Most Significant Bits

Hewlett-Packard Joins Taligent

HP has decided to take a side in the great object war, agreeing to support Taligent's operating system and object "frameworks" on future PA-RISC systems. The company has taken a 15% interest in Taligent, which is also owned by Apple and IBM.

Object-oriented operating systems are expected to become prevalent within the next few years, but there is no agreed-upon interface between these OSs and the applications that use them. The Taligent approach is opposed by that of Next, which was recently adopted by Sun *(see 0716MSB.PDF)*. Microsoft is developing a competing standard for Cairo, and Digital has said that it will support the Cairo standard.

HP is already porting NextStep to PA-RISC and has shared earlier object technology with Sun, prompting speculation that it would join the Sun/Next axis. But HP also has been negotiating with Taligent for months and now says that the NextStep port is intended for only a few vertical markets and is not a long-term strategy.

If a particular object standard catches on at the expense of the others, it could damage the sales of systems supporting the losing standard until they can change direction. While it's too early to call a winner, HP's decision leaves Sun as the only devoted backer of Next, with Silicon Graphics as the only major player yet to choose sides.

T9000 Troubles Continue

Inmos continues to have problems with its next-generation Transputer, the T9000. Although the chip began sampling last spring *(see 070504.PDF)*, nearly two years after it was first unveiled, shipments continue to be constrained. Inmos is currently building the large (180-mm^2) die at a 4" wafer fab in Bristol (UK), resulting in a low output of chips. The transfer to a new 8" fab in Grenoble (France) has taken longer than expected; the company now expects that the new fab will begin volume shipments in 2Q94.

The T9000 has also been suffering frequency yield problems. Most chips operate at only 20–30 MHz, far less than the 50-MHz target frequency. Inmos hopes that frequency yields will be better on the Grenoble line but at this time has no hard data. The plants use similar 0.8-micron manufacturing processes.

The lack of good chips has caused at least one system vendor to move to PowerPC. Parsytec, a German manufacturer of parallel supercomputers, has disclosed a new system using the PPC 601 as a central processing node. Parsytec's previous system used T805 Transputers as processing nodes, but these chips have been relegated to I/O tasks in the new machine. The company was hoping to upgrade its system to the T9000 but now sees the

PowerPC as offering a better growth path. Parsytec also plans to sell a T9000 upgrade to its installed base—once it gets an adequate supply of chips.

PA-RISC, i960 Continue to Lead RISC Market

Well-known analyst Andrew Allison has released his latest market estimates for RISC systems and processors. The table below shows that, in 1993, HP's PA-RISC architecture extended its lead in system revenue over SPARC, racking up $7.7 billion in sales. Although SPARC has a well-documented lead in number of systems sold, the HP systems tend to be more powerful and thus carry a higher price; HP also sells more high-end servers than does Sun.

	1993		1992		Annual Growth
	Share	Revenue	Share	Revenue	
1) PA-RISC	34%	$7.7 B	31%	$5.4 B	57%
2) SPARC	23%	$5.1 B	25%	$4.4 B	16%
3) MIPS	20%	$4.6 B	20%	$3.5 B	31%
4) POWER*	11%	$2.4 B	12%	$2.2 B	14%
5) Other**	12%	$2.7 B	12%	$2.0 B	—
	100%	$22.5 B	100%	$17.5 B	28%
*includes PowerPC **includes Alpha, Clipper, 88K, and others					

On the processor side, Intel's i960 continues to lead all other RISC chips based on unit volume, as shown in the table below. Well over half of its shipments went into HP's LaserJet and InkJet printers and its X-terminals. Other architectures were far behind, although ARM and MIPS exhibited the best growth rate. The RISC processor market as a whole nearly doubled in size from the previous year. Note that these figures include only merchant shipments, not internal consumption.

	1993		1992		Annual Growth
	Share	Units	Share	Units	
1) i960	56%	4,600,000	51%	2,100,000	119%
2) 29000	11%	920,000	20%	850,000	8%
3) MIPS	10%	870,000	8%	320,000	172%
4) ARM	8%	620,000	3%	140,000	343%
5) SPARC	5%	430,000	8%	340,000	26%
6) PowerPC	4%	290,000	0%	0	—
7) Other*	6%	475,000	10%	415,000	—
	100%	8,205,000	100%	4,165,000	97%
*includes Transputer, 88K, Alpha, i860, and Hobbit					

PCI System Logic Available for Alpha

Digital is now sampling two system-logic chip sets for its 21064 Alpha CPU. Technical details of the chip sets were revealed last summer *(see 070904.PDF)*; both provide cache and DRAM control logic and a PCI bridge. The high-performance chip set, now called the 21072, implements the same 128-bit-wide interface to DRAM used in

Digital's high-speed workstations and should achieve similar performance, although the company still has not measured benchmarks using the new chip set. The 21072 set consists of six chips and is priced at $140 in 1,000-piece quantities.

