

Synopsys and BRECIS Communications

BRECIS Communications successfully implements its new Multi-Service Processor architecture

A new class of network processors from BRECIS Communications enables cost-effective design of broadband customer premise equipment. The BRECIS Multi-Service Processor (MSP) family supports emerging multi-service applications, such as combined voice and data, with no loss in quality of service. When the BRECIS design team needed assistance with its first MSP implementation—which involved taking 12 very different subblocks to silicon as quickly as possible—they turned to Synopsys Professional Services for help with tools and methodologies.

“Synopsys surpassed our expectations. They blended in and worked as part of our startup team. Everyone put in extra effort—beyond what was asked—to make the entire team successful.”

Mr. Michael Ngo, Vice President of Silicon Engineering

network

Solution

- Synopsys Professional Services—Design Implementation Services
- DFT Compiler, TetraMax® and other tools

Benefits

- Fully functional silicon on the first tape out
- Resources to quickly assess and develop a new technology implementation flow
- “Startup mentality” consultants who exceeded expectations
- Shorter time-to-productivity and self-sufficiency for the future

Business

BRECIS Communications Inc. is developing system-engineered solutions to enable the next generation of broadband customer premise equipment. By incorporating BRECIS' solutions into their equipment, service providers and enterprises can offer new functionality to their customers. Businesses, multi-tenant dwellings, and residential consumers will gain new flexibility, security, and economy by having voice, video and data available via a network device attached to a single broadband connection.

Issues

- Shortening time-to-productivity with new tools
- Becoming self-sufficient
- Finding technical resources to achieve startup goals
- Reducing time-to-market for complex chip designs

implem

How many information lines does it take to run a business? Or connect a home? With separate phone lines, data lines, and cables, today's answer is, "a lot." But the increasing availability of broadband in metropolitan areas promises to change all that.

Instead of many different lines, with many different speeds and services, homes and businesses could rely on one fast, flexible connection for all different types of connectivity. It wouldn't matter whether that connection was fiber, or copper, or even wireless. The key is to integrate and manage all types of data—voice, data, and video—from a single, on-premises network device. The BRECIS Multi-Service Processor (MSP) makes this possible.

BRECIS has invented an entirely new network processor architecture that combines the concepts of network processing with system-on-a-chip-level

integration. According to Tore Kellgren, director of engineering (physical design), "Our first implementation of MSP architecture allows truly concurrent execution of voice and data processing on a single chip with a high level of quality, which is particularly challenging for voice."

When incorporated into customer premises equipment, these first MSPs will dramatically change how voice and data services are provided. For example, says Michael Ngo, vice president of silicon engineering, "If an enterprise has many offices around the country, MSP changes the approach to connecting them all together by bundling phone and data service together."

Currently each office would sign up for phone services (say 20 lines hooked up to PBX), and order a TI line separately. Then, to connect to another office, they would put in place an elaborate

WAN/LAN with firewalls and other security measures. With BRECIS' network processors and a high-speed broadband connection, the office could have a single line providing telephony services to all its employees, data service for its LAN, and a secure private network. Adding more phone lines or re-provisioning network bandwidth would be easy, with no new wires required.

To help make this vision a reality, BRECIS—a young startup company—asked Synopsys Professional Services to help implement its first MSP devices.

The Importance of a Startup Mentality

BRECIS faced the same challenges common to most startup companies: how to transform a brilliant idea into reality, how to bring it to market before the competition, and how to find the necessary technical

resources. Bringing in consulting expertise seemed a natural way to meet these challenges. What they expected was assistance with Physical Synthesis. In particular, the design team wanted help exploiting the full capabilities of the Synopsys Physical Compiler tool. What they got was a pleasant surprise.

Synopsys Professional Services consultants provided intense, full-time support to move 12 subblocks through the tools and

enttation

methodologies, doing anything and everything they could think of to achieve a successful tape-out. "There was no difference between a full-time employee and a Synopsys consultant," says Ngo. "We worked together really well to bring the first BRECIS product to market."

