Alpha Roadmap Gets Clearer

According to long-time Alpha watcher Terry Shannon and other sources, Compaq is moving forward aggressively with its Alpha processor plans. The company is preparing to deploy, in 3Q99, the first systems with a 0.25-micron version of the 21264 processor, code-named EV67. Although most processor vendors moved to 0.25-micron manufacturing more than a year ago, all current Alpha processors continue to be built in a 0.35-micron process.

The initial 0.25-micron 21264 should reach 700 MHz, with 800-MHz parts shipping in Compaq systems by the end of the year, running Digital Unix, Windows NT, and Linux. We estimate the 700-MHz 21264 will be rated at 32 SPECint95 (base) and 60 SPECfp95 (base), edging ahead of HP's 440-MHz PA-8500 as the fastest workstation CPU.

This clock-speed increase is not as large as one might expect from a full process shrink, as the 0.35-micron parts operate at nearly 600 MHz. But these parts use an older Digital process that is highly optimized for speed, not yield; future Alpha parts will use more standard processes from Intel and Samsung, limiting the speedup to about 25%, instead of the more typical 50%.

The next step will be to move the 21264 to a state-of-the-art 0.18-micron process. This chip is scheduled to appear in Compaq systems in 1Q00, initially at a clock speed of 1.0 GHz. In time, however, speeds of 1.1, or even 1.2, GHz should be possible with the more advanced process. At 1.0 GHz, the 21264 should deliver about 50 int/85 fp.

Following the 0.18-micron 21264, code-named EV68, is the 21364, or EV7. As reported earlier (see MPR 10/26/98, p. 12), this part will combine the 21264 core with a new system interface. Initially slated for 60 int/100 fp at 1.0 GHz, it too could achieve slightly higher clock speeds when it reaches production in late 2000 or early 2001.

The development of EV8, also known as Araña, is well along. This new processor is rumored to include a multithreaded CPU core, which increases parallelism by executing several routines at once. We expect EV8 to ship in systems no sooner than 2002. Stressing its long-term commitment to the Alpha architecture, Compaq claims that work on EV9 and EV10 is already under way. Sources indicate, however, that Compaq has killed an even more aggressive eight-CPU chip proposed by WRL, the old Digital Western Research Lab.

In the performance race, Alpha is clearly the architecture to beat for the next few years. The only processor likely to surpass Alpha's performance is McKinley, Intel's second-generation IA-64 chip. With a multithreaded design, EV8 could be a strong competitor for McKinley, but the Alpha effort appears to be 6–12 months behind Intel's chip. As long as Compaq's new CEO is willing to fund it, Alpha looks like a good bet to meet or exceed the performance of its competition for years to come. —*L.G.*

Celeron Hits 466 MHz

Refusing to ease up on the competition, Intel announced a 466-MHz version of its Celeron processor in conjunction with its new 810 chip set (see MPR 5/10/99, p. 17). The Celeron line (see MPR 1/25/99, p. 18) now contains five speed grades, ranging from the $67 Celeron-333 to the new part at $169. In both performance and clock speed, the Celeron-466 matches up well against the recently announced 475-MHz K6-2 (see MPR 4/19/99, p. 4). AMD will clearly need to cut the price of its part from its current $213 tag.

Intel continues to live dangerously by rapidly ramping the speed of its budget processors. In Intel's entire product line, only the Pentium III-500, with its impressive $637 list price, operates at a higher clock speed than the Celeron-466. The Pentium II-350 and -400 exist on the price list only for the thought-impaired, and at $396 the Pentium II-450 offers questionable price/performance compared with the new Celeron.

Intel reported no drop in average selling price during 1Q99 (see MPR 5/10/99, p. 23) despite the overlap between Celeron and Pentium II. The company hopes its luck holds in the second quarter. In 2H99, we expect a bigger gap to emerge, with Celeron topping out around 500 MHz, Pentium II disappearing, and Pentium III accelerating to 667 MHz as it moves to Intel's 0.18-micron process. This repositioning will help Intel maximize its profitability during the critical back-to-school and year-end selling seasons. —*L.G.*

Cyrix M II Reaches Intel Low End

Taking advantage of yield improvements at National's new Maine fab, Cyrix quietly rolled out a PR366 version of its M II processor. Freed from its dependence on IBM, the company is seeing good yields from its new fab, enabling the higher clock speed. The new CPU runs at 250 MHz and uses a 100-MHz bus, but Cyrix sells the part on the basis of a self-assigned performance rating of 366.

This speed bump was the first for the M II in nearly a year (see MPR 6/1/98, p. 4), leaving the part well behind the competition in performance. Even with the boost, the M II line barely overlaps Intel's Celeron family, as the M II-366 delivers about the same performance as a Celeron-333. The new M II carries a list price of $60, a bit less than the $62 K6-2/333 and the $67 Celeron-333.

The announcement emphasizes the stratification of the x86 processor market. While Intel and AMD go head-to-head in the mainstream market, Cyrix's brand-new, most expensive processor costs less than the least expensive processor from either of its more popular rivals. (IDT, in turn, offers products only at prices lower than Cyrix's lowest list price.) Until Cyrix can deploy new designs later this year, it will be unable to generate much profit from its PC processor line. —*L.G.*