

UNIX[®] NEWS

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DEC RECASTS VAX LINE

NEW RISC SYSTEMS INCLUDE £6000 WORKSTATION

DEC revealed its expected flurry of new products towards the end of last month, including a second generation of its Unix workstations, in one of its most important announcements for some time. Although the company chose to major - at least in the UK - on the complete recasting of its VAX minicomputer line, which sees all the 8000 models superseded, discontinued and priced out of the market, the new MIPS RISC based workstations were the real stars of the show. The 8Mb DECstation 2100, which uses a 10 MIPS, 12.5MHz version of the R2000 chip, comes in below the DECstation 3100 launched back in January - the monochrome unit is priced from £6,625 and an eight-plane colour system starts at £9,000 - both are expandable up to 24Mb and available now. DEC demonstrated the seriousness with which it is building up a Risc line of products as an alternative to the VAX, with new mid-range Risc systems - the DECsystem 5400 and dual processor DECsystem 5800 - using the Mips R3000 chipset, equivalent to the top-end MicroVAX and low-end VAXstations, according to DEC. Indeed, DEC President Ken Olson says the company is considering major changes to the VAX line that could see it recast as a RISC-based family by the mid-1990s. Advanced research and development work has begun on the proposed project, and the company is looking at the feasibility of both re-implementing VMS for a RISC architecture and combining VMS and the Ultrix Unix into a single operating system, shadowing the Unix efforts at Hewlett-Packard, (see below). DEC has also promised to implement compliance with Posix in VMS.

HEWLETT PROMISES POSIX COMPLIANT MPE

Hewlett-Packard Co is proceeding apace with its open systems strategy and the next step will be to offer a Posix-compliant version of its proprietary MPE operating system on the 32-bit RISC-based models of its HP3000 business computer line, following DEC which is working on a Posix version of VMS, (see above). Hewlett is promising that users will be able to run MPE and Posix concurrently, allowing access to both general purpose Posix compliant software alongside existing MPE software designed for high performance transaction processing. The first step will be to provide developers with a Posix shell and the Open Software Foundation Motif user interface to enable them to create versions of their applications for the HP3000. Separately, the company confirmed that it has stopped selling the original HP9000 Model 840S Unix RISC machine in a move towards phasing out the original TTL versions of its Precision Architecture in favour of newer implementations of the CPU fabricated in NMOS and CMOS.

SCO SHIPS ITS FIRST UNIX OPERATING SYSTEM

The long awaited Unix System V/386 from the Santa Cruz Operation is finally with us - the company has announced that first customer shipments are on their way. It is the first operating system licensed by AT&T to carry the Unix trademark, and has been waiting in the wings for some time after beta test delays earlier this year pushed back plans for a March launch. SCO Unix V/386, which is fully compatible with SCO Xenix System V, will also run on 80486 systems, and incorporates the National Computer Security Centre's C2 security level, the first 386 Unix system to receive such clearance. It is POSIX and X/Open conformant, and includes Acer Counterpoint's fast file system and AT&T's File System Switch, which allows transparent access to DOS, Xenix and Unix filesystems. SCO Unix System V/386 for 386 AT compatible systems is available now. Versions for PS/2 Models 55sx, 70 and 80, and Micro Channel Architecture 386 compatibles will be available in the third quarter, and Extended Industry Standard Architecture support, now being developed in conjunction with OEMs, will be available later this year. The two user version has a UK price tag of £525, and the unlimited multi-user version is £750. The corresponding development system environment will be available in the third quarter, priced at £875.

MEIKO ADDS FORTRAN, C TOOLS FOR IN-SUN TRANSPUTERS

Transputer specialist Meiko Scientific Ltd of Bristol, has developed its In-Sun Transputer-based Computing Surface boards into a family, and added a new set of parallel processing tools to encourage software developers. There are four boards in the series using from four to 16 Transputers, designed to fit into a Sun-3 or Sun-4 workstation. The boards boost performance from 20 to 400 MIPS and from 6 to 150 MFLOPS using multiple boards, according to Meiko. Prices start from £8,000 for boards, and from £33,000 for a full turnkey system. Meiko's CS Tools include the first Unix-compatible symbolic debugger for the Transputer and standard sequential language compilers that allow programmers to write portable parallel applications in Fortran and C without recourse to a novel language. Also announced was the 'Ensemble' program for third-party companies wishing to develop and market products developed on the Computing Surface, offering early access to new products together with concessionary price rates. Meiko says it is also to reveal a second European installation of its powerful full-scale MIMD Supercomputer - the first is at the Edinburgh Concurrent Supercomputer project in Scotland.

PICK TO MERGE WITH UNIX

Pick Systems, Irvine, California, looks as though it is set to get heavy in its Unix relationship - according to Steven Kruze a 12 to 18 month development programme is in place at the company, the aim of which is to provide seamless integration between Pick and a variety of operating systems, including the most popular flavours of Unix - at present Unix commands cannot be executed from within Pick, a user can only switch between them - first on the picking order is AIX, to be followed by Xenix, Unix System V and MS-DOS. The company has apparently had talks with the Santa Cruz Operation, and has taken away with them an SCO developers kit.

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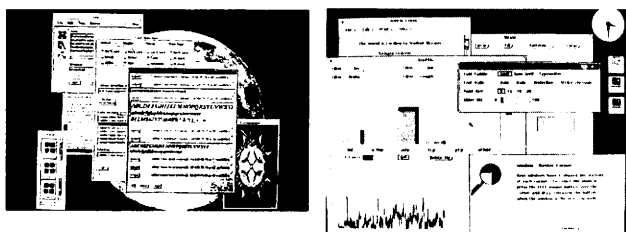
XHIBITION '89 MARKS RAPID PROGRESS FOR X-WINDOWS

The Xhibition '89 conference and exhibition held last month in San Jose, California proves that the X11 protocols and the X Window System from the Massachusetts Institute of Technology have made great strides over the last year - but it also showed that much remains to be done. The show left one pondering some questions about X, the most obvious of which is "where's the software?". Tektronix Inc, the Beaverton, Oregon display station manufacturer put out a list of X-compatible software in conjunction with its own X-terminal launch (see page 4). That list includes about 50 applications. ISVs and hardware manufacturers think that's an acceptable number, given that X11 specifications weren't generally available until last January. But more importantly, much is being held back while the world waits on the Open Software Foundation and the arrival of a finished OSF/Motif graphical user interface, when the real push for X11 applications will begin.

Wither X-Terminals?

The second question is the future of X-terminals. With PCs coming up from below and Unix workstation moving down from above, X-terminals will be caught in a price squeeze. Although prices range from just under \$1,000 for an Acer Counterpoint terminal, that doesn't include the real per-user cost - the host cpu across the network that the X-terminal is attached to doesn't come free. But the Acer Counterpoint Model 100 isn't expandable. A more typical X-terminal might be the NCD16 from Network Computing Devices Corp, which lists for \$2,850 with 512K of RAM, barely enough considering that desktop managers like Visix's Looking Glass and IXI's X.desktop require at least half that. Add in communications overhead and room to run applications and it starts to look like at least 2 Mbytes for most users. And at \$600 per extra megabyte the cost comes to almost \$4,000, not including the per-user cost of the host. From below, companies like Graphics Software Systems and Locus Computing Corp are offering low-cost software packages to transform DOS-based PCs into X workstations.

OSF/Motif versus AT&T/Sun Open Look



The contenders: OSF/Motif and AT&T's OpenLook.

