UNIX® NEWS

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TANDEM ADOPTS MAJORITY VOTING IN NEW MIPS-BASED INTEGRITY S2 MACHINES

Rather than compromise the Unix System V kernel and thus the portability of Unix applications, Tandem Computers Inc has gone back to first principles in designing its new Integrity S2 fault-tolerant Unix system. In contrast to its proprietary NonStop systems, the three processor S2, built around the 16.7 MIPS Computer Systems Inc R2000 RISC but designed to move up with the R-series family, uses the voting system of fault-tolerance, where a comparator examines the results produced by the three processors. If a result from one differs from that from the other two, the latter are assumed to be correct, and the former is switched out. Diagnostic tests are run and if a fault is detected, alerts are given, if not, the error is assumed to have been a soft one and the processor is switched back in again. The S2 has duplicated memory and mirror disks, dual power system and dual-ported input-output subsystem. It is built around a proprietary fault-tolerant NonStop V+ bus compatible with the VMEbus: the bus interface module provides VMEbus controllers with paths to two separate NonStop V+ buses. The NonStop-UX operating system is based on System V.3, conforms to the System V Interface Definition, with added system recovery mechanisms, the Berkeley Fast File System and a memory management system designed to minimise memory-to-memory copies and maximise use of high-speed local memory. Tandem offers the X Window System, Network File System and TCP/IP and has adopted Oracle, Ingres and Informix relational databases. S201, 202 and 204 configurations come with a 16-port asynchronous controller, S211, 212 and 214 come with Ethernet controllers. The S201 and S221 with duplicated 16Mb main memory, two 295Mb disks and a quarter inch tape drive cost from $172,000. The S202 and 212 take up to 40Mb memory and add a Mass Storage Cabinet with two more 295Mb disks at from £196,000; the S204 and 214 have SCSI channels for up to four disk cabinets and start at $248,000.

IBM LAUNCHES 80486-BASED PS/2 70-486

Having been stymied on its plans to get an 80486 offering into the market ahead of Compaq Computer when bugs in the Intel chip forced it to hold its replacement processor board for the PS/2 Model 70, IBM has come out with the Real Thing in the shape of the PS/2 70-486. It sounds as if it's little more than a Model 70 with the 486/25 Power Platform factory-installed, because IBM says that a 70-386 can be upgraded to the new model by swapping the processor board for the Power Platform. The 70-486 has a 25MHz 80486 processor and comes with 2Mb memory expandable to 8Mb, 1.44Mb floppy, 60Mb or 120Mb disk, serial, parallel, VGA, mouse and keyboard ports, one 16-bit and two 32-bit slots and keyboard, at $12,390 with the 60Mb, $13,000 with the 120Mb disk. The new machine is offered with OS/2 and MS-DOS 3.3 and 4.0, and AIX Unix is promised for the first quarter.

NEW STARDENT BOXES TO USE INTEL's i860 ALONGSIDE MIPS CHIP

Stardent Computer Inc - the result of the merger of rival graphics supercomputer vendors Ardent Computer and Stellar Inc - is planning an assault on the mainstream workstation market with new low-end graphics products due for introduction by the middle of the year. The new mid-range systems will incorporate Intel technology, including the i860 processor, to be used as a vector processing unit alongside a Mips Risc chip for scalar processing. Systems will offer the same level of performance as the 3000 - 128 MIPS and 192 MFLOPS in top-end, four processor configurations - for "a third to half price", and new systems with twice the performance for the same price in 1990. The Stardent line now consists of the 1000 Series (previously Stellar's GS1000), 1500 (Ardent's Titan 2), and the 2000 and 2500 Series (previously the GS2000 and GS2500 from Stellar).

NOW XEROX SUES APPLE OVER GRAPHICAL USER INTERFACES

Xerox Corp warned back in May that it intended to protect its copyrights in the user interface it developed for the original mouse-and-icon computer, the Xerox Star, when it announced that Metaphor Computer Systems Inc had signed to license its screen displays - but observers were still stunned when just before Christmas it slapped in a lawsuit against Apple Computer Inc demanding $100m in royalties paid by others to Apple that it claims rightly belong to Xerox, and $50m in damage to its business by the continued marketing of systems infringing its copyrights. The suit covers the user interfaces of the Lisa and all Macintosh computers, and throws into confusion the suit still going through the courts that Apple brought against Hewlett-Packard Co and Microsoft Corp over the same issue, directed specifically at Hewlett's NewWave and Microsoft's Presentation Manager. It is widely questioned whether the Xerox suit will be successful, coming as it does six years after the Lisa was introduced in 1983, and it could also stand or fall on whether there was a C in a circle on the screen displays of the Star computer. If it is successful, few developers of systems with iconic user interfaces would be immune from demands for royalties from Xerox - but while the Open Software Foundation's Motif would be exposed, the rival Open Look from Unix International Inc would be home free because Sun Microsystems, which designed it, has signed a technology sharing agreement with Xerox.

DOLPHIN LICENSES 88000 TO DO 1,000 MIPS ECL SERVER

The new Dolphin Server Technology A/S subsidiary of Norsk Data A/S has licensed the instruction set of Motorola Inc 88000 RISC microprocessor, and the accompanying diagnostic and verification software to design a compatible processor in ECL using closed circuit liquid cooling, and claims that the Orion system it is developing will be clocked at 125MHz and be able to execute eight 88000 instructions in parallel to deliver 1,000 MIPS - with prices starting at $500,000. Dolphin's aim is to deliver mainframe performance at the vastly better price-performance now enjoyed only by workstation and PC users. Motorola is looking at implementing some of Dolphin's technology in future versions of the 88000. The Orion will achieve 1,000 MIPS only with optimising software; without, it is expected to deliver between 300 to 400 MIPS. It will have a hierarchical bus structure with Scalable Coherent Interface, Futurebus+ and VME, and use 88000s for the input-output.

SHOWCASE - FOCUS ON THE FAR EAST

JAPAN'S FIVE YEAR SIGMA SYSTEM DUE FOR COMPLETION NEXT APRIL

Geoff Conrad reports from Singapore

This April, users will be able to buy the results of Japan's five-year Sigma project - a range of workstations running a standard set of integrated software development tools. According to Noboru Akima, the project planning manager, the 193 cooperating companies in the project not only agreed on all the aims and specifications, but produced the hardware and software (now in the final stages of testing) on budget and on time. (After five years of close cooperation, 193 Western computer companies would be knee-deep in blood and the survivors would not agree on anything). Speaking at the Singapore Unix Association's recent Unix Asia '89 Conference, Akima said that a new company would be formed before next April to support, modify and enhance the system, while the project will continue to work to extend the coverage of the system interface and "efforts will be considered towards the common system interface of wider applications."

V.4 standardisation

Recently the Japanese Information Technology Promotion Agency, which runs the project for the Ministry of International Trade and Industry, announced that it will standardise on AT&T's Unix System V.4 rather than the still-nebulous rival OSF/1 Unix from the Open Software Foundation (UX No 260). Akima confirmed that the System V Interface Definition was chosen because "it is very important and inevitable... to establish the common interface which will be observed by the industry... for the virtue of users and vendors, both domestic and overseas, and to promote the international mutual use of software/hardware products." The Sigma project has developed its own Japan specific and Japanese language interfaces and requirements. But, according to Akima, the international conventions for multibyte code and character handling "tend to cover the wider specification." If the Japanese language options are made available internationally, it should make it easier for foreign software developers to move into the Japanese market, but in the past MITI has never done anything to make the penetration of the Japanese market easier for foreigners!

Sigma software

The project drew up hardware specifications for the workstations and developed handling and windowing interfaces. The hardware manufacturers produced all this, with Sigma producing a test suit to check that they complied with the specifications. This is why "Sigma workstations" have been available from some of the manufacturers for some time, although the Sigma software will not be available until next April. The project has developed a core of about 50 software tools which will be available on every workstation, while various software platforms have developed a number of hardware specific tools to run on the different platforms that will be sold by the 10 manufacturers. Also, about 30 software vendors will market their own Sigma software to run on the platforms.

