UNIX® NEWS

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London, December 1989 **Number 10**

OPEN SOFTWARE FOUNDATION AGREES ON MAKE-UP OF OSF/1

The revised plans for the Open Software Foundation's OSF/1 operating system have now emerged more clearly from the frantic industry activity of the last few weeks. The new plan - made in response to member requests for the inclusion of symmetrical multi-processing and B1 level security - is for OSF/1 to become generally available in November 1990, although preliminary versions will begin filtering through to members from January of next year. An early version of OSF/1 has been demonstrated at the meeting running on a Risc workstation. The revised OSF/1 will use Mach kernel technology from Carnegie Mellon, together with symmetrical multi-processing and parallel computing enhancements from Encore Computer Corp. Alongside will be "significant portions" of IBM's AIX operating system - thought to be around 800,000 lines of code - networking streams technology from Mentat Inc, and the BSD 4.4 network file system code from the University of California at Berkeley. The aim is to create an operating system composed of modular elements with a small secure micro-kernel, a set of extensible server processes and transparent shared libraries for backward compatibility. And the move away from any dependence on AT&T code is highlighted in the latest set of written material from OSF, which avoids any mention of the Unix trademark throughout, and therefore does not have to credit AT&T as the trademark holder. The new plan means that the Foundation will be in a competitive position with AT&T's Unix System V.4.1 (the secure version) and V.4.2 (the multi-processing version) by the end of 1990.

CONCURRENT REVEALS REAL-TIME ALPHA O/S PROJECT, AND NEW MIPS SYSTEMS

Concurrent Computer Corp is working on a project - codenamed Alpha - to produce an operating system capable of handling huge distributed, military and commercial applications in a real-time environment - and is seeking partners to help with the thing in Europe. The project has already been funded to the tune of $10m by the US Department of Defense, and Alpha is designed to run on a new generation of multi-processor Risc and complex instruction set systems networked with the Fibre Distributed Data Interface, from the Tinton Falls, New Jersey firm. The first of these is due to be unveiled in January, using the Mips Computer Systems Risc chip. The operating system, implemented in C++ (with possibly an Ada version in the future) will incorporate some aspects of expert system technology, with non-deterministic behaviour for assessing strengths and weaknesses of alternative courses of action, as well as being able to fire off multiple instructions simultaneously. Finished versions of Alpha won't be around until 1993, but experimental copies will be installed at test sites from the middle of next year - prototypes have been in operation at Pittsburgh's Carnegie Mellon University and at General Dynamics Corp in Fort Worth, Texas, since 1987. Concurrent's Unix System V.4 compatible real-time operating system, RTU, will co-exist with Alpha in its next release. Concurrent is working with SRI International to produce an A1 secure version of Alpha, and with General Electric to develop fault-tolerance and application software. Primary beneficiaries will be the military, where Alpha will be used for battlefield systems in air and space, and on sea and land. However Concurrent is also eyeing the potentially lucrative financial and banking industry, hungry for globally integrated real-time systems, and the opportunities that integration of the European market will bring in 1993. Thomson-CSF and INRIA, the French national research institute for science are among those understood to have expressed an interest in the technology. Alpha will be licensed free to those agencies that have put money into the project, and it is already in the public domain for governmental use in the US. Licences will be sold to industrial users - no prices have been fixed yet. Alpha is the brain-child of former Carnegie Mellon researcher Doug Jensen, who has been working on the thing for years - he was signed by Concurrent last year and brought the project with him.