That's the easy question. Forget Open Look, the world is moving to OSF/Motif. Yes, ISVs and hardware manufacturers quickly add diplomatically, we'll do whatever interface our customers ask for. We'll even do Open Look, if somebody other than AT&T or Sun asks for it. Since AT&T and Sun are the only takers, ISVs are working on OSF/Motif implementations just as fast OSF programmers can shove it out the door. A couple of booths were showing Motif prototypes, but nothing real until September at the earliest. You may have thought that OSF/Motif's victory would settle the Unix market's long, long search for an industry standard, easy to use graphical interface. Not really. It's just moved on to the next battleground, desktop managers. OSF/Motif specifies a "look and feel" but not what features it should include, and how the user interface should manage system resources and applications and access to them. Two rivals - the UK's IXI Ltd of Cambridge, and Visix Software Inc of Arlington, Virginia, have emerged.

HARDWARE NEWS

ENTRY LEVEL AND MID-RANGE SYSTEMS

Hewlett-Packard Co has extended its HP 9000 Series 800 Unix RISC family downwards with the launch of the entry-level, multi-user Model 815S, which comes in at \$14,900 while providing 85% of the performance of the current Model 825S computer at 60% of the price. The first CMOS implementation of HP's Precision Architecture, the new machine closes the gap between the Series 800 Risc family and the 80386-based PCs: it comes with two serial ports, 8Mb main memory and a 16-user licence for the HP-UX implementation of Unix System V.2; a fully bundled system for 16 users will be £23,000, with Precision Architecture CPU, 8Mb memory, 300Mb disk drive, a tape cartridge system, 18 serial ports and a 16-user HP-UX licence with the operating system pre-loaded on the disk. Entry level model is £11,500. Both versions are planned to ship worldwide in September and H-P has signed up two new distributors for 9000 Series 800 systems in the UK - Perrin Systems Ltd, Barnsley, South Yorkshire, and Protek of Central London - both already distribute H-P's workstation line.

And Hewlett-Packard Co has cut prices by up to \$1,300 on 80386-based models of the HP Vectra PC family to keep them competitive priced with comparable IBM and Compaq products. The 300Mb disk Vectra RS-25C 304e is cut 8.2% to \$14,399; the RS-25C Model 154e falls 6% to \$12,550; and the Model 150e and 100e are cut by \$750 each to \$10,150 and \$9,550. The company has also added hard diskless Vectra RS-25C Model 10e and Vectra RS-20C Model 10e models at \$7,350 and \$5,700 respectively.

In the UK, NCR Corp has cut prices on its Tower family of Unix supermicros by between 20% and 25%, with the 4Mb 32/450 with 380Mb disk and 16 ports falling 25% to £17,000. The 32/650 models and the 32/825s are reduced by 20% and the top-end 32/850s are reduced by about 25%.

Pyramid Technology Corp, Mountain View has reduced the entry-level cost of its mainstream MIServer range with two new models aimed at office and departmental use. The new systems include the Office MIServer, or MIS-2, with one or two of Pyramid's proprietary RISC processors, supporting up to 128 users with a performance of 14 or 28 MIPS, 64Mb memory and up to 8Mb of disk; and the Departmental MIServer, or MIS-4, which comes in one- to four-processor configurations and supports up to 512 users and has 128Mb memory and 64Gb disk storage. The systems feature a multiple bus architecture with high performance SCSI support on the low-end machine, and sit above the re-badged machines from MIPS Computer Systems which Pyramid is now offering for entry-level customers. Like the top-end Corporate MIServer range, which come with up to 12 processors for 1,000 plus users, the new systems use Pyramid's 40Mbytes-per-second Xtend bus for the input-output subsystem, and run the OSx 5.0 dual implementation of Unix System V and Berkeley 4.2 operating system. Prices start from \$78,000 for the MIS-2 and \$100,000 for the MIS-4.

AT&T Co has announced the first products from its OEM pact with the systems division of Intel Corp - four 80386 and 8386SX machines designed to be networked with mainframes, minis and other personal computers. AT&T also introduced several integrated and packaged servers using the new 6386-25 WGS and 6386-33 WGS Model S machines and covering local network, host communications, database and facsimile image servers. The new machines, ranging from the 80386SX model to a floor-standing 33MHz 80386 model, provide a "unique" remote management capability under Unix System V/386 3.2.2 for distributed networked applications. Prices range from \$3,000 to \$22,225 and the machines are planned to be available internationally in the first quarter of 1990. Canadian distribution will begin by the end of the year, but the UK will have to wait until first quarter 1990.

Unisys Corp's San Jose, California based Network Computing Group - previously the Convergent Inc side of the company - is to use Motorola's 88000 RISC chip in a new generation of multi-user departmental servers from hosting 25 to 250 users, and priced between \$25,000 and \$250,000. The new machines are expected in around 12 to 18 months time.

AT THE TOP END

Nixdorf Computer AG has launched a series of new Targon machines, including two Motorola-based Targon/31 systems and two top-end Targon/35s. The Targon/31s use Motorola's 68030 processor, and include the 32-user Model 15, with 8Mb to 24Mb memory, and the 64-user Model 45, which has up to three 68030s, including 16Mb global memory and up to 8Mb on each CPU. Total storage is 1.4Gb using new disk options of 182Mb, 384Mb and 702Mb, and Nixdorf offers the option of 155Mb tape streamer or 2.2Gb videotape back-up systems. Systems include a dedicated input-output processor and optional 68882 maths co-processor. The Targon/35s, based on hardware bought in from Pyramid Technology Inc, include the Models 60 and 70, with from one to four processors and up to 64Mb memory, rated at 48 MIPS for top-end configurations. The machines have a 256Kb data and instruction cache. Launched in Germany, equivalent US prices start at \$20,000 for a /31 Model 15 with 8Mb memory, 182Mb disk and four ports. A 16-port Targon/35 Model 60 with 16Mb memory and 380Mb disk costs around \$100,000, while a four processor 64-port /35 Model 70 costs \$350,000 with 64Mb of memory and 1.1Gb disk storage.

Bolt Beranek & Newman Inc, already using the part in an SNA communications product, has constructed a parallel processor around the Motorola 88000 RISC microprocessor that will come in above its 680X0-based Butterfly machines. The Cambridge, Massachusetts-based firm rates the TC2000 at 9,576 VAX MIPS in maximum configuration - individual 88100s are rated at 19 VAX MIPS. The TC2000 comes with from eight to 504 processors to give a performance range of 152 MIPS to 9,576 MIPS, and 160 MFLOPS and 104 MegaWhetstones to 10,080 MFLOPS and 6,552 MWhetstones fully configured. Prices start at \$320,000 with eight processors, and the first shipment, of a 32-CPU model, will be to the European Centre for Research and Advanced Training in Scientific Computation, Toulouse.

Evans & Sutherland Computer Corp has overcome the chip problems at its two suppliers of custom parts that threatened its entry into the supercomputer business, launching the ES-1 supercomputer. It offers 1,600 MIPS and 1,600 MFLOPS of performance in a maximum configuration which has eight processor complexes, each consisting of up to 16 computational units, each unit claimed to deliver half the power of an IBM 3090-180 in scientific work. The scalar processing, virtual memory based machine has up to 2,048Mb of main memory and from 8.5Gb to 450Gb disk, and its parallel architecture allows multiple problems to be run at the same time. It runs the ESIX operating system, a full implementation of Berkeley Unix 4.3 with bolted on Mach features. The Mach system is an extension of BSD developed at Pittsburgh's Carnegie-Mellon University to support multiple processors. It comes with the Evans & Sutherland parallel programming environment - ESPRE - which enables users to build parallel applications or port existing programs, as well as 38 CAD and CAE software applications already residing on the ES-1. A two processor ES-1 system costs \$2.2m, rising to \$8m for an eight processor system, and it begins shipping this Autumn.

