Most Significant Bits

Alpha Makes Big Splash at Comdex

Although PowerPC had a much bigger advertising presence, Digital's Alpha showed up in a number of new products at the recent Comdex. Carrera Computers (Laguna Hills, Calif.), which also markets MIPS PCs *(see **0707MSB.PDF**)*, announced motherboards and workstations using both the Alpha 21064 and 21066 processors.

The Pantera I system is priced at $3,995 and comes with a 166-MHz 21066, 16M of memory, and a 250M hard drive but no monitor. The Pantera II packs a 200-MHz 21064 in a 32M/500M configuration with a CD-ROM but, again, no monitor. It lists for $6,995. Both systems will begin shipping "soon." Although Digital claims that a fully configured 21066 system could sell for $3,000, Carrera is not yet hitting that price point.

Several other companies announced (or announced intentions to market) motherboards using Alpha processors, including Aspen Systems (Golden, Col.), Aquarius Systems (Taipei, Taiwan), Elitegroup (Fremont, Calif.), and Modern Instruments (Kyoungki, Korea). Some of these vendors plan to begin shipments as early as 1Q94. None released pricing information.

Shannon Computers (Alton, N.H.) is hedging its bets with its Flexible Motherboard design. This standard baby-AT motherboard contains a PCI bus with a connector for a CPU daughter card. Shannon is developing 486, Pentium, MIPS, PowerPC, and Alpha modules to plug into this design, giving its customers a range of price/performance options for Windows NT.

Olivetti announced new members of its Alpha-based R7 family of NT systems, some of which are already shipping. Jaba System (Ontario, Canada) announced a high-availability NT server based on a 150-MHz 21064 processor. Northern Micro (also based in Ontario) and a German company known as ROI also revealed Alpha systems.

Digital itself published a list of more than 500 NT applications "committed" to the Alpha architecture. Other than Microsoft programs such as Excel, Powerpoint, and Word, none of the leading business-productivity programs appear on the list. ISVs most interested in Alpha are developing engineering, scientific, and financial applications that require high performance.

This series of announcements shows the level of interest achieved by Alpha in the NT community. While the response is not overwhelming, Alpha has (despite SGI ads to the contrary) staked out a position as the highest-performance NT platform. For performance-oriented software, Alpha is the way to go. For hardware vendors trying to differentiate themselves, the Digital architecture provides a performance point that Pentium can't match.

The glaring fault in the argument that RISC PCs can hit the same price points as x86 PCs is the willingness of x86 vendors to operate on much thinner margins than vendors of RISC systems. The difference between a 10% gross margin and a 30% margin can quickly wipe out the few hundred dollars saved by using a low-cost MIPS or PowerPC chip rather than a Pentium.

There are always customers willing to pay the price for maximum performance, however, and Alpha appeals to these users. The NT battle has a long way to go, but Digital seems to have found a safe niche in the current round.

MIPS NT Systems Debut

A variety of MIPS-based systems running Windows NT were also shown at Comdex. NEC, a major MIPS chip vendor, finally announced a line of MIPS systems but still will not quote pricing. The Image RISCstation desktop system uses a 67/133-MHz R4400 with a 128K, write-through, second-level cache. Graphics is provided by an S3 928 accelerator. Expansion is via two ISA slots. The Express RISCserver uses a 75/150-MHz R4400 with a 512K or 1M, write-back cache. It is expandable to two processors. Expansion is via six EISA slots. Curiously, NEC, which developed the R4200, did not announce systems using that chip.

Netpower *(see **0707MSB.PDF**)* showed both workstation and server models, all based on the R4400 and using an S3 805 graphics accelerator. The systems are based on Acer's PICA chip set. Prices range from $5,995 to $11,995 for typical configurations.

Deskstation Technology (Lenexa, Kansas) showed the first RISC-based system to come close to a volume PC price point: $2,995, including 16M RAM, 240 MB disk, and a VGA graphics adapter (the monitor is optional). The Tyne v4600b uses a 100-MHz R4600 (Orion) processor and a Deskstation-developed chip set. At the high end, Deskstation claims that its $6,995 v4633z is the fastest NT system available, using a 133-MHz R4600 with a 2M secondary cache, 32M of memory, CD-ROM drive, SVGA controller, and a 17" monitor.

A startup called ShaBlamm! Computer (Santa Clara, Calif.) showed a unique solution: a MIPS-based CPU card that plugs into a VL-Bus connector. This card upgrades a 486 VL-Bus system with an R4x00 processor. It can use the RAM on the system board, or for maximum performance, up to 64M of SIMM memory can be added on the upgrade card. The host system's 486 is used for boot-up, keyboard control, and other low-speed I/O tasks. At the show, the company offered a special price of $1,650 for a card with a 100-MHz R4000 and 16M of memory.