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STARDENT UNVEILS NEW MIPS-BASED TITAN STATION

Mini-super newly-wed Stardent Computer Inc, nee Stellar, nee Ardent, produced its first offspring last month - the Stardent 3000 graphics supercomputer. It comes with one to four 32MHz MIPS Computer Systems R3000 processors, and is rated at 128 MIPS, 192 MFLOPS fully configured. With up to four 128Mb memory boards it is claimed to offer vector and three-dimensional quadrilateral-drawing speeds of up to 300,000 and 150,000 per second respectively. It supports Dore, Ardent's object oriented graphics library, but not yet Stellar's Application Visualisation System, which will be up in the first quarter of next year. Shipping in volume next month, the entry level 3000, with one 32Mb processor, a 380Mb disk drive, graphics, two SCSI channels, Network File System, a VMEbus interface, Ethernet and Unix V.3 is £72,300 - the server version without graphics is £56,000. A four processor model with 64Mb and 760Mb disk is £151,100. The 3000 comes from the Ardent side of the relationship - Ardent used the MIPS part in its Titan series, and says it will standardise on MIPS in the future - and is compatible with the Stardent 1500 system, formerly the Titan II. Upgrades to the 3000 are £20,300 each, and it claims 100 orders already.

DEC TO ABANDON DECWindows

DEC is - for all intents and purposes - to literally turn DECwindows, currently offered on all of its hardware, into Motif. Such a move is a fairly logical progression to integrate the two environments and offer a single user interface right across its ranges. Motif was originally built upon DEC's toolkit application programming interface, the core of which is the X user interface, but has been enhanced with other features. Jean-Claude Monney says DEC's plan is to begin shipping Motif - including the user interface language - on its systems from January 1990. The X user interface is to be migrated to Motif, so that DECwindows will become Motif in all but name, with all its features retained. Subsequently the Motif version of DECwindows will be available on its systems.

TATUNG SHOWS FIRST SPARCSTATION-1 CLONES

Tatung Co of Taipei, Taiwan has won the race to become the first to show a low-cost clone of Sun Microsystems' Sparcstation-1, putting pre-production desk-top and deskside models of the TWS-5000 on show at the Comdex show in Las Vegas last month. Tatung is using the 25MHz Cypress Semiconductor version of the Sparc chip set and claims 15 MIPS and 3.0 MFLOPS for the machine, rather more than Sun claims for the Sparcstation-1. The TWS-5000 has support for up to 1,152 by 900 pixels in eight colours, Ethernet and SCSI controllers, and 8Mb to 32Mb memory. The deskside system, ostensibly multi-user, will start at some $8,000, $1,000 below Sun's base tag and the desktop model is expected to be from $7,000. Production is planned for second quarter of 1990.

SHOWCASE

UNIRAS LAUNCHES NEW GRAPHICS SOFTWARE

Copenhagen-based Uniras' UK operation took the opportunity to launch three new graphics software packages at the Computer Graphics Show in London last month. Picture Manager, which runs under X-Windows, Sun View and DECwindows on Sun, DEC and H-P Unix hardware allows users to import graphical images that conform to the Computer Graphics Metafile image communication standard, over Ethernet. Images can be manipulated within a mouse-driven user environment, before transportation to a range of printing devices. A Motif version of Picture Manager will be around by the beginning of next year. The second product, Unimap 2000 is designed for the analysis and display of scientific and engineering data in 2D, 3D, 4D, colour or monochrome images. Uniedit 2000 is a graphics editor which allows users to modify images produced by other Uniras software. Prices start at £1,500 for Picture Manager and Uniedit 2000, £3,000 for Unimap 2000.