--- NEWS ROUNDUP ---

Following the demise of Control Data's ETA Systems division, for which the company has now substituted joint marketing agreements with **Cray Research** and **Convex Computer** (see Wheelin' and Dealin'), the latest company to get cold feet over the supercomputer business is **Concurrent Computer Corp**, which has pulled out of its **Supercomputing Solutions Inc** joint venture with **General Microelectronics Corp**. Concurrent is to receive 150,000 shares of General Microelectronics common stock in return for its contributed technology and previous investments in the project, and General Micro will re-name itself **Supercomputing Solutions Inc**. Princeton University's Napier-Stokes parallel processor is to be the basis of the 800 MFlops Capps machine due out in January - a previous version was previously licensed from Princeton by Concurrent, and this licence now goes to General Micro. Concurrent chairman James Simms said the company would now concentrate in its core business of real time systems. Although the withdrawal is certainly a financial blow to the programme, General Micro hopes that the move will draw more external funding.

Unisys Corp has chosen **Motorola Inc's** 88000 processor as the basis for a future generation of high end systems. Sources said the products would serve from 25 to 250 users and cost between \$25,000 and \$250,000. The move gives a big boost to Motorola's efforts in the RISC stakes, but puts the promise of Unisys developments using the **Sun Microsystems' Sparc** processor rather in doubt: John Chen, general manager of RISC at the Unisys Network Computing Group in San Jose, California, said that although no specific plans for Sparc developments had so far emerged, the chip was still being looked at seriously, and might eventually emerge in a product "in the workstation direction". Others choosing the 88000 recently included **Bolt Beranek and Newman Inc** for its new generation Butterfly parallel processor, using up to 504 processors for top performance ratings of 9,500 MIPS, and the UK's **SyFa Data Systems Ltd**.

Meanwhile, **AT&T**, which in the US recently launched a new series of low-end 80386-based machines sourced from **Intel Corp**, said that RISC processors would be an essential element in future 3B machines, to be introduced within two years - and AT&T also appears to be looking at another RISC aside from the Sparc, which it originally committed to two years ago. And **Hewlett-Packard** is to enter the merchant micro-processor market with a new generation of its Precision Architecture RISC processor. The first licensee is **Hitachi Inc**, and HP says it is pursuing similar agreements with "other strategically selected companies".

X/Open could be the peacemaker in the battle to establish either OSF/Motif from the **Open Software Foundation** or Open Look from **AT&T** as the user interface of choice on Unix systems. X/Open is looking into the possibilities of establishing a common applications programming interface that will support both products, rather than opting for one or the other. But the technical difficulties of such an approach may be too much to overcome, according to some experts. Both interfaces are now available to the general market.

And the **Open Software Foundation** has announced nine new members, bringing its total up to 150: the new members include **Alliant Computer Systems**, **Emulex Corporation**, **IXI Ltd**, **Motorola Computer X** and **Yokogawa Electric Corp**.

WORKSTATIONS

Silicon Graphics has launched its most powerful system to date, a new high-end multi-processor based on the MIPS R3000 Risc CPU and R3010 floating point unit, along with a new mid-range system, a low-end server, and enhancements to its Personal Iris ranges. The top-end Iris Power 4D/280 server uses eight processors running at 25MHz, and delivers 160 MIPS and 28 MFLOPS for a base price of \$172,000, according to the Mountain View, California-based company. It will be available in September. The mid-range 4D/210 has a single CPU and floating point unit for a computational performance of 20 MIPS and 3.3 MFLOPS, but also includes the Silicon Graphics GTX graphics subsystem, which can generate up to 100,00 independent polygons per second, said the company. Prices begin at \$95,000 for the workstation, or \$54,000 for the server: available immediately. Also included in the announcements was the 4D/25S, a 16 MIPS, 1.6 MFLOPS low-end server using the 20MHz chipset and costing just under \$13,000 with 8Mb memory, 170Mb SCSI disk, the Irix (Unix) operating system and an Ethernet interface. Meanwhile, Silicon Graphics is offering upgrades for the Personal Iris family to the 20MHz R3000 chipset, giving 60% more performance and a larger cache memory (32/64 Kbytes) for an extra \$5,000. It will now offer both R2000 and R3000-based Personal Iris systems, reducing the lower performance models by an average of 31%, lowering the entry price from \$18,000 to \$13,500. Turbo graphics options increase graphics performance by three times. New software includes the VoxelLab volume rendering product, developed in conjunction with Fairfield, Iowa-based Vital Images Inc; and a bundling deal to include the Wavefront Personal Visualiser rendering software with all Iris 4D systems.

European consortium funded by the European Economic Community has been formed "to design and build a general purpose technical workstation aimed at meeting the needs of engineers and designers in the next decade". The workstation, which aims to be "100 times more powerful than today's workstations", says it will produce a 1000 Mip system by the mid-1990s - it will be a multi-function technical station with a three dimensional user interface and multi-processor architecture. Partners in the Consortium are a mixture of academic and industrial research organisations, including lead partner Kontron Elektronik of Munich, with Dutch Unix experts Associated Computer Experts (ACE) of Amsterdam, French electronics company Caption of Rennes, British Aerospace Systems and Equipment of Bracknell, and three University's; Tuebingen in Germany and the the UK's University of Sussex and Queen Mary College in London.

TERMINALS

Tektronix Inc revealed the fruits of its agreement with Network Computing Devices and showed off a pair of NCD-based display terminals at the Xhibition last week (see page 2). The colour XN11 is a high resolution (1024 x 768), high performance 15" display station using dual Motorola 68000 processors with up to 8Mb memory, maintaining compatibility with software written for Tektronix 4111 and 4200 terminals - cost is \$7,495. The monochrome XN5 has a 16" 1024 x 1024 screen and a single 68000 processor with independent graphics co-processor, with up to 4.5Mb memory: no price given. Both have an Ethernet TCP/IP interface and RS-232C host ports.

And Network Computing Devices itself has given a much needed boost to the performance and size of its X-Terminals, introducing a new 19 inch screen model - the NCD19. It offers a resolution of 1280 by 1024 pixels compared to the NCD16's 1024 by 1024, and performance is ramped up with the use of a 15MHz 68020 processor, as opposed to the 68000, coming with 2Mb memory which can be extended up to 8Mb. Like the NCD16, with which it is fully compatible, the NCD19 can simultaneously access multiple hosts running Unix, VMS or Ultrix, supports Ethernet with TCP/IP or optional DECnet protocols, and works with a range of graphical interfaces including Motif, Open Look and Xview. Available now, prices start at \$3,750.

MICROPROCESSORS

Intel Corp has unveiled its two-chip set that implements the 32-bit Extended Industry Standard Architecture bus. The set comprises the 82358 EISA bus controller and 82357 integrated system peripheral. There's also an 82352 EISA bus buffer and 82355 interface chip for add-in boards. The integrated system peripheral integrates direct memory access control, timer-counter, interrupt control, bus arbitration and DRAM refresh functions, with 33Mb per second direct memory access transfer rate. The bus controller interfaces with the 8-bit PC and 16-bit AT buses, the 32-bit EISA bus and the host processor, and works with the 80386 and 80486. The bus buffer offers a higher integration for the system board, and native add-in cards can be made using the bus master interface controller. The parts are in 1.5 micron CHMOS III; the bus controller and integrated system peripheral are available now in at £72.27 and £87.60 for 1,000-up. Samples of the master interface controller are also available at £25.55; the bus buffer samples in September at £13.69 for 1,000 up.

