

Synopsys and Agere Systems

DesignWare IP for PCI Express Reduces Time to Market by up to Six Months

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Kamran Azadet, Director of PHY Architecture and IP Development, Agere Systems

Business

Leading manufacturer of semiconductors for storage, wireless data, and public and enterprise networks

Issues

- Reach the market as quickly as possible with business critical product
- Minimize impact on engineering resources
- Select a trusted IP source that would provide quality products and service

Solution

Synopsys DesignWare® Endpoint digital controller core for PCI Express®

Benefits

- Achieved first time silicon success with full PCI-SIG compliance
- Prevented a silicon re-spin that would have cost 3-6 months time to market and up to 36 man-months of engineering
- Reached the market earlier with DesignWare PCI Express solution, allowing Agere to attain a competitive advantage

Overview

Agere Systems conceived of a concept for its re-emergence into the Ethernet market, and time to market was crucial. Rather than take the time to develop the product's key interface internally, Agere engaged with Synopsys to provide PCI Express IP from its DesignWare IP portfolio. By providing outstanding service to accompany this IP, Synopsys helped Agere achieve first silicon success, saving a silicon re-spin that would have cost up to six months. Agere is now capitalizing on its head start to rebuild its Ethernet business.

Agere Reaffirms its Internet Leadership with Leading Edge Product

Agere Systems is a global leader in semiconductors for storage, wireless data, and public and enterprise networks. The company's chips and software power a broad range of computing and communications applications from cell phones, PCs, PDAs, hard disk drives and gaming devices to the world's most sophisticated wireless and wireline networks.

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Agere targeted a product at the far leading edge of the market—a single chip solution for interfacing Ethernet with PCI Express, the new industry standard. The product, the Agere ET1310 PCI Express Gigabit Ethernet Controller, delivers functionality and performance that took several chips in the past. It combines PHY functionality, a Media Access Controller (MAC), a PC interface and memory. In tune with industry trends including the transition from Fast Ethernet to Gigabit Ethernet, the migration to PCI Express, and the emergence of 64-bit CPUs for mainstream desktop computing, the new Agere product had every opportunity to become a business success. But only if it reached the market on time.

Build or Buy? Results Show that Agere Made the Right Decision

“We faced a difficult dilemma early in the design phase, or so it seemed at the time,” says Kamran Azadet, Director of PHY Architecture and IP Development. “We could have performed all the interface development ourselves, which had the advantage of building up our competence in a core Agere technology. On the other hand, we could employ one of several third-party IP products available, which stood to save us substantial time to market. To help make our decision, we examined the IP options and found that the DesignWare PCIe Endpoint digital IP from Synopsys was clearly the one for us. In the end, the availability of a solution from such a high quality source made our choice a lot easier, and we decided to count on Synopsys to get to market as fast as possible.”

Over the course of the project, Synopsys worked closely with Agere to understand the requirements and to customize the PCIe Endpoint IP to best meet Agere's design needs. “All the work we did together not only introduced the functionality we needed for the product, but it helped us gain a better understanding of the PCI Express technology as a whole,” says Azadet. “Throughout the project Synopsys demonstrated the flexibility and willingness to do whatever it took for us to be successful.”

Saving a Silicon Spin Yields a Vital Time to Market Edge

And successful they were. The PCI Express Gigabit Ethernet Controller taped out on schedule in late 2004, and first silicon worked impressively. By early 2005 Agere was making volume deliveries to ODM manufacturers, who proceeded to incorporate the chips into products such as motherboards for sale to the OEM market.

“We got a critical head start and can leverage our performance, power consumption, and cost advantages to win business,” Azadet said.

In closing, Azadet reflects on Agere's original decision to employ Synopsys DesignWare IP for PCI Express rather than develop the interface internally. “In retrospect there's no question in my mind that we did the right thing,” he says. “I come from an intense R&D background that often leads to a bias toward internal development. However, I've become convinced that except in extreme cases, time to market is far more important than building up a particular skill set. It's right to look outside for opportunities to save time by incorporating third-party IP, especially when the developers of that IP display the competence and responsiveness that Synopsys did.”

“We set out to build a very high quality, full-featured PCI Express solution that we could bring to market quickly with full confidence that our implementation would pass the PCI Express standards compliance checklist,” he concludes. “Synopsys clearly demonstrated it was up to the task, and delivered to us even better than promised.”

The logo for Synopsys, featuring the word "SYNOPSYS" in a bold, sans-serif font with a registered trademark symbol (®) to the upper right.

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