JAPAN TURNS OUT IN FORCE TO ENDORSE THE NEW MERGED SYSTEM V.4 VERSION OF UNIX

At the Japanese launch of Unix System V.4 - an event hosted by Unix International Inc at the New Otani Hotel in Tokyo earlier this month, Japanese members of the AT&T Unix fan club scrambled to endorse the new release and vied with each other to declare their long-standing Unix credentials, Anita Byrnes reports from Tokyo. Tadeo Higashaki, managing director of Oki Electric Industrial Co, welcomed the manner in which input was being invited, and said his Oki hoped to contribute real-time and transaction processing extensions to V.4. A senior vice-president from Toshiba Corp claimed that his firm was one of the first to ship Unix System III, back in 1982, and said the combination in V.4 was particularly gratifying because Toshiba supported both Berkeley and System V Unix. Similarly enthusiastic noises came from Fujitsu Ltd, Fuji Xerox Co and Sun Microsystems, and NEC Corp boasted that it was the only Japanese beta test site for V.4, and highlighted its loyal support, showing up at both Unix Expo in New York and the Tokyo Unix Fair this month. Larry Dooling, president of AT&T Unix Software Operation, acknowledged that the unit was considering broadening its ownership, stressing that Unix International members would have priority.

Week of Unix events

The Asia-Pacific Unix International organisation has 38 members, including four universities and majors such as Oki, Ascii, Astec, Toshiba, Prime Computer Japan, Nippon Steel, Omron Tateishi, Nippon NCR, Nippon Sun, NEC, Nippon Unisys, Fuji Xerox, Nippon Data General, Matsushita Electric, Yokogawa Hewlett-Packard - bit of a surprise, that, since Hewlett in the US was an Open Software Foundation founder - and Fujitsu. Yumio Imamura from Fujitsu is general manager of Unix International AsiaPacific Operation. The launch heralded the start of a week of Unix events - a seminar on Unix standardisation, attended by more than 1,000 participants from industry. The annual Unix Fair, sponsored by the Japan Unix Society, followed the System V.4 launch and was bigger and better this year, with a total of 63 exhibitors, including our cousin paper Nippon Unigram. Stands that attracted particular interest from visitors included Marubeni Electronics, exhibiting the Firex 9000 System, a networking optical file server; and the joint MIPS-Kubota Computer stand where the new ECL RISC machine was being displayed. MIPS Computer Systems Inc vice-president of systems technology John Mashey noted that MIPS saw itself as "part systems vendor like Sun, part technology developer and licensor like Intel", and suggested the "the way to work in Japan and elsewhere was through partnerships" - such as its ones with Sony Corp and Kubota. Tomen Electronics showed IXI Ltd's X.desktop running in Japanese, a source of some competitive advantage, since no other company was able to run a comparable environment in Japanese. International Sekisui AI Corp, the distributor for the S language statistical analysis and graphics product, showed it running on Sony's News workstation, and revealed that it is developing a News version of the Nexpert artificial intelligence tool. And Altos Computer Systems Inc was at the show, preparing to have a new crack at the Japanese market: its initial foray through a Kobelco Systems, a Kobe Steel subsidiary, was not a success and it has now signed trading company Shinsho Corp - also a Kobe Steel affiliate - as a distributor: Shinsho is positioning the Altos boxes as office servers and departmental systems designed to be connected to a mainframe through an SNA/Fujitsu Network Architecture gateway - but Altos confided at the show that in the long term, it wants a strategic partnership for the Japanese market.

HARDWARE NEWS

RISCY BUSINESS

With most of its bigger design wins having come from companies that have fallen on hard times and are looking to RISC and Unix to return them to prosperity, Motorola Inc is having to pull all the stops out to broaden the base of companies designing for its 88000 RISC microprocessor. To make the family more attractive, it has launched a low-cost 16MHz version of the part and cut the price of the faster members of the family. Motorola rates the 16MHz version of the 88100 CPU at 13.6 MIPS and is offering it at $148 a time in 1,000-up quantities; the 20MHz version is cut 29% to $494, the 25MHz version falls 30% to $488 and the top-end 33MHz version falls 27% to $652, for 1,000-up in each case. The 88200 cache memory management unit costs $175; the other versions are cut by the same percentages as the CPUs to $437, $612 and $855 when you buy 1,000 or more. Motorola is having to make a major effort in the RISC market because several of the biggest 68020 and 68030 users - Sun Microsystems, Hewlett-Packard Co and Apollo Computer Inc to name three - have already opted for their own RISCs, and its most prominent Japanese user, Sony Corp, has opted to move to the MIPS Computer Systems Inc RISC family.

And Motorola's Tempe, Arizona-based Microcomputer Division has introduced a new entry-level addition to its Delta 88000 Risc series. The Model 8408 with 17 MIPS performance runs at 20MHz, comes with 8Mb memory, six add-on slots and supports up to 64 users. Available with 600Mb or 300Mb storage capacity prices are $26,685 and $23,935 respectively. Previous bottom-end machine in the series was the Model 8608 at $27,935.

Hewlett-Packard Co's announcement this month is expected to include computers and servers built around a new CMOS implementation of the company's Precision Architecture RISC processor - the present version is fabricated in NMOS. A 48MHz version of the part delivering up to 30 MIPS performance, is expected to be used in a new top-end HP3000 Series 970: although initially offered as a uniprocessor, the new model is expected to be offered with up to four processors in due course, with support for over 400 users. At the low end, an HP3000 Series 915 is expected to support 16 or so users and to start at $11,000. Systems and servers in the HP9000 Unix family are also expected, and there is talk of an HP9000 Series 600 family, although it is not clear whether this will use the RISC or the upcoming Motorola 68040.

As hinted back in May, (UN No 3), Copenhagen-based Unix super minimaker Dansk Data Elektronik AS is launching a Mips Computer Systems Risc option for its unusual multi-CPU Supermax Cisc series that first appeared way back in 1984. From April next year, the top-end Supermax model will take up to eight CPUs that can be any combination of 20MHz or 25MHz Mips R3000, 25MHz or 33MHz Motorola 68030, and 20MHz Motorola 68020 processors. A full complement is claimed to deliver 150 MIPS performance - or around three times the processing power of the previous top-end configuration. Memory goes from 4Mb up to a total of 256Mb per CPU with the addition of 16Mb expansion boards. As well as running Unix V.3 - V.4 is expected during the course of next year - software, like the hardware, is interchangeable - the Supermax will run applications written for both the Mips and Motorola 680X0 ranges, as well as the transaction processing version 6.0 of Oracle's relational database. Across the four models in the series disk capacity runs from 85Mb up to 15Gb, and the top-end Rack and Vertikal options will support up to 256 users. Prices start at around £70,000 and go up to £1m.

NEWS ROUNDUP

The last decade of the millenium is upon us, and the peace-making processes which have dominated the world's political stage over the past year look to have set an example for the Unix industry to follow. Discussions around the fate of **AT&T's Unix Software Operation** - which now looks likely to be sold off to companies interested in acquiring a stake - will mark the end of the **Unix International/Open Software Foundation** conflict that dominated the industry in during 1989. The talks have advanced to a point where they are now concentrating on just how much **USO** is actually worth. The problem is that no-one knows how to assess its value. **AT&T** has let it be known that it has not made a profit out of its Unix software activities, and royalty revenues are currently low, at about $50m annually. Comparing **USO** with companies such as **Adobe Systems** or **Microsoft Corp, USO** would have a market value of around $200m, despite its lack of profits. The true worth of **USO**, however, would be more sensibly valued by its strategic importance to the interested companies, which apparently include **Hewlett-Packard** and **DEC**. That strategic value would presumably increase following a cessation of hostilities between **UI** and **OSF**.

The consortium of vendors submitting to the **Open Software Foundation's** distributed computing request for technology that includes **IBM** and **Transarch Corp**, is now ready to talk, and held analysts meetings early in the new year under the title DEcorum. Using the IBM-backed Andrew File System commercially enhanced by **Transarch Corp** of Pittsburg, the submission also includes contributions from **Apollo/Hewlett-Packard** (Network Computing System) **Microsoft Corp** (Lan Manager for Unix) and **Locus**, and at the last minute the architecture was endorsed by **DEC**, amongst other vendors.

New year bounty - **AT&T** has won a further major contract from the US Federal Government, following on from its $4.5 billion Air Force contract won at the end of 1988. The new contract, Office Automation Technology and Services, known as OATS, is reckoned to be worth up to $850m over the next eight years. Together with up to 50,000 Intel-based networked computers, core software will be a new office automation package called Conquistador using the Open Look graphical user interface. And **Data General** has won its first major open systems contract for its Motorola 88000-based AViiON Risc systems. The US Interior Department's water resources division has ordered $127m worth of the kit over seven years.