The new Peak family of AT bus chip sets from San Jose-based Chips & Technologies Inc is designed to support the fastest 80386 microprocessors currently available, future 80386 speed upgrades, and 80486-based microcomputer systems. There are currently two three-chip sets, with a common cache-based architecture, individually optimised to maximize 80386 or 80486 system performance. The Peak/386 supports 20MHz supports 20MHz, 25MHz, 33MHz, and 40MHz 80386-based systems and also supports 80486 microprocessors, while the Peak/486 is optimised for the 80486 and can be used with chips having clock speeds of 25MHz, 33MHz and 40MHz, and the sets enable customers to do complete 80386 or 80486 motherboards with just 19 components plus memory. The architecture features an integrated cache/DRAM controller with up to 128Kb of fast Static RAM cache, can handle 256K-bit, 1M-bit or 4M-bit dynamics configured as up to 128Mb of main memory, and is optimised for OS/2. The Peak/386 also supports 80387 or Weitek 3167 maths co-processors. The Peak/486 offers a secondary cache of up to 128Kb to supplement the 80486 8Kb on-chip cache. The Peak/386 set consists of 82C311 CPU/cache/DRAM controller, the 82C315 bus controller, and the 82C316 peripheral controller. The Peak/486 consists of the 82C312 CPU/cache/DRAM controller, the 82C315 bus controller, and the 82C316 peripheral controller. They come in 160-pin plastic flat packs, and Peak/386 samples will be available in July with Peak/486 samples following in January next year. In quantities of 1,000-up the Peak/386 will cost \$160 and the Peak/486 will be \$180. Chips & Technologies Inc has also come out with what it claims is the first single chip solution for graphics cards compatible with IBM's 8514/A graphics standard. The 82C480 graphics processor is accompanied by an interface driver that provides compatibility with the 8514/A Adaptor, so that programs bypassing the adaptor interface and writing directly to the registers, such as Windows and Presentation Manager software, will run.

Motorola Inc's Microprocessor Products unit says that is now sampling 33MHz versions of the 88000 RISC, and claims that the new part delivers 28 MIPS. Fabricated in 1.2 micron CMOS, the 33MHz 88100 microprocessor is sampling at \$894 in single quantities and the 33MHz 88200 cache and memory manager is \$1,171. The company gave no date for volume shipments of the parts.

Intel Corp's 80486 is still new enough that there is mileage to be had from announcing plans for the chip, and Advanced Logic Research Inc of Irvine, California is ready with a Micro Channel 80486 PowerCache 4 with a proprietary 128Kb read and write-back cache claimed to outperform IBM's PS/2 80486 upgrade by 37%. Out in September, it will be \$10,000 with 2Mb CPU and 1.44Mb floppy disk.

BOARDS

UK parallel processing specialist Real World Graphics has abandoned its Motorola 88000-based Reality and Super Reality graphics supercomputers, in favour of new versions using Intel Corp's i860 processor - claimed to be the first to use the one million transistor part in a commercial product. The Hertford-based firm has now introduced its Reality single board VME system (which can be used in multiple configurations) for availability this month, but in September promises the new version of its Super Reality model, a parallel processor with geometry, rendering channels and frame buffers on separate boards. Both systems are designed for multi-channel display configurations for use in simulation systems. Performance from a fully populated Super Reality with up to 80 i860s should be around 1000 MFlops. The VME board Reality product, which can be hosted within a workstation, has two i860 processors with 4 or 16Mb DRAM and a 1024 x 1024 frame buffer with four overlay planes. Super Reality consists of both Geometry and Rendering boards, each with four i860 processors providing several hundred Mips and MFlops. Up to 20 boards can be used in a single system, which can be configured as a terminal product with standard interfaces, as a self contained workstation with local disks and networking, or anywhere between. There are a full set of graphics subroutines based on Phigs+, and Software System's Multigen package for the production and editing of real-time 3D databases and models is also available. Prices in the UK start at £18,000 for Reality, and £25,000 for a single board Super Reality.

Sony Microsystems Co, Palo Alto, has signed to use Santa Clara-based Parallax Graphics Inc's Viper series of high-performance colour graphic and videographic display controllers with its NEWS family of multiple 68030-based Unix workstations. Equipped with the optional Viper video input card, a VMEbus board that can be used with 32-, 16- or 18-bit microprocessors, the workstations will be able to be used in such multi-media applications as video production and computer-aided instruction. The Vipers include device drivers for the X Window System Version 11.

Fujitsu Microelectronics Inc Advanced Products Division in Santa Clara, California has gone to Eastman Kodak Co's Interactive Systems Corp in Santa Monica, California for its implementation of the SunOS Unix to be marketed with a new Fujitsu S-25 Sparc VME board set. The Fujitsu S-25 Sparc board set will support both the Fujitsu S-20 and S-25 versions of the processor, claimed to deliver 12 to 15 MIPS. The Fujitsu unit supplies the Integer Unit and the Memory Management Unit as well as the EtherStar Ethernet controller, and the board set will also use the Weitek Corp 3170 Floating Point Processor and support Sun's graphics frame buffer. The S-25 board set will be configured with 8Mb of memory, but will support up to 16Mb.

IMAGE PROCESSING

The latest attempt to combine digital image processing with traditional data processing comes from scanning system specialists Scan-Optics of Irvine, California. The Scan-Optics system consists of a 386-based image control processor front-ended by a Pick micro, either from Scan-Optics or from another manufacturer. Pick applications and data can be quickly modified to access image data on the image control processor through an interface driver and Pick Basic imaging library, and Scan-Optics also includes an image file manager, network server and device driver software on the image control processor, supporting laser printers, faxes, scanners, and image processing stations or MS-DOS PCs connected up to the Ethernet-based network. Scanned images are compressed, assigned an identifier, and called up through standard Pick procedures to be displayed on the 19" or 15" image display stations alongside text. Systems will support up to 24 users and have from 100Mb to 600Mb of disk storage attached to the image control processor. Prices should be in the \$100,000 to \$170,000 price bracket, with shipments beginning next month. A Unix version is a likely prospect in the future.

WHEELIN' AND DEALIN'

Julyand the heat goes. With an urgent requirement to build new businesses following the abandonment of its ETA Systems supercomputer business, and the proposed sale of its Imprimis Technology disk drive unit to Seagate Technology, Control Data Corp is hoping to exploit its residual skills in the systems integration business, for which it needs computers comparable with the ones it has stopped making. It has already decided to hand supercomputer customers over to Cray Research Inc where appropriate, and has now signed a worldwide sales and marketing agreement with Convex Computer Corp under which it will sell and integrate the Convex C Series of minisupercomputers into specific countries, markets and accounts.

Arix Corp plans to take a decisive leap upmarket with the acquisition of privately-held Edgcore Technology Inc, the Phoenix, Arizona company that has reimplemented the architecture of the Motorola 68000 family of microprocessors on gate array chip sets that deliver performance said to be around twice the performance of the as yet unannounced Motorola 68040.

The computer systems and services house Mlsys is certainly blooming in the sun - it must be coming close to the critical mass that will enable it to buy just about any company in the UK computer market - last month's addition to its stable was Unix house Team Systems Group of London, bought for £10m. And the giant in the making is also strengthening its place in the DEC marketplace, buying up the Thames Ditton, Surrey based Enterprise Systems Group for £1.6m. New Mlsys sibling TIS has also been paddling further out in Unix waters, signing up four Aitos dealers who will add the MIPS Computer Systems range of RISC based machines to their ranges. The four are Mytec of Birmingham, Systems Research of Manchester, London based Whiterakes and Hemtech of Croydon. And TIS has a contract to supply five MIPS Computers M/120 servers and 90 Apple Mac II cxs to London based building design consultancy YRM Partnership worth £850,000.

