

THE EDITORS' VIEW

HP Twiddles While PA-RISC Burns

Company Lags Other RISC Vendors in Opening Architecture

Hewlett-Packard is currently prospering due to a decision in the late '80s to shift all of its computer systems to RISC, overtaking the proprietary CISC systems of IBM and DEC. Now, these companies and others have not only shifted to RISC but are opening their architectures to increase volume. HP has dawdled in this regard, leaving its PA-RISC architecture in a precarious position with poor long-term viability.

A truly open architecture has a large number of vendors selling differentiated products based on that architecture. The x86 architecture is the archetypical example, with multiple processor vendors and a huge number of system vendors. By this standard, MIPS and SPARC are the most open of the RISC architectures. PowerPC and Alpha have yet to demonstrate multi-vendor system shipments, but both are making the right moves to establish themselves.

The first step in opening a processor architecture is merchant-market availability, preferably from multiple sources. SPARC, MIPS, x86 (despite Intel's objections), and PowerPC all have multiple sources, and Mitsubishi says it will second-source Alpha processors by late next year. HP has yet to make its PA-RISC chips available on the open market. Three years after licensing HP's architecture, Hitachi will finally unveil a 120-MHz PA-RISC processor this month, but this chip is not aimed at the low-cost, high-volume market, making it unlikely to spur a wave of PA-RISC clones.

A speedy processor will not be considered by most high-volume system vendors unless compatible system logic is available. MIPS, Digital, and Motorola (*see 071002.PDF*) are developing chip sets that connect their CPUs to popular PC buses. To use a PA-RISC processor, in contrast, each system vendor must design its own memory controller and bus interfaces, a daunting and expensive task for all but the largest companies.

Finally, to attract system vendors, popular software must be available. MIPS, Alpha, and x86 support Windows NT; SPARC will by 1995 (*see 0710MSB.PDF*), and PowerPC is rumored to be following suit. PowerPC will also support Macintosh software.

HP, on the other hand, has careened from its own HP-UX to OSF, back to HP-UX, and now into COSE, trying to salvage something from its UNIX background. The company's only alternative is the NextStep operating system, which is not likely to bring many third-party vendors banging on the door. HP's Windows NT effort has been paralyzed by indecision; by the time HP

announces NT support (if ever), it will be the sixth or seventh vendor to do so.

HP has also failed to pursue new markets for PA-RISC. Despite its huge internal printer business, it has not developed a PA-RISC printer controller. Nearly every other RISC vendor is diving into the PDA market, but HP is using x86 chips, not PA-RISC, in its popular palmtop PCs. HP, like many processor vendors, is involved in interactive digital TV—but not with PA-RISC.

So what if PA-RISC remains an HP-only architecture? As an \$18 billion company, HP has plenty of cash to throw around. Most of that revenue, however, comes from printers, instruments, and PCs; none of these internal customers seems interested in PA-RISC. Without external customers for PA-RISC processors, their volumes will lag behind those of the other major architectures. MIPS, SPARC, PowerPC, and possibly even Alpha will be outselling PA-RISC by mid-decade unless HP changes its ways.

The main consumer of PA-RISC chips today is HP's workstation business, but explosive growth in the total workstation market has slowed nearly to a halt recently. PA-RISC system sales totalled to about 130,000 units last year and seem unlikely to ever approach the 300,000 SPARC processors sold in the same period. Apple says that it alone will purchase more than 1 million PowerPC chips in 1994. Of course, Intel's volumes (25 million x86 chips in 1992) dwarf any of the RISCs.

Already, this low volume is impacting HP's ability to keep pace; PA-RISC has lost its performance lead to Alpha and the R4400, and a new high-end chip is nowhere in sight. HP simply can't afford to match Intel's \$100 million Pentium budget or the 300 engineers working on PowerPC. HP still has the best processor designers around—they were able to wring 100 MHz out of a 0.8-micron CPU without superpipelining—but they can't produce world-class chips on a shoestring.

HP's lack of openness dooms PA-RISC to low volumes, small R&D budgets, and niche markets. HP knows well what can happen to boutique RISCs; after buying Apollo a few years ago, management quickly eliminated all support for Apollo's PRISM architecture. With a larger installed base, PA-RISC will certainly survive for quite a while, but it is unlikely to thrive without a significant change in market strategy. ♦