ICL's new generation of SPARC machines - codenamed Unicorn - are now waiting in the wings and will be launched before the month is out. The machines, which will come in at the top of ICL's DRS line, have been out at beta customer sites for some months now, and are expected to use 25MHz and 33MHz SPARC's rated at 15.5 and 23 MIPS.

Harris Corp, which launched its Night Hawk real-time Unix computer family in Europe in September, promising that it would come out with the first models in the line to use the Motorola 88000 RISC before the end of 1989, (UN No 8), has been as good as its word. The Night Hawk 4000, which is rated at 20 MIPS, is being pitched at major real-time applications such as aerospace simulation including training simulators, at signal processing, and at military command, control, communications and intelligence applications. The machine comes with 4M-bit dynamic RAMs for peak transfer rates of 100Mbytes-per-second, and up to 144Mb of main memory is supported. Operating systems offered on the Night Hawk 4000 include CX/RT, which offers a frequency-based schedule, performance monitor and data decoding; the CX/UX Unix-based system that supports both System V and Berkeley BSD services; and CX/SX for developing applications in a secure environment - but the key feature of the machine is that all three environments are object-and file-compatible and can reside on the same disk. It supports Ethernet, Network Field System and X25 and has real-time interfaces to Mil-Std-1553B, Encore HSD and DEC DRIIW; it also supports the new Harris Nigh Hawk GS-1 VME graphics subsystem. The Night Hawk 4000 system nucleus with one CPU, eight VME slots and CX/RT operating system is £48,400 with 4Mb will be available in third quarter 1990, and the 16Mb version, £61,000 follows in fourth quarter.

Siemens has now fully incorporated the French IN2 computer systems business it acquired in January of last year into its operation, and is set to reveal a £2m deal for IN2's range of Pick systems in the UK at the beginning of February. In France, IN2's rebadged Mips Computer Systems' kit has been available for some time as the IN 6000 Series, but there are no plans to introduce them into the UK. However Motorola 68020 and 68030-based IN 4000 and IN 8000 ranges - respectively low-end and top-end machines - will be launched in the UK at the end of this month and the beginning of February, running the Pick operating system. New IN2 Unix boxes will be revealed in the third quarter, but its Intel-based PCs are unlikely to be seen in the UK before the end of the year according to Siemens' IN2 product manager in the UK M.Pavlowski. Siemens' MX and Sinix ranges are built around National Semiconductor processors - the top-end MX 500/70 and /80s are re-badged Sequent Symmetry parallel processing systems. Siemens pays for Sequent to rebuild the boards around the Nat Semi 32532 chip rather than the the Intel 80386 it ordinarily uses - the West German firm puts the boards into boxes, which run Sequent's Dynix unixalike operating system. Siemens is also thought to be working with the 80386 with an eye to the introduction of a parallel line of Intel-based systems, though it claims the large European customer base for the current machines make discontinuation of the Nat Semi-based line unlikely.

Artificial intelligence techniques and technology still generate much more excitement in Japan than in the US or Europe, and Nippon Steel Corp has put together a factory computing complex using Symbolics Inc's Ivory Lisp microprocessor, coupled with a RISC from MIPS Computer Systems Inc and multiple Intel 80386 CPUs. The system is designed for real-time data collection and analysis, trouble-shooting and producing production schedules. With Ivory chip, R2000 RISC and four 80386s, it costs $240,000.

With its efforts to become a Sparc clonemaker stymied earlier this year by the withdrawal of Phoenix Technologies from the Unix BIOS business (UN No 7), US start-up Mission Cyrus must now decide whether to get a SunOS license direct from Sun (a la Solbourne) or to go to Interactive Systems in the hope of greater added-value for its projected range of Sparc systems, originally expected to appear by the end of this year. Despite the setbacks, Mission is still keen to become a Sparcette, and hopes to have a decision early next year: both firms have approached it for the business. In the meantime, Mission is running Interactive's 386/IX on its innovative new 386 MCA portable, the Darius ProPortable, which supports a 200Mb hard drive and a 120Mb tape backup. The 20-lb ProPortable features a built-in ink jet printer and gas plasma VGA screen. Unix is also available on Mission's 386 Darius file server (oddly subtitled CentralNtelligence), and will be on its 25MHz 486 version once it becomes available next year, sporting fault tolerance and a basic 8Mb memory, plus a 256Kb cache. For the graphical user interface, Mission has chosen OSF Motif and Looking Glass from Visix. Mission Cyrus, whose UK-based parent company Mission Electronics has made a name for itself in top-of-the-range stereo systems, and whose sister firm Mission Technologies plc has been building and supplying PCs in Europe for the last few years, intends to distribute its machines in the States solely through dealers, targeting 10-15% of IBM's top resellers as potential recruits. Unusually, Mission will offer to support the end-user directly.

AT THE TOP END

Cray Research Inc plans to add an entry-level version of the Y-MP by the middle of next year to sell for about $2m against the $5m current entry price to the Cray line. The company is also expected to extend its line below the $1m mark to compete with Convex Computer Corp, likely to use bought-in technology, but that is not expected to be ready until later and Cray hopes to begin delivery of its high-end C-90 supercomputer by 1992. While others are challenging Cray's dominance in the supercomputing field, Cray continues to have the technological advantage - NEC Corp provided the only competition for the European Centre for Mid-range Weather Forecasting and was beaten by Cray: the Japanese system won't even be available until end-1990.

A new, massively parallel computer system with up to 16,384 custom processors, delivering 10,000 MIPS performance and controlled by a 14 MIPS-rated Risc chip is to be announced in January by MasPar Computer, a Sunnyvale, California-based company founded last year by ex-DEC vice president Jeffery Kalb. Known as the MP-1 it is to be front-ended by VAXstation 3520s running Ultrix - chosen for its multi-processing capabilities - as part of an OEM deal signed with DEC, reckoned to be worth up to $1m in the first year. Other workstations or even X-terminals can also be used. The monster machine is aimed at computational chemistry, fluid dynamics, computer aided engineering and image and signal processing. With input-output capability tagged at 1Gb per second the MP-1 will support high-speed networks such as Fibre Distributed Digital Interface and High Speed Channel, and MasPar is currently understood to be working with Ultra Network Technologies to develop a version of UltraNet for the machine. TCP/IP and X-Windows will be supported, and the first software will be existing Ultrix applications that MasPar is configuring for the MP-1's single instruction multiple data architecture. The MP-1 uses custom VLSI chips, each with 32 processors attached. A top-end MP-1 will come in at around $250,000.

IBM's RIOS MACHINE - AN UPDATE

With the frightening speed of events nowadays in the Unix industry, all that we can hope to offer subscribers is a snapshot of the industry that was correct at the time of publishing - but snapshots fade like old Polaroid film, and so we now have to report the IBM's promised RIOS workstation, which was to have made its debut at the UniForum trade show in Washington this month, has again been delayed, and is now unlikely to see the official light of day until towards the end of February - probably! The alleged delays on IBM's successor to the RT Unix workstation are commonly attributed to a number of factors, including continuing and fairly serious bugs in the AIX operating system and compiler that have caused difficulties for software developers, and also to the inevitable internal arguments over pricing and distribution. But one of the reasons may simply be that pulling a system like Rios together is very hard. Observers are expecting its AIX 3 operating system to have impressive capabilities such as mirrored disk partitioning not found in AT&T's Unix System V.4. However, industry watchers such as UBS Securities VP Marc Schulman are dubious that IBM will add the multi-processing expected in some quarters much before 1991, because of the negative impact such power could have on IBM's bigger boxes. In that regard, some feel that IBM could be postponing Rios to buy more time for assessing the immediate impact it will have on items like the AS/400. Another reason for the delay is thought to be a lack of applications software. Unusually, IBM appears to be paying out large sums of money to software developers in a move to encourage applications porting to Unix, and not only for the new RIOS box: Alsys Inc, for instance, has reportedly been funded by IBM to the tune of $1m to develop an Ada release for AIX/370, without receiving any sales rights to the resulting product.

CHIP TECHNOLOGY

Intel Corp says that it has resumed shipments of the 80486 microprocessor after a month's hiatus while it fixed the bug in the chip's floating point processor. Not all customers have yet received good parts, but the company says it is still on target to ship tens of thousands of 80486s by the end of the year. Customers are being offered replacement parts on a one-for-one basis, and the previous version is still available for prototyping and evaluation because the vast majority of applications will never fall foul of the bug.

