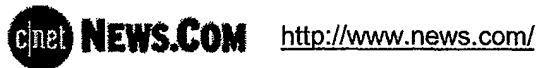


28



## Is Merced doomed?

By Michael Kanellos

[http://news.com.com/Is+Merced+doomed/2100-1001\\_3-214154.html](http://news.com.com/Is+Merced+doomed/2100-1001_3-214154.html)

Story last modified Wed Jan 02 16:43:56 PST 2002

Touted as a major milestone for Intel and the computer industry in general, Merced, the company's first 64-bit chip, appears to be losing its luster because of delays, performance issues, and upstaging by other processor manufacturers.

Industry experts have called into question the wide-ranging commercial rollout of Merced, which has been pushed back from late 1999 to mid-2000. Instead, it now appears that the chip which will propel Intel deep into the 64-bit computing arena will be McKinley, a Merced successor that's touted as having "twice the performance" and likely to come out in 2001.

In addition to bearing the 64-bit flag, McKinley could well become the first Intel chip to use copper technology, according to sources familiar with Intel's plans. Copper, which conducts better than the aluminum circuits found in current chips, is expected to lead to faster processors.

In development for more than four years, Merced is Intel's initial attempt to enter the lucrative market for 64-bit chips, which control the powerful "back-end" servers used as control centers for banks, airports, and other computing-intensive enterprises. Gaining a foothold in this market will not only raise Intel's per chip profit margins, but may also insulate the company from the decline in 32-bit PC processors, observers have said.

But that foothold increasingly looks hard to come by.

"If Merced slips another couple of quarters...this could lead Intel to not market Merced as a product but use it only as a development vehicle," said Linley Gwennap, publisher of *Microprocessor Report*, writing in the most recent issue of the respected industry newsletter.

"Sources indicate that [Merced]...is facing problems that could jeopardize [its] existence as a viable product," he wrote. "Even if that chip is compromised, however, IA-64 [the name of the 64-bit platform] itself is likely to prosper."

Intel stands firmly behind Merced. "We have unprecedented computer vendor and OS vendor support for Merced. There are considerable product plans for Merced, the product," said Bill Miller, an Intel spokesman. Judgment is also premature, he said, because only a limited number of details about the chip have been released to outsiders.

Questions surrounding Merced's commercial appeal arise in part because the delayed launch puts it so close to McKinley. In May of this year the chipmaker said that Merced's launch would be postponed due to its complexity.

Previous statements from Intel executives can also be seen as encouraging computer vendors to wait. At a 1997 chip conference, for instance, Fred Pollack, Intel fellow and director of measurement, architecture, and planning, commented that McKinley will "blow your socks off."

"There's no question that more and more lately we're hearing the mantra 'Wait for McKinley,'" said Keith Diefendorff, editor in chief of *Microprocessor Report*.

### Intel and 64-bit computing

Handles data more efficiently, in 64-bit chunks instead of 32-bit pieces.

Expected to spawn new 64-bit operating system from Microsoft. Also, will make Intel competitor in the Unix operating system market.

Raises Intel and PC vendors into the highest tiers of the corporate computing market: banks, airports, credit card companies, and other large-scale computing enterprises.

Allows Intel and computer vendors to boost profit margins, since many of these sophisticated computers typically go for well over \$10,000.

Merced is expected to debut at a speed of 800 MHz—compared to today's 400-MHz chips—and be capable of processing six to eight instructions per every "tick" of the chip's clock cycle. That would constitute an architectural improvement over current and competing chips, according to the report authored by Gwennap.

Merced will also use an advanced manufacturing process referred to as 0.18-micron. The measurement describes the circuit line width of a processor. Current Intel chips are made according to the 0.25-micron process. The smaller the micron measurement, the more powerful the chip.

Despite these impressive gains, Gwennap points out that they would be considered more impressive if the chip came out in late 1999, as originally planned. By mid-2000, Merced's performance will rank it equally with other cutting edge RISC chips.

Although quite different from Merced in some respects, the 21264 Alpha chip from Compaq Computer will likely be available at clock speeds greater than Merced. Compaq is sinking considerable resources into Alpha and touting it as a highly viable 64-bit technology—especially because it is already on the market.

IBM and Sun Microsystems have made similar predictions about speed gains for their own chips. IBM will release chips made on copper processes later this year as well as a 1-GHz chip for commercial consumption by late 1999, said an IBM spokesman. IBM will also begin to move below the 0.18-micron manufacturing process in 2000.