Apricot Computers plc has acquired Woking, Surrey-based software house Logical Systems International, Logsys - the acquisition gives its Apricot Sigmex graphics division additional programming resources. And the Sigmex subsidiary has signed a strategic alliance with Harris Controls, a division of Harris Corp, Fort Lauderdale, Florida. The companies will jointly market the Harris M9000 human interface for SCADA/EMS, Harris' control interface for electrical transmission and energy management systems, which will run on the Sigmex AS 800 range of graphics workstations, and should be of interest to the growing market for energy management systems in the UK, West Germany and the Netherlands.

Phoenix Technologies Inc and Texas Instruments Inc are to sign an agreement that will make available all the necessary chips and software to enable manufacturers to build true clones of Sun Microsystems Inc workstation built around the Sparc microprocessor.

The Vistec Group Plc, Belper, Derbyshire has decided to branch into the Unix market, paying the equivalent of £2m for Level V Distribution Ltd, a distributor specialising in microcomputer Unix systems integration and Unix network products and services.

The long forecast realignment in the European computer industry is likely to start in the next couple of months with a consortium move on Nixdorf Computer AG - the name that is ringing the loudest bell is that of Philips NV, but Siemens AG and Ing C Olivetti SpA could well be involved, while Bull SA and ICL should not be ruled out.

As expected, Solbourne Computer Inc has made its first move into Europe with the establishment of a UK subsidiary operation based in Swindon, Wiltshire.

THE UNIX GENIE IS OUT OF THE BOTTLE, THREATENING ALL PROPRIETARY ARCHITECTURES

Almost unnoticed, the computer industry has split into two price-performance curves that are diverging at what must feel like the speed of light for those who are stuck on the wrong one. The high-price modest performance curve is occupied by the surviving proprietary architectures - led by IBM's 3090, 4381, 9370, AS/400, DEC's VAX/VMS, Unisys A and 1100, ICL's VME and the various GCOSes at Bull. The low-price, soaraway performance curve is occupied by RISC architectures plus the two surviving mass-market complex instruction set microprocessor families - IAPX-86, MC68000, in all cases running one or other version of Unix.

Initially it was only at the low end of the market that users began deserting proprietary architectures for Unix in droves, so that the companies that suffered most were the low-end minicomputer manufacturers, but the trend is now shooting up into the mid-range, which is one reason why the IBM 9370 has been such a complete failure as a new-user small business computer, and why AS/400 sales are beginning to slow: a good half of the System/36 base could well take two looks at the price to be climbed to to get aboard the AS/400 line and seriously consider a switch to Unix instead.

Hewlett-Packard

The switch has been a disaster for the likes of Data General, Prime Computer, Norsk Data, and it has now begun to lay waste the Wang Laboratories VS and the Nixdorf Computer 8870 bases. By contrast, Hewlett-Packard Co, which saw it coming early and planned for it accordingly, is flourishing. The problem for the pushers of proprietary architectures is not initially that they lose their existing customer base, but that they find almost overnight that their bases have stopped growing. Since no computer manufacturer has ever budgeted for no growth until the bailiffs are banging at the door, the sudden loss of new business has a disproportionate effect on profits, and the dismal routine of lay-offs, plant closures and cut-backs to try to downsize the business and get it back onto an even keel comes into play. The problem then is that the cuts mean that the existing customer base gets less attention than it expects, much less than its Unix-using neighbour on the block whose supplier is on a rising curve, and very soon the straitened means of the proprietary architecture vendor means that there are not the resources to bring the next generation of hardware and operating software out in a timely fashion, and so the loyal base begins to erode as well, at which point the merchants of death in the shape of the mergers and acquisitions pushers and the lethal leveraged buyout wreckers start massing like malignant Mafiosi.

DEC

Strikingly, DEC seems to have spotted the mortal danger to its core business just in time - and its recognition of the urgency is underlined by the fact that it decided that it couldn't afford to wait for its own designers to come up with a suitable RISC architecture, and it went out and bought one in from MIPS Computer Inc, a reassuringly inoffensive-looking Sunnyvale company that did not seem to pose a threat to anyone. That remains to be seen, but having bitten the bullet, DEC has leaped aboard the low price, high performance curve without a backward glance, and is just keeping its fingers crossed that the MIPStations will start delivering the enormous volume it needs to keep margins healthy fast enough to make up for the inevitable tailing off of the VMS line whenever that starts to bite.

And early signs are that DEC may have made the switch just in time, but it seems highly likely that the forthcoming Aridus VAX CPU will be the last VMS machine from DEC that will be more powerful - at least for a month or two - than its most powerful Unix machine: there is a 60 MIPS ECL implementation of the MIPS Computer R-series RISC family in the pipeline. And even Tandem Computers Inc, the one company in the industry generally regarded as having a unique solution for high-volume transaction processing, is heavily hedging its bets and has signed to use the MIPS RISCs and is busily gearing up for its own plunge into Unix. The problem for IBM is that the industry-wide rush for Unix at the low end and the mid-range is starving it of future customers for its top-end mainframes, so much so that when the 4381 base has moved up to IBM's next generation top-end mainframe line, there will be no source of new users to provide horizontal growth of the top-end base: all the available growth will come from upgrading the existing MVS base, which means that with the steady improvement in price-performance that characterises all architectures, whichever curve they are on, IBM's mainframe business will go from slow growth through no-growth to decline in perhaps as little as 12 months.

IBM

And IBM could well be about to hasten the process: users are hearing hints that the company is thinking about adjusting its software licensing terms so that instead of attaching licences to machine model numbers it will attach them to physical processors, so that if a user partitions a 3090-500 into a 300 and a 200 and runs it that way, it will attract two software licences. IBM may have to think again on that one, because the rumblings of discontent about the sky-high cost of IBM mainframe software would almost certainly become a roar, and third party IBM software developers would start rushing to do versions of their applications to run under Amdahl Corp's native 370 Unix, UTS, and the switch would be complete with 3090s being seen as plug-compatible Amdahls - Amdahl will license 3090 users to run UTS if they ask for it. Is it too late for IBM to retrieve the situation? It would cost the company two years of unprecedented pain and the switch would be almost impossible to manage convincingly. With its newest models in the RT line now over a year old, having been launched in July 1988, where - DEC launched its first generation MIPStations in January this year and has already come out with the second generation - IBM has lost the last shred of credibility it had in the Unix market, and it stretches credulity beyond breaking point to conceive of an IBM salesman pushing an RT at any prospect that might even possibly be persuaded to take an AS/400. The genie is out of the bottle, and no amount of malevolent machination in the Open Software Foundation can now get it corked back in again.

We'd like to hear from all of you out there with news and views about Unix for inclusion in these pages. In particular we welcome contributions to the new users column on page 9 of the expanded Unix News - now up to ten pages. Please send all articles, letters and other literature to the editor.

SOFTWARE NEWS

OPERATING SYSTEMS

Unisys Corp is hoping to make Convergent's CTOS/BTOS operating system more attractive to developers and OEM customers by merging the variants, adding Posix compliance and publishing a standard specification to turn it into an "open standard". CTOS/BTOS is claimed to number up to one million users worldwide. All other variants of CTOS including TNOS and Hero will also be incorporated into the new merged version, which will be a superset of existing products, and Unisys hopes to be beta testing the Posix-compliant version by year-end. It also plans to add a standardised development environment to the system, including a set of Unix-compliant utilities. Unisys also added 20 new software products for CTOS, including enhancements to its OFIS office automation software such as new spreadsheet and mail facilities, and added a series of communications products including TCP/IP, SNA, and X25 and X21 facilities.

AT&T has shipped a second version of its System V Release 4 source code, including code for Unix System V/386 Release 4.0, to members of Unix International. It also says it will no longer require binary run-time licensing fees for copies of the Open Look graphical user interface, included on the source code tapes.

