FROM THE FAWCETT

Reconfigurable Computing:
Coming of Age

By BRADLY FAWCETT ◆ Editor

This past June, Xilinx held its first Reconfigurable Computing Developer's Program Conference at a hotel in Santa Clara, not far from company headquarters. Planned to be an annual event, the conference brought together representatives from 11 of the more than 20 companies that are participants in the Developer's Program.

The Reconfigurable Computing (RC) Developer's Program was founded in mid-1995 to proactively spur commercial development of reconfigurable computing applications and products *(see* XCell *#19, page 35)*. The program is designed to aid commercial companies through technical, marketing and, in some cases, financial assistance. In this context, reconfigurable computing is loosely defined as the practice of using in-system-configurable FPGAs as computing elements to accelerate operations in general-purpose computers. In these systems, FPGAs are reconfigured during system operation to perform a variety of operations directly in hardware, off-loading the host processor and dramatically increasing system performance.

Each company attending the meeting gave a short presentation about the products it has developed or is developing. Several companies brought demonstration systems to the meeting. The conference was an ideal forum for letting representatives of the member companies interact with Xilinx R&D personnel and each other.

The conference provided some valuable insights into the nature of the nascent but growing market for RC-based products. Among this small sampling, there were *two main business models*. Some companies specialize *in providing hardware and software tools to OEM accounts* that develop their own products, while other member companies are *focused on their own specific end applications*.

The first category includes Annapolis Micro Systems (Annapolis, MD), Virtual Computer Corp. (Reseda, CA), and Giga Operations (Berkeley, CA). All are making significant strides in the development of RC-based hardware platforms and software tools. One of the most interesting aspects of their presentations was the mention of the types of large corporate OEM accounts that are using or evaluating those products — names like Boeing, Ericsson, Loral, NTT, Delco, E-Systems and TRW.

Other companies are using RC-based systems in their end products to tackle a wide variety of high-performance computing tasks, ranging from satellite communications to automated searches of DNA sequences to 3-D graphic rendering for video games.

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Products that have already reached the marketplace include *Digital Wings for Audio* from Metalithic Systems (Sausalito, CA), satellite ground station communications systems from TSI Telsys (Columbia, MD), the *DeCypher II* 'Genetics Supercomputing PC' from Time Logic (Incline Village, NV), and the *X-CIM* line of DSP acceleration modules from MiroTech Microsystems (Saint Laurent, Quebec, Canada).

• Available soon in retail music equipment stores, *Digital Wings* is a 128-track audio authoring system that operates in the Windows environment on a PC (*see*). Metalithic Systems

is targeting the 'music enthusiasts' market with this product, and is developing a lower-cost version for the consumer market.

• TSI Telsys recently sold several of its satellite 'gateway' systems to NASA's Marshall Space Flight Center, where it will support programs such as the Space Station project.

• Time Logic's *DeCypher II* system, designed for screening DNA sequence data, is proving popular with both pharmaceutical companies and medical research facilities, where it outperforms multi-million-dollar supercomputers.

• MiroTech Microsystems is addressing the FPGA-based DSP market. Its DSP acceleration modules are fully

compliant with Texas Instrument Modules (TIM) specifications and are supported by a library of common DSP functions. MiroTech has signed an OEM agreement with a major manufacturer of DSP boards.

The remaining companies at the conference previewed products in development. enVia Inc. (Menlo Park, CA) is developing consumer telecommunications equipment that uses reconfigurable FPGAs to address the growing problem of incompatible wireless telecommunications standards. Octree Corp. (Cupertino, CA) has implemented 3D volume rendering systems on Annapolis Micro Systems and Giga Operations platforms, and is developing products for both medical equipment and video game manufacturers. Start-up Adaptive CAD Technologies (Sunnyvale, CA) and consulting firm Memec Design Services (Garden Valley, CA) also attended, and are applying RC technology in some new application areas (but it's too early to reveal them).

Another encouraging sign was the presence of representatives from several of the CAE companies in the Xilinx Alliance Program. The enormous potential of reconfigurable computing is beginning

to attract the attention of the CAE tool vendors. For many of these vendors, this conference was their first chance to talk with the early adopters of reconfigurable computing technology; it is certainly not inconceivable that some cooperative product development efforts will eventually result from this meeting.

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In summary, reconfigurable computing technology is continuing to 'come of age,' with several companies already garnering revenue from a wide variety of RC-based products, penetration of RC technology into large, well-known electronic equipment manufacturers, and the attention of leading design tool vendors. I'm already looking forward to next year's conference. ◆

Sharp-eyed readers may notice a slight change to the format of *XCell* in this issue. The tables listing component availability, Xilinx software status, Alliance partner information, and device programmer status have been moved from the "General Information" section to the last few pages of the newsletter. As a few readers have suggested, this will make the tables easier to find as well as providing for better continuity for those who read the whole journal front-to-back.

We are always interested in reader feedback. This issue includes a short reader survey on page 47. We would greatly appreciate if you would take a few minutes to fill out this questionnaire and mail or FAX it back to us. Alternatively, you can send your comments directly to me via E-mail at brad.fawcett@xilinx.com. We're looking forward to hearing from you. ◆