Next-Generation CPUs to Debut at Forum

Superscalar Processors Move to New Heights

by Michael Slater

The release of the program for the Microprocessor Forum this fall gives a first glimpse of what the high-performance microprocessor landscape will look like in 1995. New devices in the x86, embedded, and general-purpose RISC categories will raise performance to new levels with aggressive superscalar designs.

x86 Battle Intensifies

Intel already is facing its first Pentium-class competitor, NexGen's Nx586. David Epstein, NexGen's VP of Engineering, will show how NexGen's chip translates x86 instructions to its internal RISC instruction set.

By the end of this year, AMD is due to sample its Pentium competitor, code-named K5. Mike Johnson, AMD director and Senior Fellow, who led the chip's design, will give the first detailed description of the K5 micro-architecture at the Forum.

Intel's OverDrive chips will make Pentium technology available as an upgrade for existing systems. Mike Fister, general manager of Intel's End User Components Division, will unveil the design of the chip known as P24T, the Pentium-based upgrade for 486 systems.

RISC Performance Advances

Next-generation implementations of four of the five leading RISC architectures will appear at the Forum:

- Chin-Cheng Kau from IBM and Brad Beavers from Motorola, two of the technical leaders who created the chip, will unveil the newest PowerPC processor.
- MIPS Technologies' T5 manager, John Brennan, will reveal the microarchitecture of the first single-chip, superscalar MIPS processor.
- Paul Rubinfeld, consulting engineer and project manager for the chip, will describe the second-generation implementation of Alpha, which promises to extend that architecture's performance lead.
- Anant Agrawal, VP of Engineering at Sun, will unveil the design of UltraSPARC, the chip that Sun expects to put the company back in the performance race.

Embedded Processors Proliferate

A record number of high-performance embedded processors will debut at this year's Forum. Intel's Elliot Garbus will unveil the next-generation superscalar 960 processor, code-named P110. AMD's Mike Johnson, who continues to oversee 29000 developments while working on high-end x86 chips, will reveal the long-awaited superscalar implementation of the 29000, setting the stage for a continuing performance battle with Intel's 960.

The PowerPC architecture is this year's most important newcomer to the embedded processor arena. John Vaglica from Motorola and John McKeeman from IBM will each describe their company's approaches to PowerPC chips for embedded applications.

Motorola architect Joe Circello will unveil a derivative of the 68000 architecture and its first implementation, a chip that Motorola calls the Advanced Consumer Electronics Processor.

National Semiconductor has created an entirely new architecture for embedded processors, aiming to combine the best features of RISC and CISC architectures. Gideon Intrater will reveal the first chips that implement this architecture. Fujitsu continues to extend its SPARClite family, and Engineering Manager Srihari Kotcherlakota will reveal the latest addition. Finally, Mike Muller from ARM will unveil the ARM7500, the first highly integrated ARM processor to enable single-chip handheld computing devices.

The Future of Microprocessors

The Forum also includes several panel sessions, providing insight into three key topics:

- Set-top boxes as an emerging processor application.
- Emulation and translation technologies for enabling transitions from one architecture to another.
- Multiprocessor RISC chips vs. second-generation VLIW as the key to extending microprocessor performance into the next decade—plus a view of the role of programmable logic in accelerating computation.

As the sponsor, we're surely biased, but we sincerely believe this is one event you won't want to miss. ◆