Sitting side-by-side with the BRECIS design engineers, putting in the same hours, Synopsys consultants became part of the BRECIS startup environment. They helped BRECIS:

- Develop a predictable, repeatable standard flow to be used for all blocks in the design from RTL to GDSII

- Resolve tool interface issues so that Synopsys and third/-other vendor's tools were tightly integrated in the flow
- Achieve timing closure quickly. None of the blocks needed post-route optimization
- Develop a comprehensive chip level timing analysis strategy
- Insert scan, run ATPG, and verify test vectors

Adds Kellgren, "The Synopsys consultants produced the results we needed—not just what was verbalized as what we thought we needed. They contributed significantly to the total implementation and success of the chip."

A Balance of Tools and Consulting

According to Kellgren, "It was a balance of the Synopsys tools themselves and expertise using the tools that was of significant help implementing the chip."

While impressed with the potential of the tools, particularly Physical Compiler, BRECIS lacked in-house expertise in this area.

"Going from Design Compiler" to Physical Compiler is not as simple as one might think," says Kellgren. "It actually changes the transition point from front-end design to back-end design. Historically, synthesis, taking

RTL to net list, was where you moved from front-end to back-end. Once you use Physical Compiler, the transition point blurs dramatically."

Seen in this light, the tool expertise provided by the Synopsys team represented a significant shift in design thinking—a much more complex proposition than just manipulating the tool.

Push-Button Implementation

The Synopsys consultants had expertise in actual applications and production environments. They provided BRECIS with the expertise and know-how to run

Physical Compiler in an efficient manner, and supported the integration and flow so that Physical Compiler could be integrated with a floor planning tool and a routing tools, all in a seamless integration. "This gave us essentially a push button implementation of individual blocks on a chip," says Kellgren.

Also important to BRECIS was the fact that Synopsys tools did not require elimination of other methodologies. BRECIS was able to retain current tools expertise while incrementally improving its whole process.

Joint Accomplishments

BRECIS has achieved a major business goal by announcing availability of its first MSP architecture products. Synopsys supported BRECIS at this critical juncture in the young company's development, providing essential assistance to:

- Successfully tape-out the first chip in a short timeframe
- Mitigate risks associated with a first tape-out using a new methodology and new tools
- Achieve timing closure quickly and reduce the time-to-market cycle
- Insertion and verification of test logic
- Invest in a flow and infrastructure for future designs

Conclusion

Visionary in nature, BRECIS' new MSP architecture points the way to network convergence. By enabling service providers to handle voice, data, and later video through a single broadband connection, BRECIS is helping to bring new levels of simplicity and flexibility to information sharing, whether it's a telephone conversation, file exchanges, or video on demand.

With its first implementation of MSP architecture, the MSP family of processors, BRECIS has employed a total system-engineering approach to achieve a high quality of service for integrated voice and data applications. Furthermore, says Kellgren, "BRECIS provides a system solution that is as much software as it is hardware. The MSP architecture allows scalability so the same software can be used in small and large systems."

Synopsys helped BRECIS take MSP to silicon. The Synopsys team created a unique methodology for the MSP family of processors, transferred knowledge to the BRECIS team, and put in place an infrastructure that will support aggressive time-to-market goals for the next BRECIS design. Synopsys has made it easier for BRECIS to take its vision to the next level

"As a new generation of network processor, our Multi-Service Processor is an extremely complex chip. Such chips are typically not fully functional in first silicon; yet working with the Synopsys design services team, we were able to develop and deliver a fully functional chip on first silicon—an extremely important event for a startup company such as ours."

Mr. George Alexy, President and CEO

For more information about Synopsys Professional Services, or any Synopsys products, training, or support services or visit us on the Web at www.synopsys.com.



700 East Middlefield Road, Mountain View, CA 94043 T 650 962 5000 www.synopsys.com

Synopsys, the Synopsys logo and PrimeTime are registered trademarks and Physical Compiler and Design Compiler are trademarks of Synopsys, Inc. All other products or service names mentioned herein are trademarks of their respective holders and should be treated as such. Printed in the U.S.A.

©2001 Synopsys, Inc. 8/01.TM.CPR.600 SS655