In the materials distributed at Comdex, Performance Semiconductor was absent from the list of MIPS licensees. Apparently, the acquisition of Performance by Cypress will mark the end of its processor efforts. With LSI Logic focusing on embedded applications, the list of MIPS processor vendors for computer applications has shrunk to NEC, Toshiba, Siemens, and IDT.

Windows NT Benchmark Wars
Digital and MIPS Technologies (MTI) engaged in a benchmarking war, each claiming that its processor is the fastest for Windows NT. MTI has been running full-page ads proclaiming their computers to be the fastest NT machines available—a claim that Digital doesn't accept.

MIPS vendor Deskstation Technologies claims that its 133-MHz R4600 system (see previous item) is more than 50% faster than a 150-MHz Alpha system, based on the Hamilton C Shell and a program called MaxEDS. MTI press materials claim that 150-MHz R4400 PCs are 35% faster than PCs using the Alpha 21064-150.

To support its counterargument, Digital quotes the Byte Portable CPU/FPU benchmarks, which show the 21064-150 to be about 20% faster than an R4400-150. And, of course, Digital points to its 200-MHz 21064 for even higher performance, and the 21064A beyond that—promising almost double the performance of the R4400.

Digital includes the Byte FPU benchmarks in its measurements, taking advantage of its faster FP math. For pure integer code, the Byte benchmarks show the 21064-150 to be slightly behind the R4400-150, as would be expected from the two processors' SPECint92 ratings. While MTI's ratings use real NT applications—a better choice than synthetic benchmarks—MTI selected the applications and ran them on Digital's system, hardly a level playing field.

Since the PowerPC version of Windows NT isn't running well enough to survive any real benchmarking, Motorola and IBM have not yet engaged in this benchmark war, though they certainly have been touting their competitive price/performance based on SPEC benchmark estimates. What really matters is not which vendor has the fastest processor, but which is shipping the fastest machine at a given price point. Until the market matures a bit, this will be hard to gauge.

Hot CPUs Seen, but Not Announced
Several leading RISC processor vendors, attempting to show how much headroom their chips have, demonstrated high-speed versions of their latest processors. As you might expect, Digital took the frequency lead with an astonishing 320 MHz, using a 21064A Alpha processor. MIPS Technologies showed a 200-MHz R4400, and IBM demonstrated a 95-MHz PowerPC 601. Of these, only the 200-MHz R4400 is likely to become a production part anytime soon; IBM only recently upgraded the 601 to 80 MHz, and Digital's top announced clock rate for the 21064A is 275 MHz, which isn't expected to start shipping until next summer.

All three demonstrations used carefully selected devices made using the same process as lower-speed production chips. Supply voltages may have been tweaked, the chips might not operate over the full temperature range, and yields are probably too low for these clock rates to be put in production soon.

x86 Vendors Unveil New Slogans, Not Chips
Vendors of x86 processors, on the other hand, were not emphasizing performance, and no new chips or clock speeds were publicly demonstrated. Despite widespread expectations, Intel did not show its 0.6-micron version of Pentium (P54C). The company emphasized three points: that it takes an enormous investment in fabrication facilities to compete in the microprocessor business; that 486DX2 systems will be upgradeable with a Pentium-based OverDrive processor; and that Pentium systems are here today from a wide variety of vendors.

AMD did show the next-generation "shrink" of its 486. Fabricated in AMD's 0.55-micron "CS24" process, the chip is smaller than AMD's (or Intel's) 0.8-micron 386 chip. This version of the 486 will run only from a 3.3-V supply, and AMD expects to achieve 100 MHz operation. Production is not expected until 2H94.

TI showed its recently announced 486SXL and 486SXLC, and Cyrix formally announced its 486SLC2—a clock-doubled version of its well-established 486SLC. The company's new slogan is Cyrix Instead, a wry retort to the Intel Inside campaign. As expected *(see **0715MSB.PDF**)*, Cyrix joined AMD in licensing the Windows Compatible logo from Microsoft.

Next Ports to SPARC
Steve Jobs joined fellow *wunderkind* Scott McNealy to announce that Next will port its object-oriented Next-Step operating system to the SPARC architecture. That OS is already available on x86, PA-RISC, and Next's defunct 68000-based "black cube" systems. Neither Next nor Sun plans to sell NextStep-on-SPARC systems directly, but they will allow systems integrators to put the pieces together. As part of the deal, Sun will purchase a small ($10 million) share in Next.

Perhaps more importantly, Sun says that it will add Next's object technology into Solaris. This will not only make the Sun operating system compatible with existing NextStep applications, but it will position Solaris to compete with future object-oriented software from Microsoft (Cairo) and Taligent. Although it appears that this effort will cause Sun's version of UNIX to diverge from other vendors' just as a grand unification appears to be on the horizon, Sun claims that the new extensions are compatible with the efforts of the COSE group. ♦