Strongline Inc, Mountain View, California will soon be touting Wendin-DOS 2.5, "a multi-user, multi-tasking operating system" from the Spokane, Washington-based Wendin Inc that is claimed to be "highly compatible with PC-DOS and MS-DOS applications"; Strongline is also taking on PCVMS version 2.5, described as a self-bootable, multitasking, multi-user operating system that provides a VAX/VMS-style environment for MS-DOS machines, running "most" MS-DOS programs on the main console and including Wendin's Application Developer's Kit in the \$140 price; PCNX 2.5 offers the same facilities with a Unix-style user interface.

Sequent Computer Systems Inc has an agreement with Addamax Corp to develop high level security for Sequent's Symmetry line of parallel processors, which should allow the company to achieve a B1 security rating as specified by the Department of Defense Orange Book. Under the agreement, Sequent has licensed Addamax's B1st Trusted Unix conversion kit to develop the secure systems capability for Dynix, Sequent's implementation of Unix for its multiple Intel 80386-based line of systems.

COMMUNICATIONS

Network Computing Devices Inc has added support for DEC's DECnet communications protocols on its NCD16 X-Windows-based network display stations. The new capability, called NCDnet, allows NCD16 stations to access and display data on DEC VAX hosts running DECwindows under VMS or Ultrix, and allows the terminals to participate in a DECnet environment as a Phase IV end-node over Ethernet LANs or serial data links, and support a full range of DECnet facilities, including local name service, Mirror, and Data Access Protocol facilities. NCDnet support will be an optional extra, at \$200 per terminal. TCP/IP software remains standard. Meanwhile DEC is thought to be working on its own DECwindows X-terminal, likely to be a stripped down VAXstation costing around \$2,500.

Stratus Computer Inc, Marlboro, Massachusetts, has added an implementation of the DECnet communications software that will enable its XA2000 fault-tolerant supermicros to communicate with DEC VAX hosts. Stratus has gone to Technology Concepts Inc for the new DNS/2000 software, which is a version of the Sudbury, Massachusetts Bell Atlantic Corp subsidiary's existing DECnet-compatible CommUnity networking product, the Stratus implementation being done by New York-based system software developer Incotel Inc. Incotel rather than Stratus is to distribute the software, which will be available in September at prices ranging from \$17,500 on Stratus' XA2000 Models 50 and 70 to \$45,000 on the Models 150 and 160. Running under Stratus' VOS operating system, DNS/2000 will need the XA2000 systems to be attached to the local area network cable, which requires a Stratus Programmable Ethernet Adaptor, which is \$4,000.

DATABASES

Database developer Relational Technology Inc has boosted its UK CASE strategy with an agreement with Learmonth and Burchett Management Systems Plc to develop an integrated version of Ingres and the Learmonth Auto-Mate Plus product. The deal will enable Ingres to support the SSADM Structured Systems and Design Methodology, widely used in the UK where it is a now mandatory requirement for Government computer departments. Auto-Mate runs on MS-DOS micros and will normally be linked to an Ingres host system such as a DEC VAX or Unix system through DECnet or TCP/IP. It should be ready in October. Relational also supports Cadre Technologies Inc's Teamwork toolkit for those using Yourdon methodology.

Sequent is also working with Relational Technology Inc in a bid to boost performance of the Ingres database on Sequent hardware. The two companies have a joint development agreement which aims to achieve a ten-fold improvement in relational database query performance, by providing a "Parallel Database Query" facility to allow the processing of database queries to be spread over multiple processors.

IBM has announced that Oracle Corp's Oracle Version 6 relational database is now available under AIX Unix on the PS/2, with enhancements over the version originally announced. The transaction processing option includes a new concurrency control mechanism, the Row Lock Manager, with row level locking and row level multi-versioning. SQL*DBA, included in the database, is an interactive administration and performance analysis utility that can be used to manage local and remote nodes. AIX PS/2 1.1 one- to 16-user option, is required to support more than two Oracle users, and SQL*Plus, SQL*Forms, SQL*Menu and SQL*Net Transmission Control Protocol/Internet Protocol are separately charged. Oracle costs a one-time \$2,000 for one user, \$1,000 more to add up to seven users, \$3,000 more to go from nine to 16 users (that's \$6,000 for nine users or more). SQL*Plus on the same basis is \$500, \$250 and \$750; SQL*Forms, \$600, \$300 and \$900; SQL*Menu \$300, \$150 and \$450; SQL*Net TCP/IP \$700, \$350 and \$1,050; Pro*C is \$300, \$150 and \$450; and Pro*Fortran is \$300, \$150 and \$450. Oracle 6 for AIX PS/2 is shipping now.

TOOLS

The fact the company builds its Unix workstations around the Sun Microsystems Inc Sparc processor means that Solbourne Computer Inc, Longmont, Colorado can pick up all the software written for Sun workstations, and in a major step in that direction it has signed with Daisy-Cadnetix Inc, Mountain View, California for the latter to make its electronic design automation software available for use on Solbourne stations during the third quarter.

US engineering data management company Sherpa Corp has established its European headquarters at Bracknell in Berkshire. According to Dataquest, the engineering data management market is set to grow from £13m in 1986 to £281m by 1990. Sherpa plans to address this with its engineering tool DMS, the Design Management System. The company offers a Quickstart service which allows customers to install DMS on a small-scale, to then evaluate it and buy user licences as required. Quickstart costs around £40,000, and would normally take a minimum of two months to be up and running. Sherpa is aiming DMS at the computer, electronics, telecommunications and aerospace industries.

Metier is looking at Unix platforms for its Artemis 7000 project management software, launched for the DEC VAX nine months ago. The Unix version has been developed at the company's Ipswich-based research and development unit, and the first version is for Unisys 5000/85 and 5000/95 systems. Further releases are being planned for HP-UX, Xenix, SunOS, Ultrix and AIX, allowing Metier to run on HP, Sun, DEC and IBM Unix-based hardware. Based on Metier's Artemis 4GL, Artemis 7000 gives project, contract or manufacturing order information, with functions for planning and scheduling, cost control and resource management.

And Metier is to make its Artemis 8000 project management system available on the BBN parallel processor, (see page 3). The TC2000 runs Berkeley Unix 4.3 for software development concurrently with the pSOS+m kernel from Software Components Group Inc for multi-tasking execution. All the processors can share memory over the third-generation Butterfly switch at 38MHz per processor, and a software-controlled clustering option enables users to designate processor groups to run programs under either operating system simultaneously; there is also an Xtra X Window System-based programming environment has multiprocessing tools for development and to do performance analysis.

EMULATION

VMS emulation on DEC's Ultrix based RISC architecture is now available from Denver, Colorado based firm Accelr8 via its VMS Transparency Software package. The software comes with a command interpreter called Dcl8, providing VMS commands for Unix users, and Edt8, a text editor functionally equivalent to the VMS EDT editor, which includes entity based and Gold-Key editing. Libr8 is similar to the VMS Run-Time Library and System Service - claimed to enable quick porting of applications from VMS to Unix. Also included is the Accelr8 Network Suite, providing common remote functions through connectivity to a network, and Transl8, a conversion application for all text and binary data, allowing access to data between VAX and Unix systems. Rather than defeating the object of installing Unix based systems, the company says VMS Transparency Software is aimed at corporations which want to take advantage of the high performance of DECstations and integrate them with existing VAX systems, without the need for widespread retraining in Unix. The VMS emulation package is already available on Sun Microsystems, Silicon Graphics and MIPS Computer Systems Unix platforms.

