Digital and Samsung Up the Alpha Ante... Yet Again

The first two weeks of February was a busy time indeed for the Alpha architecture. While the trade press continued to question the future of the fastest processor on the planet, Digital announced the third-generation Alpha 21264 "EV6" CPU at a higher-than-anticipated clock rate, then followed up a week later with an Alpha architecture licensing pact with Samsung Semiconductor. Here's a look at what's new on the Alpha front.

A Day Late, But Not a SPECint Short

Digital Semiconductor on February 2 formally disclosed speeds-and-feeds details on the Alpha 21264 EV6 microprocessor. Since the chip will not ship in volume for about three more months, the unveiling qualifies as a program announcement rather than an actual product launch. Nevertheless, Digital surprised some observers by publishing performance estimates that reflect an initial chip speed of 600MHz, somewhat higher than was expected. At 600MHz, the firm estimates that the 21264 will deliver 40SPECint95 and 60SPECfp95, more than enough to reassert Alpha's bragging rights as the performance leader. What's more, DEC took the unusual step of claiming that EV6 will break the 1GHz speed barrier by the year 2000, at which point the chip is expected to deliver over 100SPECint95 and 150SPECfp95. (Current performance estimates for IA64 are in the 60SPECint range). Finally, DEC claimed that the 21264 family will deliver "up to five times the highest performance of any architecture available now and in the near future." Whether the firm can make good on this promise remains to be seen, but the prospect of a ~100SPECint95 Alpha debuting soon after the much-vaunted IA64 takes a bow bodes well for the "sustainable performance advantage" —and perhaps the longevity—of DEC's RISC architecture.

Ready for Prime Time?

While some EV6-based seed systems already are at field test sites, DEC officials confirm that "the last few glitches" are being worked out of the Pass 2 silicon. Street-ready Pass 3 EV6 parts are expected to ship in the May or June timeframe. *SKD* anticipates that the chips initially will be used in high-end AlphaServer systems and upgrades. It's also likely that DEC will debut an EV6-based workstation, but it probably will be at least six to nine months before the chip materializes in midrange AlphaServers.

Damage Control, Continued

Statements made by VP Jesse Lipcon and DEC Senior Consultant John Loether at the Business Partner Executive Conference underscore the fact that the Intel settlement was a PR nightmare of the first order for Digital and its oft-maligned 64-bit RISC chip. For a variety of reasons, some folks still don't get it: DEC—and soon, via acquisition, Compaq—owns the Alpha architecture, *not* Andy Grove. According to Lipcon, the Intel settlement actually accelerates the Alpha roadmap by more than a year: Intel will begin producing Alpha chips on the same CMOS8 process in which it will produce IA64 in late 1999. Had Digital stayed the course with its Hudson plant, the firm would not have migrated to CMOS8 until 2001 at the earliest. As shown in the "Post-Intel Settlement" Alpha roadmap, DEC will move rapidly to CMOS7, and equally rapidly to CMOS8. The EV6 architecture will undergo two shrinks, first to CMOS7, then to CMOS8. The rationale for producing EV6-based parts concurrently with EV7 and EV8 is that CMOS8 and EV8 represent a new process—Intel's—as well as a redesign of the Alpha architecture. Prudence dictates that DEC test out the CMOS8 process with an existing, proven chip design rather than the EV8, which will feature symmetric multithreading and will impose significant new demands on Digital's OSes and compiler suite.

An Asian Assist

Mitsubishi Electric, which has held second-source status since Alpha was announced in 1992, recently decided to suspend manufacture of Alpha chips. But a more recent partner, Samsung Semiconductor, is jumping in with both feet. On February 9, DEC and Samsung announced an Alpha licensing agreement which grants Samsung access to all Alpha intellectual property, including all current and future chip design patents. The deal also allows Samsung to design and produce its own versions of Alpha "for specific markets," providing that the firm maintains binary compatibility with Digital parts. Although not spelled out in the licensing agreement, DEC officials maintain that Samsung will take over the management of the two dozen OEMS who currently produce Alpha clones.

Samsung is likely to beat Digital to the punch with CMOS7-based Alpha parts. Despite the firm's initial focus on 21164PC "econochips," Samsung is now focusing on bringing high-end Alpha CPUs to the mainstream. In less than a year, Samsung could be producing EV67 systems that deliver 55 SPECint95 and 75SPECfp95 for under $5K. The ramifications of the Samsung agreement are significant indeed. We'll revisit this issue in an upcoming *SKD*. In the meantime, don't count Alpha out! ■

Alpha Microprocessor Roadmap, Post-Intel Settlement

Process	CMOS6	CMOS7	CMOS8
Year	1998	1999	2000
Chip Name	EV56,EV6	EV67, EV7	EV68, EV78, EV8
Feature Size	0.35	0.25	0.18
Transistors	15M	40M	100M
Speed in MHz	600-900	750-1000	1000-1800
SPECint/SPECfp (est)	~40/60	~100/160	~200/300