A second chip set, the 21071, reduces cost by using a three-chip design with a 64-bit-wide DRAM interface. This reduction lowers the performance of the system by about 15–20%, although Digital again has not released any measured benchmarks. The 21071 is priced at $90 in the same quantity.

The new chip sets work with either the 21064 or the forthcoming 21064A and can adapt their timing to work with processors up to 275 MHz. Digital expects to begin volume shipments of both chip sets in 2Q94. The company also plans to offer design kits for the new chip sets.

Digital also announced the 21050 PCI-to-PCI bridge, the first product of its kind. Connecting two PCI buses allows a system to have more than 10 PCI loads, the limit for a single bus. Since the PCI specification requires one load per card, the 21050 can also be used to build a multidevice PCI card, which might combine multiple Ethernet or SCSI interfaces. The 21050 is currently sampling and is expected to ship in volume in 2Q94 for $23 in 1,000s.

Digital has made a strong commitment to PCI for its Alpha processors. The new chip sets allow the 21064 family to be connected easily to standard PC peripherals; the 21066 CPU has a PCI interface built in. The 21050 is the second standard PCI chip from Digital (the company also markets the 21040 Ethernet adapter), which plans more in the future, including a graphics accelerator. Thus, Alpha customers can buy chips from Digital or mix and match standard industry components.

The 21071 and 21072 system-logic chip sets, however, can be purchased only from Digital. Although these chip sets allow much simpler and lower-cost Alpha systems than previous designs that used discrete components, they are slightly more expensive than similar chip sets for x86 processors. For example, Intel's PCIset for Pentium is priced at $84, about the same as the 21071, but the Intel set includes a PCI-to-ISA bridge and integrated cache tags; these components must be added externally to the 21071. The Alpha chip sets, however, can support processors with much better performance.

Digital, Sun Expand Chip Sales Channels

Digital has announced that three well-known distributors will market and support Alpha processors and chip sets in the US. The three—Pioneer, Wyle, and Hamilton Hallmark (a division of Avnet)—will also distribute single-board computers and standard PCI interface chips. This move positions Digital to supply what it hopes will be a large number of customers using Alpha in embedded system designs.

Enhancing its worldwide reach, Sun Technology Business (STB) has announced that Mitsui Electronics will distribute SPARC chips and boards in Japan. STB was recently formed as Sun's marketing arm for these products *(see 071501.PDF)*; Mitsui is the first distributor for STB, which also uses Sun's own sales force.

AT&T Demonstrates First MPEG-2 Decoder

AT&T Microelectronics unveiled the first low-cost chip that decodes MPEG-2 video in real time, a key component for digital TV set-top boxes. The AV6101, with only 1M of external memory, decompresses a digital video stream into a digital YUV output, in NTSC or PAL resolutions, that can easily be converted to an analog format and displayed on a standard television set. The chip implements a subset of the MPEG-2 protocol; it does not fit the "main profile" because it does not decode bidirectional "B" frames. AT&T says that this feature will be supported in the next version of the 6101.

The AT&T chip is now sampling, and the company expects to begin volume shipments in 1H94. The company would not release detailed pricing but expects the chip to sell for $50–$75, which it believes is adequate for a $300 set-top box. Because the 6101 does not decode MPEG-2 audio, the set-top box would also have to include a processor to separate the audio and video streams, as well as an audio decoder. A tuner and demodulator are also required.

While AT&T is the first to reach this critical milestone, many other companies are preparing products for this potentially vast market. LSI Logic announced an "MPEG-2 ready" decoder last summer *(see 070605.PDF)*, and IIT, SGS-Thomson, and C-Cube are also readying products. Because this market is still in its infancy, being first is not as important as being the best.

Texas Instruments Dumps Mwave, Backs Spox

Barely a year after announcing its first Mwave DSP *(see 061601.PDF)*, TI has ended its partnership with IBM to promote that DSP standard. As we predicted at its introduction, competition between Mwave, AT&T's VCOS, and Spectron's Spox has caused confusion and divisiveness among vendors of multimedia solutions for PCs. Microsoft's endorsement of Spox has tipped the balance in that direction, and TI joins Analog Devices and Motorola in supporting Spox.

According to Forward Concepts (Tempe, Ariz.), a market research firm, these three DSP vendors own about 63% of the market for programmable DSPs, led by TI's 41% share; AT&T is the second largest DSP vendor with about 27%. IBM has few shipments of DSP chips but hopes to become a major player through its new Microelectronics unit. IBM says it will continue to push the Mwave standard, but with Microsoft and TI on the other side, it may be time for Big Blue to change its tune. ♦