INFORMATION RETRIEVAL

Mountain View, California-based Verity Inc has opened its first European sales and support office in London, and appointed distributors for its enhanced information retrieval system, Topic 2.0. The system runs under DEC's VAX/VMS, and under Unix on Sun Microsystems, Pyramid Technology and MIPS Computer Systems Inc machines, and under MS-DOS and supports all major networks. Verity plans to release Mac/OS, OS/2 and X Window versions in the next six to 18 months. The product is written in an object orientated query language, as opposed to structured query language, and lists the database under topics and sub-topics which the user defines and prioritises. Topic 2.0 supports real time systems, has hypertext facilities which retrieve text and images, and a topic by example query builder, which essentially adds to the system's intelligence. Its European distributors are Sherington Software Ltd of Redbourn, Hertfordshire, Net Support BV in Holland, and Belgian BIM SA. The company is targeting Topic 2.0 at large commercial organisations and government bodies, particularly those that are in process of majoring on Unix, and pricing on the stand-alone personal computer version starts at £500.

PROGRAMMING AND LANGUAGES

The British Standards Institution, is leading a project to develop the framework for a service which will validate C language translators against the requirements of the ISO/ANSI standard for C. The basis is a compiler validation suite from Plum Hall Inc, Cardiff, New Jersey, a training and consultancy firm specialising in C. Prices for the suite range from £1,500 to £6,000 depending on the system, and is configurable to test any compiler, from K&R and System V, up to the current draft of the ANSI C standard. The BSI is the sole European distributor for the suite, and furthermore says it will launch a Posix conformance testing service as soon as suitable test tools are available. BSI says it is currently beta-testing the NIST Posix conformance test suite, (PCTS), and intends to obtain accreditation as a testing laboratory for Posix FIPS 151.

But BSI claims that companies eagerly awaiting the publication of the ANSI C standard are likely to be disappointed because an appeal has been made to ANSI to reject the current C draft on the grounds that it is damaging to embedded system programmers. Formal publication of the standard is now not expected until December at the earliest - event though the current draft - X3J11/88-158 - is unlikely to be modified. As far as C++ is concerned, proposals for its standardisation have been put forward by Denmark and the USA, but BSI thinks it unlikely that this process will be carried out by the ANSI C committee, and is pushing for an international effort from the start. BSI would like to hear from anyone interested in participating in the C++ standardisation effort - contact Neil Martin, UK 908 220908 ext 2797.

The Masscomp side of the Concurrent Computer Corp house has introduced "the industry's first visual programming environment" for converting and tuning real-time Fortran VII programs for optimum performance on parallel processors. Called E/SP, for Environment for Sequential-to-Parallel processing uses interprocedural dependence analysis and methods that seek parallelism both inside and outside loops, and displays its internal structure in graphical form on a workstation screen so that a programmer can transform a sequential program to parallel form and then enhance the application for optimum real-time performance. E/SP for the Tinton Falls, New Jersey company's 5000 and 6000 families will cost from \$17,500, and the thing is due to go into beta test in the autumn. It also reportedly runs under Unix on the forthcoming Micro3200 machines.

DDC International of Denmark has signed a major new Ada contract with the Swedish Defence Ministry (FMV). The contract covers the development of a Symbolic Ada Debugger for Sun03 workstations, to be delivered by the end of the year. DDC recently completed work for the Swedish Defence on a Native Ada Compiler system for Sun-3 and 386i workstations, and signed its first Ada contract with FMV back in 1984.

Saber Software Inc of Cambridge, Massachusetts, claims that its Saber-C language programming environment will speed up the development of X Window applications as well as improving the quality of the results. Saber-C has a C interpreter, program checker, dynamic linker, code and data browsers, extensible debugger and graphical user interface, and sits within the Unix development toolkit. The tool will load files and libraries into the environment three times faster than the standard C compiler according to Saber, and an incremental linker then re-links only modified modules - particularly useful with X applications, as any toolkits and the Xlib library itself do not need to be re-linked each time a change is made. The debugger has also been customised to detect errors specific to X application and SunView development. Saber-C runs on Sun-3, Sun-4 and DEC VAX computers running Ultrix or BSD Unix, and can be used with ASCII terminals, Suntools or X Windows, with 8Mb memory.

OTHER SOFTWARE NEWS

Giving up altogether the pretence that it is nothing but a technical workstation, IBM has adopted version 2.0 of the Alis office automation system software from Applix Inc, Westborough, Massachusetts for the RT. Alis offers multi-font word processing that integrates text, spreadsheets, graphics, and database information into a compound document; networking facilities to provide electronic mail, diary management and shared filing; and a graphics editor that combines freestyle drawing with the ability to create business graphics.

Data General says it has secured agreements from fifteen software developers to port products over to the Motorola 88000-based Avion workstation range. The agreements include joint marketing agreements with five database and fourth generation language companies: Oracle Corp, Cybertek Software Inc, Informix Software Inc, Progress Software Corp and Relational Technology Inc. Other products include the MCBA Classic accounting package, Mathematica from Wolfram Research Inc, and various system software tools and languages, including the SoftPC DOS emulation software from Phoenix Technologies Ltd.

A new partnership between Bull HN Information Systems Ltd and the London based management consultancy group Deloitte Haskins & Sells, says it can help bring the UK's National Health Service out of what Mark Leaning of the Clinical Operational Research Unit at University College London has dubbed "the dark age in information technology." The partnership is offering two new software solutions claimed to address all the information requirements of the UK's health authorities, in the light of the government's recent White Paper on the future of the health service - "Working for Patients". On the basis of the paper and other research, Bull reckons that the healthcare sector will be the largest single buyer of information technology in the UK over the next few years. On offer is the RME Resource Management Environment and HIS Healthcare Information System, based on products from Canada, New Brunswick based software house Eversoft Ltd. They are already used extensively across Canada, and run under both Unix and Pick. The business end of the two packages combine an Oracle database with Case management software - CAMMS - and a fourth generation language. The RME package is intended to integrate of all of a hospital's disparate management, administration and resource allocation processes, its clinical and medical systems and related community based services - such as general practices - within one information system, designed to support the day to day operational needs of the organisation. The HIS software is designed primarily to address the special requirements of the clinical and medical sectors. It is also hoped that the development of health service computing will bring closer cooperation with the European Economic Community's Advanced Informatics in Medicine project, known as AIM.

USER'S VIEWPOINT :

SUN GETS TOP MARKS FROM ACADEMIA

After carrying out an evaluation of workstation and server architecture, London's Interdisciplinary Research Centre, IRC, has opted for a Sun based computing strategy, and is spending an initial £500,000 out of a £1.3m grant covering the purchase of computer systems over the next five years. The IRC is made up of various departments from the Imperial College of Technology, with other input from University College London. Apollo, IBM, Hewlett-Packard, Sun and DEC systems were all initially considered in the evaluation, but the final decision became a straight choice between the Sun Sparcstation 1 and the DECstation 3100, one each of which were installed for a test period. The two are similarly configured with 8Mb of memory, but there are a number of differences between them. Although the Sun machine is theoretically 10-15% slower than the DEC, it is roughly 10-20% cheaper according to the list price, it has an audio channel and can take a small 3.5" floppy drive which can read and write IBM-PC floppies. The IRC found the Sparcstation to be slightly more expandable than the DEC machine, having 3 slots for add-in cards - those currently available being a graphic accelerator, 2nd Ethernet controller and four serial lines. As well as looking at the two company's own performance figures for the machines, the IRC also conducted its own benchmarks running execution, compilation and problem solving tests on the two systems, and its own MicroVAX II, running VMS with 5Mb of memory.