Vitesse Semiconductor Corp of Camarillo, California has upped the ante in the Gallium Arsenide stakes with a 30,000-gate GaAs array that brings the technology right down into the realm of RISC microprocessors - the original implementation of the Sun Microsystems Sparc took only 20,000 gates. The VSC30K is aimed at high-speed computer, telecommunication and defence applications, and can be used in air-cooled systems, the company claims. The new part features 30,528 2-input NOR gates with 100% gate usage and typical power dissipation for the device is 8W to 12W. It comes in a 344-pin leaded chip carrier, with 256 signal pins configurable to ECL, TTL and GaAs input-output levels. Vitesse currently has over 20 VSC30K designs in progress and new design inputs are being accepted now: prototype shipments are set for January 1990. All members of the Fury gate arrays are included in the second source pact announced with Fujitsu Ltd last month.

OTHER NEWS

Megatek Corp, San Diego, California, which takes Sun Microsystems workstations OEM and revamps their graphics capabilities, has a new X-Windows development environment for the Sun-3 and Sun-4 supporting Open Look, and the XView toolkit. The X-ccelerator VME board uses a Texas Instruments 34020 graphics chip as a co-processor for the X server, executing on either the Sun-3's Motorola 60303 or Sun-4's Sparc CPU. This allows graphics functions to be significantly speeded up, whilst reducing the load on the CPU. Each board comes with up to 7Mb memory - to which an extra 4Mb can be added - and supports an additional keyboard and mouse on the workstation. Multiple X-ccelerator boards can be configured in a single system, price is £4,000 each. Megatek has UK offices in Basingstoke, Hampshire.

Sequent Computer Systems Inc is set to extend the architecture of its Intel 80386-based multiprocessors with the first uniprocessor in the history of the Beaverton, Oregon company. An entry-level 80386 Unix box in its Symmetry line, running the Dynix implementation of Unix, is to be announced this month, with shipments set for the first quarter. Prices will start at about $40,000 against the $90,000 or so base price for the bottom-end two-processor Symmetry, which can grow to 10 processors and are designed for intensive transaction work.

UNIX IN 1989

RISC with everything. Prosperous desktop business and high performance shake out.

January: After months of pressure from the industry, AT&T chose the start of the year to begin the process of distancing its Unix development activities from its commercial computing business, spinning out the operating system into the charge of a new division, the Unix Software Operation. Meanwhile in the opposing camp, the Open Software Foundation was flourishing, and made its final choice of technologies for its Motif graphical user interface, choosing a combination of the submissions from DEC and Hewlett-Packard. Visix Software Inc introduced the Looking Glass user interface manager, set to clash head on with X.desktop from UK rivals IXI. DEC confirmed its increasingly serious Unix aspirations by launching a new line of non-VAX workstations running Ultrix and using the Mips RISC processor. And young workstation pretender Solbourne Computer Inc threw down a challenge to Sun Microsystems with the first SPARC-based systems outside of Sun's own. Another start-up, Network Computing Devices, came out with early examples of a new class of intelligent terminal based on the X-Window system and dubbed X-Stations - many more were to follow throughout the year. Prime Computer Inc was still battling against a takeover bid from MAI Basic Four, while UK Unix house Sphinx Ltd was reported to be up for sale.

February: AT&T had to work hard to regain industry confidence in its future plans for Unix after the Open Software Foundation was formed in 1988, and this month 46 of its supporters formally announced Unix International, to plot the future course of Unix in conjunction with the Unix Software Operation. By now, Mips Computer Systems was on a roll that was to last all year, introducing new systems, signing up Siemens and NEC to fabricate its Risc processors, and signing up Sony Corp to use its chip in the face of competition from Motorola's 88000 and Sun's Sparc. After handing Xenix to the Santa Cruz Operation a couple of years ago, Microsoft bought back into the Unix business by acquiring a substantial stake in the company. Pyramid Corp revealed its challenge to the mainframe market with a multi-processor system rated at 140 MIPS running Unix, whilst Amdahl released version 2 of its Unix-compatible UTS operating system. Unisys continued its spending spree by signing a $250m OEM deal with Sequent, while Norsk Data began its rush to Unix following heavy financial losses.

March: The UniForum trade show in San Francisco saw previously stubborn open systems opponent Data General begin to fightback with its first Risc-based Motorola 88000 AViiON workstations, and DEC's showstopper was a multi-user version of its new DECstation line. Intel caused a stir with its i860 Risc processor, claiming that workstation vendors which had already chosen their next generation of CPUs would now think again. AT&T, Olivetti, Prime and Convergent began work on a multi-processing version of Unix for Intel processors - and rashly promised it for the end of the year. AT&T hoped to steal a yard on the OSF's Motif interface by shipping source code for its Open Look graphical user interface. SCO - with a little help from its friends - announced a desktop graphics and database bundle for Unix called Open Desktop at less than $1,000 in a challenge to OS/2. The Japanese Nippon Mining Company sold Gould Computers to Encore - but Gould had to lend Encore $140m to do the job - while minisuper makers Cydrome and Scientific Computer Systems fell under market pressure, and operating systems vendor Microport was put up for sale.

April: Intel's predictions for the i860 seemed to ring true as Stratus turned tail and abandoned Motorola's 88000 in favour of the new chip - but Motorola shrugged it off by attempting to steal the thunder of Intel's much-awaited 80486 launch with a preview of its own 68040 processor, while Tektronix launched its 88000-based XD88 workstation line. Sun held its first major hardware launch for a year, with a blitz of new Sparc and Motorola-based systems, but again this was somewhat overshadowed by the news that Hewlett-Packard had bought workstation pioneer Apollo Computer for $476m - pushing it ahead of Unisys and just behind DEC in size. French giant SGS-Thomson bought up the UK's promising Transputer technology with the acquisition of Inmos International. But while Control Data was shutting down its ETA supercomputer business, stirrings at the low-end of the market looked more encouraging, with "mass-market" dealerships for Businessland and MicroAge for IBM's AIX systems, newly announced for the PS/2. Businessland also took the NeXT computer from Steve Jobs. The Open Software Foundation issued its second Request for Technology to find a method of distributing software in a single format, independent of target hardware. Following the virus scares at the end of 1988, trusted Unix became a hot topic, with Addamax and SecureWare offering new secure operating systems technology. In the UK, the fast growing Pegasus Group stepped in as the last minute buyer for Sphinx.

May: At a Tokyo Unix summit this month, Unix International and the Open Software Foundation both joined X/Open, in a move hailed as the start of a long process of reconciliation between the two groups. Also at the meeting, Japan's Sigma project said it would conform to X/Open's Common Application Environment Portability Guide. There were already rumours flying around about the imminent arrival of IBM's next generation successor for the RT, known as Rios. First reckoned to be heading for a summer launch, the expected launch was soon put back to October. Now running from Olivetti, AT&T began selling its 3B2 boxes directly in France. DEC announced plans to bundle Relational Technology's Ingres database with every Ultrix licence - a big boost to Relational given that too many firms were fighting to get their databases onto a finite number of computers. Meanwhile, Unigram revealed that DEC had sacrificed binary level compatibility with other Mips-based machines on its new Risc lines by reversing the byte ordering to fit in more closely with VAXes. Pyramid revealed plans to rebadge Mips systems at the low-end. Hungry UK software house Mysis snapped up two Unix acquisitions, TIS Ltd and Mentor Systems Ltd.

June: Attention in the Unix world shifted from Tokyo to Toronto, where the Canadian Multi-User Unix exhibition was held. Here it emerged that Sun was so far the only recipient of a patent letter from IBM spelling out its claimed intellectual ownership of Risc technology - and show speculation put a mid-1990 launch date on the RT Rios machine. Following a meeting in Montreal, X/Open said future editions of its Common Applications Environment would represent the wishes of users, manufacturers, members and non-members alike, in a document known as the Prospectus of Market Demand, to be published later in the year. Elsewhere, Apricot launched the first Intel 80486-based machine in the UK, NCR got the multi-processing bug with a new Tower, and Sony launched its first Mips-based workstation in Japan. Xerox collected royalties from Metaphor Computer Systems for its Metaphor iconic graphical user interface, calling into question Apple's long running suit against HP and Micrososft. And in a shock announcement, Unix high-flyer Sun predicted a sticky end to its financial year with profits down and a huge backlog of orders waiting to be filled, then raised a further $250m funding from AT&T and others. NeXT Computer won another powerful ally in the shape of Canon, which paid $100m for a 16% stake in the company. Control Data's troublesome UK Systime business dissolved into five companies after management buyouts. Prime still reckoned it could finding a better offer for its business than that from MAI Basic Four.

