

# RISC on the Desktop: Game Over

## *Sun the Only Holdout in IA-64 Sweep*



With Digital's commitment to build a full range of systems based on IA-64 processors, Intel's new architecture—though still a paper tiger—has nearly completed its sweep of the computer industry. Unless Intel blunders in some major way, it seems inevitable that its microprocessor

dominance will gradually be extended to include workstations and servers as well as PCs.

The list of companies signed up to build IA-64 systems is impressive. HP, of course, has been on board from the beginning. Silicon Graphics revealed two months ago that it would build Intel-based systems, though it has refrained from publicly committing to IA-64 specifically. The three largest PC makers—Compaq, Dell, and IBM, which stated its commitment to the architecture at last month's Microprocessor Forum—are all aboard the IA-64 train. So are Bull, NCR, Sequent, Stratus, Hitachi, NEC, Unisys, and ICL.

Many of these companies have existing Intel-based product lines, and some of them have RISC lines as well. One could argue that these companies are just continuing the evolution of their Intel lines, and that this does not necessarily affect the RISC-based products. But an x86 product line and a RISC product line have clearly distinct performance positions. With IA-64 systems, the performance gap will be much smaller and, in time, the IA-64 systems probably will pull into the lead.

A very high-end focus is the only apparent survival strategy for the RISCs: build something that doesn't overlap with anything Intel builds. But in time, the space above the fastest IA-64 processors may become very small.

RISC-based systems won't disappear instantly. The RISC systems have unique software and customer bases that will take time to migrate. In addition, it probably won't be until the second-generation IA-64 processor ships in 2001 that the architecture will really shine. It will take time for the compilers and operating systems to mature, as well as for applications to get ported. But eventually, unless there turns out to be a fundamental flaw in the IA-64 approach, the architecture is likely to develop the same kind of momentum that drove the x86 architecture to dominance.

Despite many years of campaigning, none of the RISCs has large customers beyond the architecture owner (except for embedded applications). None has a customer base that approaches the weight of the companies signed up for IA-64.

Digital executives claim that the company's plans for Alpha remain unchanged, and that they still hope to drive it

into the mainstream PC market (see MPR 11/17/97, p. 1)—but this just doesn't seem realistic. Alpha has made little headway against x86, and it will have a lot more difficulty making headway against x86 and IA-64. The publicity surrounding the Intel/Digital deal has been damaging, and Digital's Alpha customers must be very skeptical. Digital's system business will find itself increasingly torn between Alpha and IA-64.

Silicon Graphics plans to stick with MIPS for its high-end systems but has no expectations of driving it into lower-cost desktops. The current turmoil at SGI could lead to an acceleration of its move to Intel-based systems.

Sun is the last IA-64 holdout among major computer companies. Sun's strategy is anti-Intel, anti-Microsoft: SPARC, Unix, and Java. When I asked whether Sun would build IA-64 systems, Scott McNealy unambiguously replied, "absolutely not." But Sun has committed to porting Solaris to IA-64, making it easy to switch when the time is right. I'd expect McNealy to deny that Sun has any plans to build IA-64 systems right up to the day Sun announces them.

In the old days of the computer business, companies were vertically integrated and competed in all levels of technology. The PC business established a different model, in which a few technology suppliers feed hundreds of computer companies, which differentiate through system design, peripherals, packaging, marketing, distribution, and support. While there won't be one product, as with the IBM PC, that establishes IA-64's role, the number of companies supporting it—and the resources Intel can put behind it—are likely to create a critical mass that no RISC architecture has been able to achieve.

IA-64 clearly has the potential to have a chilling effect on competition in high-end microprocessors. It may or may not be a real breakthrough—but it doesn't have to be. It just has to be pretty good. The danger that progress will slow, and that Intel won't price as aggressively, in the absence of vibrant competition is real—but the price of the free-market system is that strong companies may get stronger. The industry must depend on the Department of Justice to make sure that Intel plays by the rules.

Innovation in computers will continue, but its focus will shift from instruction-set architecture and microprocessor design to delivering system-level solutions. Companies that want to compete in the microprocessor industry have two realistic approaches: focus on embedded applications, or build processors that are software-compatible with Intel's. □

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