ICL PLOTS CASE STRATEGY AT CASExpo-EUROPE

At last month's CASExpo-Europe '89 held in London, ICL revealed that it is to begin marketing the Sema Group's Advanced Data Dictionary directly on its Unix-based kit running under Ingres from January. It is to be integrated with ICL's own Data Dictionary System, which will allow the transfer of information right across its ranges. Case tools that ICL currently supports, such as Ernst and Young's Information Engineering Workbench, Technology Corp's Excelerator and Hoskyn Group's Project Manager Workbench will be moved over to Unix during the coming months. These developments will be extended to include support for ICL's forthcoming family of Sparc-based systems, previewed last month, (UN No 9), which are to be offered with Officepower, Ingres, and initially a choice of the Open Look or Motif graphical user interfaces. Also at the show Verilog SA's UK subsidiary, based in Mayfair, W1, launched three new tools - a new version of its Geode real time design software which now includes a simulator, and generates C code; a new testing facility in its Ada-based Logiscope quality analysis tool, as well as an enhanced version of the ASA needs analysis tool for Sun Microsystems' 3/80 and Sun-4 workstations. High-flying Systematica Ltd, Bournmouth, was showing its Virtual Software Factory running under OS/2 and Presentation Manager on the PS/2, and DSA Software, Edgbaston, Birmingham, was showing off its DSA Generator development tool which produces C, Cobol and Pascal code on Unix, PC, DEC and IBM hardware.

TOPLOG'S UNIX BRIEFING

The Belgian operation of Metrologie SA's Unix software distribution company Toplog held well-attended Unix Application Forum conference in Antwerp - with the aim of drumming up support for Unix in the Benelux countries. According to a report by IDC and commissioned by Toplog, Unix shipments from Belgium totalled $101m last year - largely dominated by Siemens kit. In the software distribution stakes, Toplog leads the way with a 47% market share, followed by Info Universe with 11.8%, Infomac, 4%, TopData, 3.8%, and direct manufacturer and proprietary Unixa-like sales making up the remainder.

SWEDISH TECHNOLOGY ADVANCES ON A MATURE MARKET

John Abbott reports from Stockholm

The Unix 89 trade show in Stockholm was the fifth annual show to highlight the Swedish marketplace, and revealed what is now a remarkably mature sector of the industry in Sweden. Show visitors were typically representing government institutions, large companies or academia, and there was no sign here of the industry simply selling to itself.

For the outsider, one of the big surprises of the show was the dominance of Diab Data, based in Taby near Stockholm. Diab, a major supplier of computer systems to the Swedish Government, has a range of multi-processor 68030 systems that include the DS90-30, using up to two 25MHz chips, and the DS90-31, with up to four 33MHz 68030s, supporting up to 250 users. These are shared memory multi-processors that dynamically allocate the processor load without any need to alter the application. More well known in the general European marketplace than Diab is Nokia Data, which was showing its full range of Unix-based systems not yet widely available outside Scandinavia. Joining the established Sun-based Alfaskop System 20 range - which Nokia has adapted as a commercial multi-user system rather than as a workstation - Nokia was showing the Sparc-based System 30 range, currently sold mostly to the software development market, and its own-made System 10 Alfaskop line, using Intel processors, including the recently launched Alfaskop System 10 Model 57 80486-based system, which with 8Mb memory, 300Mb hard disk and 150Mb tape streamer costs 200,000 SEK (around £20,000). System 10 machines are Unix-specific, and are compatible with X/Open's XPG II common applications environment standard.

Siemens AB is preparing an entry into the X terminal arena, showing a prototype from its 70%-owned Norwegian affiliate Tandberg Data A/S at the Unix '89 exhibition. The thing is built around Texas Instruments' 34010 graphics signal processor with 1Mb to 5Mb memory and a 13" 1,024 by 768 pixel screen at about $4,000, although a cheaper, PC-based version will be $3,200, available early in 1990.

The software industry in Scandinavia is booming, largely due to the inflexibility of imported products in dealing with support for languages other than English. Understandably, Swedish users demand their own language on screen - and that includes error messages. Some foreign products, such as Uniplex II Plus, can adapt to these requirements, and Uniplex was widely seen around the show. But native packages such as the Mimer database from Uppsala-based Mimer Software, and the widely used Nectar fourth generation language for Unix, VAX and MS-DOS systems from Ceratina Systems AB, Hasselholm, were more commonly seen around the stands, Ceratina chose the show to launch the new version 4 of Nectar, which now supports Informix and Oracle as well as Mimer, and has been ported to AIX for the PS/2.