Big Blue—the other large, long-standing U.S. chipmaker—has been stealing the technology march on Intel over the past few months. This week the company announced a breakthrough called SOI which should yield faster chips. And in October of 1997, Big Blue was the first to announce its intention to use copper. Several other chipmakers have followed.

"I'm not convinced [Merced] will run faster than an equally fast RISC [Reduced Instruction Set Computing] chip," said Diefendorff. "I've not seen enough architectural cleverness to say superscalar RISC is dead." RISC is a chip architecture employed in Sun's Sparc design, IBM's PowerPC chip, and HP's PA-RISC processors.

Intel's Miller countered by stating the company has a well-known history of designing and manufacturing chips. "We have an excellent track record for producing the high-performance chips in volume," he asserted.

The implication: Competitors too may find delays or roadblocks on the road to 1-GHz glory.

With McKinley, Intel expects to boost performance significantly. While the chip will share the basic IA-64 architecture with Merced, two fundamental changes will be apparent in its design. First, the chip will in all likelihood be made on the even more efficient 0.13-micron manufacturing process. Second, if McKinley comes out on the more advanced process, it will use the copper interconnect technology instead of aluminum.

Diefendorff, among others, said that McKinley's 2001 release will roughly coincide with Intel's adoption of the 0.13-micron process. Intel spokesman Howard High stated that the company will only use copper technology with this process: Aluminum will not be used on 0.13-micron-generation chips. A Merced successor, he admitted, can be

expected roughly around the time this manufacturing technology comes out, and therefore will "likely" be made using the 0.13-micron process.

Other sources said that there is no guarantee that McKinley will debut on the process, but that the calendar could create the opportunity.

Until then, Merced, and what to do with it, will be an issue. Speaking on a purely speculative basis, Diefendorff said that one of the problems in developing a "new" architecture for Merced and McKinley may have come as a result of how Intel organizes its design efforts. Intel typically takes a top-down approach to chip design, hiring fleets of designers once a basic strategy is outlined. Merced seems to have been no different, with employees inside of Intel stating that a number of engineers came to the project.

"They do deploy an unusually large number of people compared to anyone else in the industry," he said. Smaller is often better, he opined, before adding that "They [Intel] have done a lot of chips. You can't argue with their methodology."

One factor that may help is Hewlett-Packard's role in developing McKinley. HP has greater experience in designing high-end computer systems and processors, and sources close to the company said earlier that it is participating more than in the Merced project.

Gwennap's report predicts that the IA-64 platform will probably be a commercial success. A number of workstation and server vendors have already put into motion business and product plans around the platform, he noted.

On the other hand, application availability could hamper Merced adoption, according to a workstation report from the Aberdeen group. "While Intel has in place a large program to get 64-bit technical applications ready at the IA-64 announcement, hardware suppliers continually tell Aberdeen that there is likely to be a lack of 64-bit applications at that introduction," the report states.

Aberdeen predicts Merced workstation units will reach 350,000 at most in the first year after the chip's release. Overall workstation sales for the same time will come to over 2 million.

"Second-generation Merced seems to be Intel's best bet for entering the world of 64-bit, high-end technical computing in volume," said Jay Moore, senior Aberdeen analyst. "Inevitably, though, it happen."

Ironically, Intel's recently released Xeon line of Pentium II chips for workstations and servers could also hinder Merced. Xeon chips are expected to hit 700 MHz by late 1999, according to MicroDesign Resources, and will be made with the 0.18-micron process. The chips are based around the familiar 32-bit Pentium II architecture, however, making it a safer bet for computer makers.

"If the performance is similar to Merced, there isn't the incentive to push to the new architecture," noted Kelly Spang, processor analyst with Technology Business Research. Instead, computer vendors may say, "Let's squeeze more profit out of Xeon."

A third factor will be the Year 2000 problem and the timing of the release of Windows NT 5.0, said Ashok Kumar, technology analyst with Piper Jaffray. Merced will be coming out at a time when corporations will likely be grappling with their Year 2000 problems and before the real migration to high-end corporate use of NT. The incentive to consider an IA-64 chip really won't come until 2001, when McKinley comes out.

Despite these complications, Dean McCarron, principal at Mercury Research, does not see long-term obstacles to the proliferation of Intel's 64-bit architecture.

"In reality, no one is moving away," he said.

Intel is an investor in CNET: The Computer Network.

Copyright ©1995-2006 CNET Networks, Inc. All rights reserved.