UNIX IN 1989

Unix V.4 looks set to dominate. IBM disappoints with non-appearance of AIX 3 and Rios.

July: X-Windows hit the spotlight this month with the Xhibition in San Jose, where the general consensus was that OSF Motif was winning the interface battle - both Motif and AT&T's Open Look interfaces became generally available for the first time this month. Unisys declared that it would use the Motorola 88000 in future systems, while DEC unveiled a further Risc line of products as an alternative to the VAX - Mips-based DECsystems set against top and low end VAXstations. Silicon Graphics came out with an eight processor 160 MIPS server, and Evans and Sutherland weighed in late with its 1,600 MIPS supercomputer. AT&T finally sold its stake in Olivetti, introducing a new line of PC systems OEMed from Intel to replace the Olivetti products. Pick Systems said it would intergrate the Pick operating system with Unix over the next year. Arix looked to broaden its product base with the acquisition of Edgecore Technology, and while takeover bells rang at Nixdorf yet again, Prime revealed its white knight to stave off the hostile MAI bid - J H Whitney & Co coming to the rescue with a leveraged buyout.

August: Even with the i860 still in the sampling stage, Intel was rumoured to be working on an enhanced version optimised for multiprocessing, touted as the i870. Concurrent got cold feet and pulled the plug on its joint Supercomputing Solutions venture with General Microelectronics, and AT&T appeared to be having second thoughts about its support for the Sparc chip, saying it "still had to decide" on a Risc part for a new generation of 3B2s. However Philips became the first European manufacturer to fabricate Sun's processor. Apple lost its copyright infringement lawsuit against Microsoft and HP, but still reckoned it could win on the issue of overlapping windows. McDonnell Douglas announced it would float its computer systems business on the London Stock Exchange. Yet another top-end systems casualty was Elxsi, which gave up on its 64-bit minisupercomputers and laid off over half of its workforce. Following its $375m fourth quarter loss Wang was in trouble with all its financiers and began laying off staff, whilst Unisys was looking to shed 10,000 jobs. Noises coming out of the summer UniForum show in Boston indicated a November launch for Unix V.4. Comdex show organisers the Interface Group pitched in with a Unix Solutions show set for October 1990, bringing the number of major US Unix shows up to five - the others worried.

September: Bitter graphics supercomputer rivals Stellar and Ardent merged to create Stardent in what sounded like a marriage made in hell. Intel's 80960 Risc chip appeared and was immediately taken on board by the Intel/Siemens joint real-time venture BiiN. Relational Technology developed a multiprocessing version of its Ingres database. Sun, Novell and Netwise announced a plan to combine their networking technologies to allow shrink-wrapped software to run across a variety of networks and architectures. Inmos launched a 10 Mips transputer at $20. Leaks about licensing and pricing for Unix V.4 looked like sparking off a new industry row. AT&T boosted Pyramid's fortunes by taking its MISservers to top off the 3B2 line in a deal worth hundreds of millions. NeXT released new system software for the NeXT machine, planning a 68040 machine for early 1990. IBM was going to be three months late in shipping version 3.0 of AIX, but the OSF still promised its AIX-based OSF1 would come out on time.

October: Rows over the license fee for Unix V.4 were largely avoided with a fee set by the Unix Software Operation that generally worked out to be cheaper than previous fees, although favouring the low-end of the market. The computer industry's Silicon Valley survived a monster earthquake relatively intact. Bull paid $635m for Zenith Data Systems, making it top European computer manufacturer ahead of Olivetti. More good news for Mips, when Bull, Nixdorf and Pyramid said they would be taking up a Mips-Risc option in future. The Open Software Foundation was revealed to be more worried about IBM's AIX delays than it had let on, and was set to incorporate Mach multiprocessing capabilities into OSF1, following hints from Hewlett-Packard that it might wait for OSF2. Ravaged by its takeover battle, Prime had to withdraw from Unix multiprocessing efforts. Intel and Siemens pulled the plug on their short lived BiiN project, while Stratus brought fault-tolerance to the low end with a new Unix box. Hewlett-Packard rushed out an 80486 EISA bus machine, and Unisys unveiled some major imaging systems. Hoskyns paid £12m for UK Unix veterans the Instruction Set, The European Commission decided it couldn't wait for X/Open to make up its mind on a interface and plummed, like many others, for OSF/Motif. Sun looked to break even in the current quarter, and landed another $250m in funding, but put its Tops networking division on the block at the same time. IBM's Rios did not appear, and was now expected at UniForum in January 1990.

November: At Unix Expo in New York, Unix International and the Unix Software Operation unveiled Unix System V.4, confirming that although the Open Software Foundation had won the most support for its interface, Unix V.4 had taken the operating system battle hands down. OSF1 was not now expected until late 1990, and talk at the show suggested that the most concrete merger talks so far between the Foundation and Unix International were now beginning, with discussions round a sale of the Unix Software Operation to a joint consortium along the lines of X/Open. In other news, Intel unveiled an applications binary interface for Unix V.4 on the 80X86 line of processors, and entered the operating system software market in competition with Interactive Systems Corp and Santa Cruz Operation, while SCO itself revealed the first shrink-wrapped multiprocessor version of Unix with extensions from Corollary Inc. Mips also plotted a course through the byte-ordering minefield created by DEC announcing a binary interface standard for its Risc chips, and launched new ECL R6000 processors and systems, saying it would go public in the new year. DEC launched the top end VAX 9000S series. Compaq unveiled its 486 Deskpro systems, and found a bug in the Intel chip, delaying system manufacturers all round. AT&T set up a new division to sell computer systems directly in Europe - previously handled by Olivetti. Evans and Sutherland gave up on the ES-1 supercomputer, only launched in July.

December: Sun introduced its first purpose built Sparc servers, and Sony unwittingly revealed two more Mips Risc chips in the pipeline, while newly-wed Stardent produced its first sibling, a Mips Risc-based system from the Ardent side of the firm and promised i860 models in 1990. Amdahl abandoned its efforts to market Fujitsu's Unix supercomputers and laid plans for its own. AT&T and Unix International got a further boost when Japan's Sigma project opted for Unix V.4. Norsk Data's Dolphin subsidiary signed with Motorola to do a 1,000 Mips ECL version of the 88000. IBM launched the 80486-based PS/2 70. The year ended with a launch date for the the Rios box touted as the end of February of 1990 and finally Apple's chickens came home to roost - Xerox slapped a $150m lawsuit on it for royalties from its iconic graphical user interface.

SOFTWARE NEWS

OPERATING SYSTEMS

Delays and changes of course in its Unix software and strategy have been excessive even by IBM's standards, but the company had more bad news last month when it announced that AIX Unix 1.2 for the PS/2 had been delayed - none of IBM's AIX implementations for personal computers or 370s have shipped on the original date promised. AIX PS/2 1.2 and the companion Network File System, the Transparent Computing Facility and TCP/IP 1.2 and X25, all promised for delivery last quarter, are delayed until March 30 and the Application Program Interface function for AIX PS/2 X25, announced in March 1988, will not be available even then - IBM now promises only a date for it in March. "The decision to delay these products is based on the need for additional testing, required to ensure the delivery of quality products," IBM says.

The time when users will finally get single-user desktop software that can really exploit the benefits of the 80386 chip - before the thing is completely obsoleted by the 80486 - came a step nearer as the Old Year died and Microsoft Corp sent it on its way with the news that the first release of the Software Development Kit for the interminably promised 32-bit version of OS/2 was now available. Components of OS/2 2.0 Kit includes a pre-release version of OS/2 Standard Edition version 2.0 with Presentation Manager, a 32-bit compiler based on Microsoft C optimising compiler version 5.1, a 32-bit version of the Microsoft Macro Assembler version 5.1, Presentation Manager tools, sample code and OnLine support. For the first pre-release version of the Kit, the developer will need an 80386 or 80486-based personal computer with a risible 6Mb main memory - you can successfully run a nuclear power station with a mainframe with less memory than that - EGA or VGA graphics, and a 60Mb hard disk. The pre-release version has IBM's blessing and can be used for developing applications for the IBM version of OS/2 Version 2.0, but is available only through Microsoft. It costs $2,600, $8,500 for four copies, but there is no ~~seasonal~~ cheer from Microsoft - there is no upgrade pricing available for purchasers of previous versions of the OS/2 Development Kit.