Object-oriented programming appears to be taking off in Scandinavia, with a number of companies, including CEC of Kista and Abalon, Bromma, showing products. Abalon was showing a prototype of its own Xancus II software development environment on the Informix stand. Xancus II is a development tool that works over the relational database and provides an interface into the data - it has already been used to develop a number of software packages now out on the Swedish marketplace.

HARDWARE NEWS

MASS MARKET MACHINES

Compaq Computer Corp has duly weighed in with its initial EISA bus and 80486-based machines, launching the Deskpro 486-25 at £10,500 to £15,000, and the Compaq Systempro PC System, an 80386-based server aimed at multi-user and networking applications, and able to support up to two processors. Both use the EISA bus and the Systempro goes from £11,000 to £19,000. The company also unveiled Compaq Lan Manager 386-486, based on Microsoft Corp's LAN Manager and claimed to be the first 80386-based LAN Manager designed to take advantage of both 80386 and 80486 microprocessor technology; it costs from $2,500.

Commodore is becoming a little more forthcoming about its future Unix plans. The 2500UX, a standard 2000 box with a 68030 board upgrade running Unix V.3 and AmigaDOS, is regarded basically as a development system, Commodore UK believes it very unlikely that the thing will ever come to market. What is planned is a 68030 3000 machine running Unix V.4 and AmigaDOS, partitioned like MacOS and A/UX on the Macintosh, which will be out at the beginning of next year.

Apple Computer Inc will come out with a six-slot model in its NuBus-based Macintosh II family to be based on the 50MHz version of the 68030 early in 1990. The new IIxi will be "30% to 100% faster" than the current top-of-the-line IIci, the magazine hears; it is expected to be accompanied by the introduction of the 7.0 release of the operating system.

MAINFRAMES

Amdahl Corp has unveiled 370-type mainframes that come in below its 5890 and 5990, specially configured as Unix hosts and servers running Amdahl's UTS 2.0 version of System V.3.1. It is offering the 7300-150 uniprocessor at from $730,000 and the 7300-250 dual at $1.254m from January. The 7300-150 is rated at 40% to 45% of the power of the 5990-350 uniprocessor, but the 7300s can be configured with up to 256Mb of main storage, can support more than 1.6Tb of disk, and provide virtual addressing supported by UTS. The 7300-150 supports more than 250 active users with average response time of less than a second in office automation or program development, the 250 more than 400 users. The machines are built of 3,000-gate ECL arrays with a delay time of 180pS for registers and logic, 20,000-gate CMOS for the channels. They have 16 channels standard, going to 32, eight at up to 4.5Mbytes-per-second, and up to 256 sub-channels are supported. Based on Fujitsu M760 hardware, with further developments from Amdahl to optimise the machine for the company's UTS Unix implementation, the 7300 does not use the same processor as Amdahl's mainstream 5990 Series range.

Encore Computer Corp revealed plans for a new top-end Concept 32/2000 in its minicomputer line inherited from Gould Computer Systems, saying it had "unequalled" context switch times, task-to-task dispatch, input-output throughput, and totally deterministic performance - and it would ship in first quarter 1990. A Motorola 88000 RISC system for multiprocessor MPX and Unix has been in development for two years and will ship in second half 1990.

NEWS ROUNDUP

November...wedding bells, death knells ? **X/Open**, the organisation tipped to buy Unix if **AT&T** goes ahead and spins it out, (UN No 9), and **UniForum**, the recently re-christened US **/usr/group** have been making eyes at each other that could eventually see them married and merged into a single entity. The pair are reckoned to be on the brink of announcing that they are going to collaborate on portability and operability standards, and consolidate their separate marketing activities into one thrust. It would give **X/Open** a ready made group of Unix-mad users, as well as the prestigious **UniForum** show, strengthen its ties with the appropriate standards bodies such as the **IEEE**, and make the group more palatable as the vehicle to buy Unix from **AT&T**.

