendees, press and industry analysts. "It was an added bonus for us that not only did we get design support for the product, but AMD was also very accommodating in supporting our marketing and PR efforts," said Londry.

For the XD1 designers, who saw their product almost immediately garner the interest of the industry heavyweight, the project also had far-reaching impact. Cray purchased the small Vancouver start up three months after the first product demonstration and has made the XD1 a core component of their product line.

"We began the schematics in May of 2003 and had a working prototype for public demonstration in mid-November of 2003. This is practically unheard of in the server market where design cycles can typically run 12-18 months," said Londry.

About AMD

AMD (NYSE:AMD) designs and produces innovative microprocessors, Flash memory devices and low-power processor solutions for the computer, communications and consumer electronics industries. AMD is dedicated to delivering standards-based, customer-focused solutions for technology users, ranging from enterprises and governments to individual consumers. For more information, visit www.amd.com.

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