Nippon Unisoft Co and Toshiba Corp have joined forces to do an implementation of Unix System V for Toshiba's TX1 and TX3 microprocessors, which are optimised for the Tron operating system. The parts currently support Tron-OS and Ready Systems Inc's VRTX real-time kernel. Unisoft will market the new Unix as UniPlusTX, but doesn't expect to sell more than five copies of the thing over the next 12 months, Newsbytes Japan says.

DATABASE TECHNOLOGY

Informix Software Inc, Menlo Park, California is offering a new interactive report generator, Informix-QuickStep, designed to enables users to build Structured Query Language database queries and custom reports through an interface that the company believes will be easy to use for those with no experience in SQL syntax. For developers, QuickStep provides optional Informix-4GL source code generation, so that developers can spend their time customising existing applications rather than writing base code. Reports can be created from information stored in any Informix database, and SQL database queries are built up using query-by-example techniques, using pull-down menus and fill-in-the-blank forms. Join screens enable users to relate information in different tables. Informix-QuickStep will be available on a range during this quarter. Workstation pricing goes from $360 for a single user to $2,280 for up to 32.

Teradata Corp, Los Angeles is taking its challenging DBC/1012 back-end relational database management system, which harnesses scores of Intel 80386s for superfast parallel searching, into the Unix world - and has chosen Cambridge, Massachusetts-based Charles River Data Systems as its partner. The aim is to develop an extended client-server offering for the large systems market, and the first products from the partnership will be a Unix capability added to the DBC/1012, and a remote Data Base Computer capable of serving multiple clients, while acting as a client itself to the central DBC/1012. These two products are set for announcement in the spring. Until now, the DBC could serve clients but not other servers, Teradata notes, adding that the new agreement will lead to a layered architecture, within which a remote server can also be a host-client to the DBC/1012 and sees the combination enabling users to gain the advantages of both IBM's Systems Application Architecture and open systems environments. Teradata says that it remains committed to Systems Application Architecture principles and protocols but also intends to integrate the Unix environment to integrate the islands of information found in large enterprises.

X-WINDOWS

After showing a demonstration version of its AT&T Unix V.4-based 486/ix operating system at last month's Unix Expo show in New York, (UN No 10), Interactive Systems Corp says that when available in the first quarter of next year, 486/ix will support Sun Microsystem's XView toolkit as well as X-Windows, the Interactive Motif Development System - based on OSF/Motif - and Visix Software Inc's Looking Glass desktop manager interface. On the 386/ix operating system, Interactive is also supporting its Motif development system - cost is $500, and a Motif User Environment, which has all the end-user bits for running X applications - the window manager and user's guide - but no facilities for application development. Price is $250. Furthermore WordTech Systems Inc's Quicksilver/Unix, which allows DOS-Based dBASE applications to be compiled and run under Unix without modification, and FaxIX, the on-line fax transmission application from PC Research are also now available for the 386/ix.

Seiko Instruments Inc, San Jose, California, is pushing the boundaries of the X-Windows environment forward with the introduction of an X-Windows colour print filter that allows its CH-5500 series of colour printers to function as a shared resource, accessible from up to 80 networked X-Window workstations. The CH-XWIN-XX filter allows control of dithering matrix size and fill order, image intensity, colour correction, image windowing, and X and Y scaling and translation independently, from a range of user interface tools. X converts the data to an X raster file, which is translated by the filter to Seiko's CHGL graphics language before being sent to the printer for printing, bringing colour graphics printing to X-Windows for the first time. The filter and printer can be configured to any workstation or server that supports a parallel Centronics port, or via Seiko's NS-2034 Ethernet adaptor that uses TCP/IP. A single user licence for the filter is $500, for two-to-ten users it is $1,500 and thereafter $750 for each additional ten users. The 300 dots-per-inch CH-5500 printers go from $6,000 up to $15,000.

Hummingbird Communications Ltd of Markham, Ontario, has announced HCL-eXceed Plus, a protected mode version of its X-Window server for PCs running MS-DOS: the new version gives TCP/IP connected PCs full access to X-Windows applications, making up to 16Mb of memory directly available to X clients, breaking the 64K memory barrier of the real mode version.

And Hummingbird also has a new product, HCL-eXtend, which provides PC-based X servers with a DOS/Unix file management facility: the product allows DOS and Unix file handling commands to be used interchangibly.

COMMUNICATIONS

Boston Business Computing, Andover, Massachusetts, and Ki research Inc, Belmont, California, have signed an agreement to jointly develop DECnet support for Vbackup, BBC's emulation of the VMS Backup utility for Unix machines. It will consist of additions to Vbackup which will allow it to work over Ki's Unix implementation of DECnet - called DEKnet. It will be available on Alliant, Data General, Mips Computer Systems, Multiflow, Sequent, Stardent, Sun Microsystems and Tektronix hardware from the first quarter of this year - prices go from $400 to $4,000.

UShare, Information Presentation Technologies' Apple Mac-to-Unix connectivity software, is now available for Sun Microsystems' Sun-4 and Sparcstation-1 systems, Hewlett-Packard's 9000 series 300 and 800 workstations, DEC's DECstation 3100 and Mips Computer Systems' hardware. uShare resides on the Unix host and allows Apple Macs on the network to use the full range of Unix resources. uShare - based upon TCP/IP - supports Ethertalk Phases I and II, as well as a LocalTalk interface to Sun, Apollo, Mips and Sony systems. uShare also incorporates a Virtual Disk facility that allows Macs to run diskless by storing the MacOS operating system and user files on a virtual disk running on the Unix host, a Unix-compatible electronic mail system, and support for a range of peripheral devices. IPT is based in Calabasas, California.

Hewlett-Packard has announced the first fruits of its collaborative agreement with Northern Telecom Ltd, unveiling HP's Applied Computerised Telephony software and Northern's Integrated Services Digital Network Applications Protocol for its PABXs: the combination allows for the simultaneous arrival of telephone call and computer file to the desktop, identification of the phone number and customer called, and automatic callback - software runs on HP's 3000 MPE/XL and HP9000 Unix machines.

Cleo Communications, Ann Arbor, Michigan - a division of Interface Systems Inc - is offering its DataTalker 3270 U/X multi-user PC-to-mainframe communications software for Unix systems on DigiBoard's DigiChannel/Xi intelligent input-output boards for IBM PCs, PS/2s and compatibles. DataTalker supports AT&T Unix V.3, SCO Xenix 386, and Interactive's 386/ix. It has IBM 3278/79 terminal emulation, with Cleo's own application programming interface and IBM's HLLAPI, NetView support, 3287 printer emulation and is configured for four and eight port versions of the DigiChannel board, with synchronous and asynchronous support. The four port version is $2,595, or $2,895 on the eight port board.

WHEELIN' AND DEALIN'

January - with the new decade, winds of change blowing through the European computer industry bring news that West German steel king **Mannesman AG**, which has just won the contract to construct and operate West Germany's second cellular telephone network, is this month poised to take control of struggling **Nixdorf Computer AG. Nixdorf** has a board meeting scheduled for January 22 and a press conference set for a day or two later at which the full details will become clear.

UK software venture startup, London-based **Zebra Parallel Ltd**, which was developing a parallel processing environment called Equus, providing tools for developers to produce parallel programs, has gone into liquidation - its backers putting the stops on further funding. Zebra is actively seeking a buyer.

Fault-tolerant Unix systems company **Sequoia Systems Inc** is being wooed in every direction. **Ultimate Corp** is pumping $4m into the company in return for an equity stake, and at the same time, **Hewlett-Packard** has confirmed that it will put $5.8m - representing a 10% stake - into **Sequoia**, and plans to market **Sequoia** machines under its own name and use **Sequoia**'s fault-tolerant technology for its own systems.

A surprise bidder for the assets of liquidated **BiiN Inc**, the defunct real-time systems joint venture between **Intel** and **Siemens**, has come forward in the shape of **Pyramid Technology**.

AT&T reduced its headcount in the US by 25,000 during 1989 - at least 10,000 are already set to go this year, and likely many more.

On top of the $600m that **Groupe Bull** is to pay for the business of **Zenith Data Systems** it is now clear that the deal could top the $1bn mark with news that **Bull** is to purchase monitor and power supplies worth $450m from **Zenith** over the long-term. **Zenith Electronic** is to plough the profits from the sale of its **Data Systems** subsidiary - **Bull** is paying around $19m over the odds - into the development of High Definition Television technology.