Despite lusty promises of 250 MIPS 80486-compatible microprocessors from **Intel Corp**, and **Motorola** talking enthusiastically about a 68050, the heyday of the complex instruction set microprocessor begins to look as if it is drawing very gently to a close. Following **IBM** and **Microsoft**'s suggestion that OS/2 will be implemented for Risc architectures, (UN No 9), there is mounting speculation that **Sun Microsystems** is to trim its sails squarely on to a Risc course that may leave the Motorola-based product line floundering in its wake. However reports in the US trade press that **Sun** has killed its effort to develop 68040-based successors to the 68030 Sun-3 family and is phasing out the Sun-3 altogether because the machines do not match the price/performance of its Sparc Risc systems look premature. Sun says it will do a 68040 machine if its users insist, and **Sun** is known to be preparing and 80486-based 486i workstation for sometime next year - see page 11.

In addition to revealing what its operating system will look like, (see front page), the **Open Software Foundation**, is set to call for a range of software for its Motif graphical user interface from the Unix industry with three new Requests for Technology due to go out towards the middle of next year. First the Foundation wants a desktop manager for the interface, as Motif is an X-Windows-based toolkit contained in a user-friendly graphical environment for application building which has no manager as such. This is sure to provoke fierce competition amongst the contenders - the two main products on the market which are meeting head-on to fill this void are X.desktop from UK company **IXI Ltd**, Cambridge, and Looking Glass from **Visix Software Inc**, Arlington, Virginia. The two other Requests will be for a user interface tool and an interactive design tool for use with Motif and the manager, though it is thought the latter will concentrate on finding a methodology for a consistent design format rather than a product as such.

AT&T has been quietly setting up an international division of its Data Systems Group, to be headed up by AT&T executive John Boyd, and based at Norfolk House in London's St James's. Called **AT&T Computer Systems - International**, it marks AT&T's most serious move into the European market to date, and will incorporate the computing activities of its British information technology services firm, Istel, acquired at the end of September. **AT&T**'s European interests were previously handled through its partnership with **Olivetti**, but as the two drew further apart over the last year, **AT&T** has found itself in need of a direct presence. **Olivetti** still sells around 30,000 PCs a year to AT&T, but its low-end systems are now sourced directly from **Intel**'s system division and the company now sells its 3B systems directly in France. **AT&T** is now working on setting up its own sales channels in the UK.

SERVERS

Banyan Systems is to introduce an 80486-based server at the top of its range in March next year. The Banyan CNS/486, running at 25MHz, is optimised for version 4.0 of its Unixalike Vines network operating system. It will be offered in three models, each with 8Mb RAM. With 146Mb hard disk the price is £28,300, with 320Mb it is £28,725 and a 660Mb disk version is £30,485. A 4Mb burst-mode memory add-on board will be available for $3,605, an 8Mb version is £6,125. An upgrade from the CNS/386 to the 486 machine will cost £10,075. At the same time prices of the 25MHz versions of the CNS/386 are reduced by 11% to £22,600 for a 146Mb disk version, or £23,100 with a 320Mb disk. Banyan will offer a CNS/386 at 25MHz with 660Mb hard disk in February for £25,000.

Unisys Corp has added an 80386-based server for AT-alikes and Convergent CTOS stations that takes up to 30 loosely-coupled processors. Running CTOS, the base XE-530 has 4Mb 80386 CPU with 64Kb cache, two SCSI channels and local net controller, with prices starting at $28,000 for a box with 145Mb disk, tape, and support for 32 stations. First ships are set for March; a four-CPU system will take 128 stations, disk goes to 7.5Gb.

