

# MIPS to Fade Away on Desktop

*Silicon Graphics to Build Intel-Based NT Workstations; IA-64 Systems Likely*



Foreshadowing the end of MIPS as a desktop architecture, Silicon Graphics recently disclosed that it is developing a line of Intel-based systems running Windows NT, to ship no sooner than the second half of 1998. Company executives refused to provide any other details or to comment on whether SGI would build systems using Pentium II, Merced, or other IA-64 processors.

For most workstation companies, such an announcement would be mundane. But for SGI, it carries special significance. SGI is not only the owner of the MIPS architecture but also its prime customer in general-purpose computers. The MIPS architecture was once at the heart of many computer companies' product lines, but SGI is the only one left that has MIPS at the center of its strategy.

It wasn't very long ago that SGI had a religious devotion to MIPS and Unix. Its attachment to MIPS was sufficiently great to drive it to acquire MIPS Computer Systems when that company fell on hard times. And its devotion to Unix was so strong it scorned Windows NT even when MIPS was the only non-x86 architecture supported by NT.

What has changed? According to SGI executives, the company is focused on being the number-one supplier of technical workstations, and it will do whatever it must to attain this position. The obvious implication is that it needs Windows NT, and Intel microprocessors, to achieve this.

MIPS microprocessors just haven't delivered their hoped-for price/performance advantages. The R10000 offers superior floating-point performance, but at a high cost—and its integer performance is nothing exceptional. The next-generation "Beast" program was canceled when simulations projected lackluster performance, and the R12000 (see *MPR 10/6/97, p. 1*) is an unexciting alternative. Systems based on these processors have been too expensive, in any case, to reach into the higher-volume market SGI began tapping with its entry-level O2 line and now plans to serve with Intel-based systems.

Sources indicate SGI plans to start with a future Pentium II processor—perhaps Katmai, a 2H98 version of Pentium II that we expect to include dual-issue FP to accelerate 3D geometry. This may be a stepping stone, but Merced and future IA-64 processors are probably the destination.

SGI executives say there are no plans to de-emphasize MIPS processors in other parts of the product line, and that this is an additive, not a replacement, strategy. I wouldn't be surprised if the SGI executives really believe this. But I think reality will turn out differently.

If Merced and successive IA-64 processors perform as well as their potential suggests, I expect more and more of SGI's product line will gradually, but inevitably, move from MIPS to IA-64. How many users will choose a MIPS/Unix system over another SGI system that offers better performance at the same price, as well as compatibility with PC software and NT workstation applications? Note that with IA-64, Intel's long-standing handicap in floating-point performance will be gone.

SGI argues that continuing to develop processors is not especially expensive—less than 2% of the company's \$3.7 billion revenue—and that it can achieve performance advantages it won't get from using Intel's processors. Its own processors benefit from the company's deep knowledge of high-performance system design; they are designed for different workloads than Intel's processors have been; and the company is willing to spend more money in pursuit of high bandwidth and high floating-point performance.

With IA-64, however, I expect Intel will follow a strategy it has never pursued before: building high-end chips that aren't designed to quickly reach PC price points. It must do this for its partner Hewlett-Packard to be successful. And it must do this to significantly extend its role in the workstation and server markets. This approach will make it much harder for MIPS processors to deliver a significant benefit relative to Intel's fastest chips.

Although SGI's Intel-based systems will start at the low end of its line, the midrange desktop business is likely to convert within a few years. The only real question is how long MIPS will hold on to the servers and high-end desktops.

The MIPS architecture is thriving in the embedded market, and there is no reason for a desktop shift to affect its success there. But conversely, little of that success translates into a benefit in desktop systems. SGI notes that the high volume achieved by the embedded chips gives SGI close foundry relationships. This is indeed a nice side benefit, and it may be an important factor in making it feasible for SGI to continue developing its own high-end processors. But it doesn't justify that strategy if the end products don't demand it. Dropping the high-end MIPS processors wouldn't diminish the architecture's viability in the embedded market.

SGI's plan to use NT and Intel processors shows a flexibility that may be essential to the company's future success. Taken to its logical conclusion, however, this strategy suggests an ever-shrinking role for MIPS on the desktop. ▣

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