And **Bull** has signed up for **Network Computing Devices**' X-Window terminals which it is to sell worldwide.

In France, **Altos Computer** and **Minnesota Mining & Manufacturing, 3M**, have formed a joint maintenance subsidiary, **TIM, Technical Maintenance Computing**. Similar operations will be opened in West Germany this month, and in the UK in July.

Sun Microsystems has broken into the French financial systems market with the sale of 60 386i workstations to Paris-based brokerage house **The Tuffier Group** via French systems integrator **Effix Systems**.

And **Sun** says that 45% of its total revenue now comes from sales outside the US, with Europe accounting for 25% and the Pacific rim 20%. Sales of the Sparc and Intel-based lines are increasing at the expense of the Motorola-based line. Sun has shipped 40,000 Sparcstation 1s since their introduction last April, and expects to sell another 100,000 this year.

Hitachi has signed up with **Sun** to license Sun's Open Network Computing/Network File System technology on Hitachi's near-IBM compatible range of mainframes, which run under re-writes of IBM's MVS and VM operating system.

SPREADSHEETS

Access Technology, Natick, Massachusetts is to integrate its 20/20 spreadsheet package with Control Data subsidiary Micrognosis' Digital Distribution System, for the financial services industry, under a joint marketing and technology agreement. It is intended to give financial traders access to real-time market data from DDS, which can then be analysed within the real-time version of 20/20. The 20/20 RealTime Connection will be available during the first quarter of next year.

The Unix version of Informix's Wingz spreadsheet, which was on the drawing board as far back as July 1988, will be available on Sun Microsystem's Sun-386i, Sun-3 and Sparc workstations this quarter. It has been jointly developed by Sun and Informix, and is based on the Open Look graphical user interface, priced at $700. It supports all of the Sun's colour and graphics capabilities, as well as the SunView windowing environment, and text and graphics data exchange between SunWrite, SunPaint and SunDraw. In addition Sun and Informix have signed a joint marketing and development agreement to sell Informix software on Sun's hardware platforms.

COMPILERS

Ada compiler specialist DDC International, Phoenix, Arizona, has been signed up by Intel to do a version of its DDC-1 Ada compiler system for the i860 Risc processor, and an Ada cross compiler for VAX host computers. Named the DACS-80860, it will include an Ada compiler, symbolic debugger, run-time system, downloader and program library. Whilst the DACS-80860 will be available to all system developers, the cross compiler is aimed primarily at i860 system developers in the military arena, and Intel's Military Division will retain exclusive marketing rights for the thing. DDC expects to do a Unix version of the compiler set in the future. Intel reckons it will begin shipping military temperature samples of the i860 by the second quarter of 1990, and producing MIL-STD-883/C Class B parts before the end of next year. A validated version of the compiler is expected sometime during the first half of 1991.

Borland International has signed the rights to the Turbo Prolog language compiler back to its original developer the Prolog Development Centre, Copenhagen, Denmark: PDC is to develop and market new versions of the software under the name PDC Prolog - OS/2, and new DOS versions will be available in February priced $500 and $250 respectively, with other Unix editions to follow by the middle of the year.

OTHER NEWS

Autodesk Inc, Sausolito, California announced plans to move its AutoCAD mass market computer-aided design software, written for MS-DOS on the IBM personal computer, over to DEC's DECstation line of Unix-based desktop engineering workstations. The DECstation version of AutoCAD, running under Ultrix, is to be available by the end of this month and will be compatible with the 12 MIPS DECstation 3100 system but will be priced the same as other AutoCAD for other 32-bit machines - currently $3,000. Autodesk will also continue to support DEC's VMS-based workstations. Recommended configuration for DECstations running AutoCAD is one disk, at least 8Mb of memory, an SCSI port, mouse and an Ultrix licence.

Its coming up to two years since Xios Systems UK was formed from the reorganisation of Canadian dedicated word processor pioneer AES Data, and the company thought it time to give a progress report. The company's speciality now is the fashionable business of systems integration - in the office automation arena. It claims to provide "integrated office information management solutions to allow all levels within an organisation to interact and use information more effectively". Installation, maintenance, engineering, project management and information technology consultancy services are also offered. Xios claims an in depth knowledge of open systems standards and offers TCP/IP and Ethernetworking, connecting Micro Channel and AT bus personal computers to DEC, IBM and ICL environments. Unix applications offered include Uniplex and Q-Office office automation and Wordperfect, Systems Union Ltd accounting, Informix and Sybase database and Interleaf desktop publishing to complement Xios's own vertical market software for local and national government. It offers its own iAPX-86 family of personal computers and Sun Microsystems Sparc, 68000 family and 80386 machines. Xios Systems (UK) Ltd was formed in March 1988 by a merger between AES Data Inc, Canada, a subsidiary of the Kinburn Group, which specialised in office text management systems and Xios Systems Corp, Canada, which develops and markets office networking and integration software. Before the merger both companies were making a loss but last year the UK business alone did £500,000 profit on approximately £15m turnover. The company has direct sales organisations in six countries including Switzerland, Germany, England and Scotland, in Wales and Northern Ireland sales are via dealers, there are also 20 other distribution channels throughout the world. Headquarters of Xios Systems (UK) are in Slough, Berkshire and between the nine regional offices 250 people are employed.

San Jose, California-based Panoramic Inc has announced plans to market SecureNet, a network security product for transaction processing systems. It provides initial security by granting application and functional level access to users. This is enhanced by encrypting information during transport and storage, and by an authentication process that verifies the identity of the user. It operates with most hosts, and Panoramic says that it complements host access control security systems such as Tandem's Safeguard, IBM's RACF, and Computer Associates Inc's ACF/2 or Topsecret. Developed with Atalla Corp of San Jose, and Tandem Computers, Securenet will be available in the second quarter.

IBM's first offering for the New Year is an Integrated Reasoning Shell, a "knowledge-based system family of software products" to enable users "to build and run knowledge-based applications in a multi-platform environment" more efficiently within the AD-Cycle and System Application Architecture frameworks. Knowledge bases under the new shell can be developed on the PS/2 under OS/2 and on the RT under AIX using the development system, and can be designed to run under OS-2, AIX-RT and VM and MVS with the appropriate Runtime System. It costs a one-time $7,500 for the Development System and $750 for the PS/2 and RT Runtime Systems; the 370 Development System is $11,000 to $113,000 and the 370 Runtime System from $3,000 to $28,000, available in the US in July.

HOW THE ANSI C STANDARD TOOK 18 MONTHS TO GO FROM C TO D AND BACK AGAIN

Standards efforts are often tortuous, but seldom has so little progress been made in so much time as in the efforts to standardise the C programming language, increasingly the lingua franca of the systems programmer. William Fellows tells the frustrating story.

For anyone that enjoys a good shaggy-dog story - after adventures rivalling those of Indiana Jones, the rary bird stands on the cliff-top alongside its treacherous companion and faces imminent destruction with the remark "it's a long way to tip a rary" - we reported in May last year that, despite criticisms from principal C originator Dennis Ritchie, the ANSI X3J11 standard for the C programming language was nearing completion, with the end of the time period allowed for public comments on the proposed draft, and that a full release could be expected thereafter. However with no standard forthcoming, we heard from the British Standards Institution in July of this year that the standard would be late because of objections, raised on the grounds that as it stood X3J11/88-158 as it is known, would present a number of problems for programmers writing embedded C code. While we are now - finally - assured that the ANSI C standard will be published this week, apparently it has not changed one iota from its original guise, established 18 months ago or more.

Disgruntled

Why? It seems that after the period set aside for public comment had elapsed, one disgruntled American C programmer, Russell Hansbury, asked, quite rightly, why he had received no reply to his comments regarding the pitfalls that awaited embedded systems programmers in the standard as it stood. Very broadly Hansbury proposed changing the precedence of operators in C - and although this might have improved the language for some at least - such changes would have made most C software obsolete: in the words of one observer it would have effectively meant changing C into something else, "like D". The X3J11 committee found that Hansbury's comments had been received by its technical group, but had been lost somewhere between there and its reviewing body. X3J11 eventually considered his objections, but then rejected them and sent the standard off to the American National Standards Institute - ANSI - for adoption. Hansbury, somewhat miffed at the blunt rejection of his comments, and with the support of other like-minded C-types, subsequently wrote to ANSI with the same objections.