MULTI-PROCESSORS

Arix is preparing a January introduction of its next-generation System 90, a three-member family of multiprocessor Unix-based systems incorporating both 68030 and 68040 chips. Users will need to move through only three systems to go from a single-user desktop system to a top-of-the-line 512-user multiprocessor. Five kinds of peripherals will be supported - including read-write optical, WORM, CD-ROM - as well as three hard disk formats, 3.5, 5.25, and 8-inch. Software will include the OSF/Motif interface, X-Windows, and three RDBMS, Oracle, Ingres, and Informix. Cobol and C programming languages and DOD B1 level security will also be available. Networking will initially start with TCP/IP and X.25, migrating to the OSI/GOSIP specification as third-parties make it available.

Mountain View, California-based Dynatech Computer Systems Inc - still much better known as Cromenco - has followed up its agreement to take a licence for Stockholm-based Diab Data AB's D-NIX real-time Unix by introducing the DCS-1 series for real-time, distributed data base, heterogeneous networking, and transaction processing. The VMEbus machines support TCP/IP, Ethernet and have gateways for IBM, Macintosh and MS-DOS machines. The family consists of a Pedestal model with up to two 64Kb cache 68030 processors, two 68882s and support for up to 42 users; the rack takes the full complement of four of everything. Processors can be added transparently to the user - the system simply runs faster. Pedestals are from $26,820 with one 4Mb processor and floating point unit, D-NIX, 150Mb disk, four 6U VME slots; three SCSI channels at 1.5M-bytes-per-second each; and four RS232 ports. Pricing on the Rack begins at $49,600 with two of each of the processor complexes above, a 300Mb disk, and the same complement of ports as the Pedestal.

American Mitac introduced its first multiprocessor, the tightly coupled 25 MIPS rated Series 500, employing two to seven 386-25 CPUs, linked by a corollary C-Bus running Corollary's Symmetrical Multiprocessing (SMP) version of SCO Unix - see software news. In its minimal two-processor configuration, the 500 supports up to 16 users - expanded to a full seven CPUs, Mitac says it can handle 160 users. The system features a dual-bus architecture combining the high-speed Corollary bus, which links CPUs, with an industry standard AT bus for I/0, enabling the 500 to accept existing AT-compatible add-on cards and peripherals. The series 500 offers 14 slots, 6 C-bus, 5 AT-bus and 3 C- or AT-bus, SCSI and a 500-watt supply over Compaq's 11 slots, IDA or EISA, and 300-watt power supply. Mitac says in one-two CPU configuration the 500 will do 6-12 MIPS; 2-3 CPUs, 15-30 MIPS; 3-5 CPUs, 20-50 MIPS and 4-6 CPUs, 30-100 MIPS. It tags entry level cost at $15,000 for two CPUs versus Compaq at $16,000 for a single CPU. Full-scale delivery early in 1990.

Apricot Computers has emerged as the latest customer for the new multi-processing extensions to Unix developed by Corollary Inc and packaged by the Santa Cruz Operation, see page 7. Apricot will run it on a 25MHz dual symmetrical processor version of its i486-based VX FTServer . Apricot's Dual Symmetrical Processor Architecture - DSPA - gives each processor its own high speed 128K hypercache, and the two processors share the main memory and interrupt structure of the Micro Channel. The system also includes dual SCSI controllers, and Apricot says it will double the performance of current VX FTServer models running LAN Manager, SCO Unix or Novell NetWare, though only SCO MPX will support symmetrical multi-processing. Deliveries start late in the first quarter of next year: no prices.

CHIPS

International Chip Corp, Columbia, South Carolina has been commissioned by Ricoh Co to fabricate an artificial intelligence co-processor chip designed to eliminate the need for special software to run expert systems programs. The REX Resident EXpert chip is being offered in versions for AT-alikes, Sun Microsystems workstations and NEC Corp's PC-9801 family. The co-processor board will be marketed with Rule Compiler software that provides people with no programming knowledge the means to develop applications - it prompts for input in plain English. Once the expert system has been developed with the Rule Compiler, it will run on any machine with the co-processor installed. It has local memory capacity for up to 10,000 rules. The boards cost $1,500 apiece, and the Rule Compiler is $2,000 to $5,000. The current version of the chip runs at 10MHz - which translates to a rule-handling rate of 1.67m rules per second, and a 20MHz version is planned for next spring.