Two stage execution benchmark, the first part being a long tree-traversing integer calculation, the second, the solving of the associated linear program:

System	Results (sec)	x MicroVAX II
Sparcstation 1	39	15.1
Decstation 3100	39	15.1
MicroVAX II VMS	589	1.0

Benchmark compiling and linking the associated source files for the above program - 5,337 lines of code - for each workstation one run was made at the default optimisation level, and one at the highest:

System	Results (sec)	x MicroVAX II
Sparcstation 1 highest	186	1.0
Sparcstation 1 default	70	2.7
Decstation 3100 highest	170	1.1
Decstation 3100 default	43	4.3
MicroVAX II VMS	187	1.0

Benchmark consisting of a large finite-element solver, the program is run twice with two different ways of calculating derivatives - the VAXStation 2000 is deemed to be equivalent to a MicroVAX II:

System	Results (sec)	x MicroVAX II
Sparcstation 1	30.7	11.9
Decstation 3100	21.1	17.3
IBM 6150 (f77)	154	2.4
Vaxstation 2000 VMS	365	1.0

System	Results (sec)	x MicroVAX II
Sparcstation 1	9.5	9.4
Decstation 3100	7.4	12.0
IBM 6150 (f77)	37	2.4
Vaxstation 2000 VMS	89	1.0

Based upon these and other findings, the IRC is buying 29 Sun Sparcstations, two Sun 4/390 servers, one DECserver, seven DECstations, a MicroVAX 3400, some PCs, Apple Macintoshes and other peripherals and software. Approval for the acquisitions took 18 months, but the delay meant that the workstations finally purchased are actually four to five times more powerful than those originally applied for by the IRC due to advances in workstation technology. Existing DEC systems and a Sun-3 network are to be sold - the IRC regards the support of both Sun-3 and Sun-4 systems as too problematic. Phase two, and the rest of the spending, will take place over the next couple of years.

Language Processors Inc, Framlingham, Massachusetts, has unveiled a version of its Fortran compiler to run on **Sun Microsystems Inc**'s 386i workstation - the compiler now runs on the complete range of Sun hardware - it costs \$1,000 on the 386i, and is available now.

Alslys Ltd, Henley-on-Thames, Oxfordshire, is set to release its Ada Tune tool with the next major release of its Ada compilers later this year. It will be offered as an optional extra on its other compiler suites - first on the range of Motorola 68000 based Unix workstations, then on Intel 80386 and DOS machines.

Microway (Europe) Ltd of Kingston-upon-Thames, Surrey has a new maths co-processor which is object code and plug compatible with the 80287, but includes 387 instructions and enhancements: the 2C87, from **Integrated Information Technology**, comes either as a single chip or a daughterboard with chip and crystal oscillator running at 20MHz; the 2C87 10MHz version costs £200, and the 20MHz daughterboard is £265.

Ardent Computer Corp, Sunnyvale, California reduced by up to 30% the prices of its current Titan family of graphics supercomputers in a prelude to the introduction this autumn of a broad new line of systems: the Titan, originally \$79,000, is now some 39% cheaper at \$55,300.

The **European Unix systems User Group** is to hold its Autumn '89 conference and exhibition at the Vienna Wirtschaftsuniversitat between September 18 and 22nd: it will include a series of tutorials on such subjects as Unix network programming, RISC, The Andrew Toolkit and the future development of Berkeley Unix on the first two days, followed by a full three day technical programme. ● **Torch Technology Ltd** of Cambridge has signed a contract with **Addons Ltd**, a Southampton-based computer distributor: Addons currently sells PCs to commercial and educational establishments through a network of 1,000 dealers, and will initially take £300,000 worth of Torch's Unix-based QS range, with more orders expected in the coming months. ● **Integraph** has announced three new ports to its Clipper workstations: **WordPerfect** now runs on these Unix based systems, as does **CLM Systems Inc**'s Civil Engineering Automation Library and the American Association of State Highway and Transportation Officials' Interactive Graphics Roadway Design System: the company also announced an Ada compiler developed by the University of York's York Software arm at the recent European Unix User Show. ● **Graphic Software Systems Inc** of Beaverton, Oregon has a new version of its PC-Xview DOS-based X-Windows terminal emulator; release 1.1 now supports 3Com and Western Digital Ethernet boards as well as the originally supported Excelan board - multiple boards are supported through device drive software developed by **FTP Software Inc**: price is \$295 or \$425 with the FTP software. ● **And Locus Computing Corp**, which has recently set up UK offices in Aylesbury, Bucks, is releasing its Integrator's Platform range of software to the UK, including PC-Interface and the Xsight for Unix 386-based PCs. ● **Silicon Graphics** has been shrugging off question marks over the future of the 20% of its shares owned by **Control Data Corp** - which is hurriedly selling off all the family silver - Silicon Graphics has formed new subsidiaries in Belgium and Norway and added offices in France and the UK. ● **Apple** is selling its stake in PostScript developer **Adobe Systems Inc** - Apple is developing its own alternative interpreter for the PostScript page description language - new products are expected in the middle of next year. ● **Integrated circuit design software developer Silicon Compiler Systems**, San Jose, California is to acquire **Descartes Automation Systems Inc** of nearby Santa Clara, which specialises in layout products for applications-specific integrated circuits. ● **Advanced Micro Devices Inc**, Sunnyvale, California is mobilising local area network product developers and vendors to join its new Advanced Networking Group, which has the mission to promote acceptance and implementation of the new, high-speed Fibre Distributed Data Interface for 100Mbit-per-second local area networks.

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Manchester-based **Logitek Plc** is to acquire the **Advansys** group of companies for just over £10m - the companies within the Advansys group are probably better known than the holding company itself and they include the accounting software house **CSM**, the hardware and software distributor **CSM Systems**, and **Novell** distributor **Azlan**.

The **88open Consortium**, Wilsonville, Oregon, which now consists of some 51 supporters of Motorola's 88000 Risc chipset, has appointed its first European Director, responsible for strategic marketing decisions in Western Europe: **Martin Ward**, ex **Zilog UK** and **EMS Ltd**, will work from London to foster 88000 development programs, expand membership, and work with independent software vendors to increase the chip's application software base.

The **SAS Institute's** data management, analysis and presentation software - **SAS System** - has been ported to DEC's new RISC based **Ultrix** platform and the new **VAX 6000 Model 400**, DECwindows versions of which will be available for both: the Ultrix offering is set to be on the shelf by the middle of next year, and the **VAX 6000 Model 400** version will be out when the machine begins shipping later this year - the software will also include support for DEC's vector processor which is under development for the **Model 400** when it arrives.

Alliant Computer Systems Corp has teamed up with **MathWorks Inc** of South Natick, Massachusetts for a parallel processing version of the **Matlab** software package for the **Alliant FX-Series** and **Visualisation Series** supercomputers: **Matlab** combines numerical analysis, signal processing and two dimensional and three dimensional graphics with an interface in which problems and solutions are expressed in standard math notation, enabling scientists and engineers to perform numeric computations for applied mathematics, signal processing, control system design and other applications; it's out now.

Digital Research Inc of Monterey, California has announced that it is now shipping release 2.1 of its **FlexOS** multitasking operating system, which adds support for **X/GEM**, the multitasking graphics interface system that integrates the **GEM** graphics environment manager with **X Window**; the 32-bit protected-mode operating system runs on 80186, 80286 or 80386 processors and the new release also supports **CGA**, **EGA**, **VGA** and **Hercules** graphics adaptors.

ParcPlace Systems, of Mountain View California, has launched its **Objectworks** software development system for **AT&T's C++ Release 2.0**: the integrated set of object-oriented tools include an incremental compiler and linker, source level debugger and source code browsing, and will be available in late August for the **Sun-3** workstation priced at \$2,495.

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