IBM, DEC compilers waiting in the wings

ANSI, somewhat wary of adopting the standard as it stood, when there was potential opposition, agreed to review the comments, but had no established appeals process to do this. In the face of the bureaucracy he was encountering, Hansbury eventually gave up and withdrew his appeal, which had already held up the standard process for some considerable time, and as a result, the ANSI C standard will be adopted this week. The standard - albeit rather belatedly - paves the way for government procurement contracts to go ahead, specifying requirements for C compilers that conform to the standard. Indeed it is thought that many companies have been waiting patiently in the wings for ANSI C to materialise, and are set to release ANSI-compliant C compilers - IBM and DEC amongst them. Furthermore, insiders reckon that as yet none of the C compilers on the market would pass the conformance tests that have been established as a result. The British Standards Institution for one has a European conformance testing service for C compilers that has been lying idle for some time, and is now to begin offering its testing suite to C compiler manufacturers. At the same time, ANSI C is also about to undergo a process of revision that will address and document all the known problems with the the existing draft - without any fundamental changes - and will lead to its adoption by ISO, the International Standards Organisation. Again a period set aside for public comment will be followed by a review process, estimated to take up to a year all told. This revised draft will then be adopted by ISO and ANSI as their definitive standard for the C programming language.

UK trouble brewing

It has also emerged that there is trouble brewing over UK standardisation procedures in information technology. Currently a whole host of committees meet under the umbrella of the Information Standards Technology group - IST-5 - to monitor events and establish standards processes, which are administered by the Department of Trade and Industry. These are open to all interested parties from industry, government and education alike. However, ructions are in the air as the Department of Trade & Industry, under the auspices of "Project Disc", is set to change all this. It reckons that the industry spends vast sums on trying to establish its own standards, but not enough on contributing to the bodies that oversee them. Consequently, from next year, delegates will have to pay for the privilege of sitting on these committees, with those that pay the most eligible for the most representation. Insiders say that there is much opposition and bad feeling about this move, and that standards work has all but ground to a halt for the present. The British Standards Institution was in the process of trying to set up a C++ standards committee, but has given up on its efforts until the new guidelines become clear. Meanwhile the US is gaining a clear head start - ANSI has already set up a C++ language group and is pushing ahead to define a standard.

Having adopted the D-NIX real-time Unix developed by **Diab Data AB**, Stockholm, and launched the Swedish company's machines in the US, **Dynatech Computer Systems Inc** , Mountain View, California has now taken a licence to manufacture the 68030-based multiprocessors. It will build pedestal and rackmount machines with up to four 68030s to support up to 256 users.

Alliant Computer Systems Inc, Littleton, Massachusetts, retained by **Intel Corp** to help with software for the 80860 RISC processor, is to launch its first 80860 machine this month. The machine is expected to have up to 32 80860 processors packed four to a board, with each board having 2Mb of static RAM cache for a CPU-to-cache memory bandwidth of 1.6G-bytes per second - implying peak throughput of 400 MFLOPS.

Ingres Corp says that its Ingres relational database management system is the first in the world to run on **Cray Research** X-MP and Y-MP Unix machines running Cray's Unicos implementation: in future releases the product will be optimised to provide for large memory, high I/O bandwidth and computational capabilities of the Cray machines.

Fourgen Software Inc of Edmonds, Washington, has expanded its recent cooperative software program agreement with **IBM**, allowing FourGen Accounting to be offered on IBM's RISC-based AIX computers (including the unannounced RIOS machines) as part of a "pre-installed business system" that also includes the Uniplex office automation suite, installed on the hard disk at the IBM factory: FourGen, recently upgraded to Version 3.0, has been developed using Informix-4GL, SQL and CASE tools from **Informix Software Corp**.

Siemens Data Systems has announced support for **Oracle Corp**'s Oracle relational database for both its 7500 mainframe family under BS2000 and for the MX line of Unix boxes.

Surprise! Surprise! **IBM**'s workstations chief James Cannavino says the next generation RTs will run OS/2 - one day - as well as AIX: the news should cause few flutters because we all know the new RTs will use the Micro Channel, which is designed to support bus mastering, where any processor on the bus can take over the system or run concurrently without reference to any "main" CPU so it should be child's play to do an 80386 or 80486 board for OS/2 to plug into the box; IBM and Microsoft have said that they would be doing OS/2s for other architect ures, so there may be a native version, but there seems little point.

Anthony Latchoo, a product manager at **NCR Corp**'s Waterloo, Ontario base, was arrested by Federal Bureau of Investigation agents as he left **Unisys Corp**'s headquarters in Blue Bell, Pennsylvania and charged with trying to sell NCR trade secrets on its document imaging technology and strategy to Unisys: such a theft would have cost NCR $100m, but Unisys tipped off the authorities in Philadelphia, enabling the Canadian to be picked up in flagrante delicto.

AI Ltd's Strand Software Technologies division is now offering its Strand88 parallel programming language on Mips Computer Systems and Encore's Multimax hardware.

Wayland, Massachusetts-based **Hamilton Laboratories** ' Berkeley C-Shell for OS/2, which runs in a Presentation Manager window or on full screen, is now sold and supported in the UK by **Roundhill Computer Systems Ltd** , Marlborough, Wiltshire - price is £235. The C-Shell for OS/2 was developed by former Risc engineer at Prime Computer, Doug Hamilton, and contains around 40,000 lines of code.

NCR Ltd in the UK has now launched its 68030-based Tower 32/300 and 32/500 systems: they cost £11,500 and £25,000 respectively, both available this month.

New York's recent Unix Expo show was attended by 19,340 Unix enthusiasts - against 16,500 last year - according to the show's owner, **National Expositions Company Inc**, this was despite the power failure on the last day of the show which kept many visitors outside, and those inside all in the dark.

Associated Computer Experts Bv, Amsterdam, Holland, has produced a report comparing benchmark tests carried out on over 100 Unix systems - price is $495.

Cambridge, Massachusetts-based **Mosaic Software Inc** now has versions of its Lotus 1-2-3 compatible spreadsheet - Twin/UX - available for Sun-3 and Sun-4 systems.

SQL connectivity specialist **Gnosis NV**, Antwerp, Belgium, has formed a British subsidiary, **Gnosis UK Ltd**, based in Stockport, Cheshire, and headed up by Richard Taylor - France is to be its next port of call.

Moss - a 3D modelling application for highway and civil engineering, mining, land survey and construction projects from **Moss Systems Ltd** of Horsham, is now available on Intergraph's Clipper Risc-based Unix workstations.

Tektronix UK Ltd has belatedly announced the low-end XD88/10 in its family of Motorola 88000-based Risc workstations, it was previewed in October in the US: prices in the UK start at £14,395, shipping early next year.

C is now the third most popular computer language in Europe, according to **IDC** in Germany - Basic is still number one in terms of the number of programs, but Cobol far outstrips it in number of lines - and Maidenhead, Berkshire-based **Migration Technology** says it is reaping the benefit through increased demand for its CGEN BASIC-to-C software translator products.

Altos Computer Systems UK now says that all existing users of its 386 Series 2000 systems can upgrade their machines to the 2000-EP, with up to 64Mb RAM, a 600Mb ESDI disk module and 8, 12, or 16Mb memory boards.

Both **Data General**'s 88000-based AViiON line, and supercomputers from **FPS Computing** will soon be able to communicate with DEC systems via software brought in from **Technology Concepts Inc**, under OEM deals the Unix systems makers have recently signed with the Sudbury, Massachusetts-based **Bell Atlantic** company: Technology Concepts' CommUnity software connects Unix systems, PCs, Macintoshes and other proprietary systems to DECnet - FPS is to resell CommUnity under the name FPSnet/DN.

Zentec Corp, San Jose, California, has a new version of its Genisys processing terminal which uses a 16MHz Intel 80386sx chip. The Genisys SX Processing Terminal can be configured as a stand alone system, or with a local area network card, as a terminal on a LAN or a multi-user system. On the SX, Zentec has removed the CPU unit from the monitor housing and packed it into a wedge-shaped base unit. It has from 1Mb to 8Mb memory, two PC/AT slots, a SCSI interface and costs $1600 in OEM quantities.

Graffcom Systems Ltd, Old Isleworth, Middlesex, has launched a top-end version of its Lotus 1-2-3-compatible Accounts II accounting package for Unix - its files can be accessed from SQL applications, it features a window manager, multi-currency and a report generator: initially available running on AIX, with other Unix versions to folllow, Accounts II is from £375 to £800 per module depending on the number of users.

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