Ada specialist Alsys Ltd got together with hardware partner Inmos Ltd to announce the availability of the first military qualified versions of the transputer, including validated Ada compilers. Inmos is offering military customers the 16-bit IMS T222M and 32-bit IMS T800M, and says that the T400-based T425M will become available next year. The two Alysys compilers validated are a DEC VAX to transputer cross compiler, and a self-hosted version for the T800 transputer "mothered" by an IBM PC or compatible.

Intergraph's Advanced Processor Division has introduced a new version of its Clipper Risc microprocessor which sits below the current low-end C100 offering. The Clipper C200 chipset module comes with a central processing and floating-point unit, two cache and memory management units and a clock chip. A 25MHz version rated at 6 MIPS is $200 for 5,000 up, the 8 MIPS, 33MHz set is $220 in the same quantity. The central processing and floating point unit is also available separately in 25MHz and 33MHz versions which cost $75 and $83 respectively, again for 5,000 and up.

BOARDS

IBM has launched its first major bus-mastering coprocesssor for the PS/2 in the shape of the Wizard Adaptor, an 80860 RISC board that will ship before year-end to customers and third party application developers. Wizard enables compute-intensive tasks or whole applications to be moved from the 80386 or 80486 and execute much faster on the 80860. The new board, with a 33MHz Intel 80860 microprocessor, is an application accelerator busmaster card for PS/2 Models 70 and 80 designed for advanced, numeric-intensive applications. The 80860 processor features a RISC integer core, an advanced floating point processing unit, a graphics unit, and internal instruction cache and data cache in a single 1m transistor chip. The adaptor has 2Mb of random access memory, expandable to 8Mb using the PS/2 Wizard Memory Expansion Option. The Adaptor uses a set of application device drivers for OS/2 which control the processor and provide interface functions to the 80386 and 80486. IBM intends to provide AIX support in a future release. Applications have to be recompiled to run with the 80860 processor. The Wizard Adaptor, which IBM rates at 3.8 MFLOPS on the Linpack Single Precision benchmark when installed in a 25MHz PS/2 Model 70, costs $7,000 in the US, and Wizard Memory is $3,685. Both are available on a limited basis from December 29, and on general release in the second quarter 1990.

Sky Computers Inc, Chelmsford, Massachusetts claims 40 MIPS and 80 MFLOPS performance from an application accelerator board for Sun Microsystems workstations and other VME-based systems, which combines the Intel 80860 and 80960 RISC-based microprocessors. The Skybolt applications accelerator uses the 80960 as an input-output processor to scientific applications; it costs $12,450.

Fujitsu Microelectronics Advanced Products Division, Interactive Systems Corp, Insignia Solutions Inc and Via Technologies Inc have announced a two-staged strategy aimed at significantly accelerating the proliferation of Sun Microsystems Inc Sparc-based desktop personal workstations. Fujitsu will license to computer makers a Sparc VME Board Set manufacturing package with all the specifications, layout, drawings, bill of materials and such needed to produce a Sparc-based three-board set running SunOS at 12 to 15 MIPS, and will include Insignia Solutions' SoftPC so that the resulting machines can also run the over 50,000 MS-DOS applications out there. SoftPC comes with a pre-installed version of MS-DOS 3.3 and the Microsoft manual, MS-Mouse driver, GW-Basic 3.0 and SlavePC for direct cabling between the host and an MS-DOS box.

Ultra Network Technologies Inc, San Jose, California has a family of VME host adaptors that link Silicon Graphics Inc's Professional Iris and Iris Power Series workstations to the UltraNet high-speed network, providing data transfer rates of over 5Mbytes-per-second memory to memory; host adaptor packages start at $10,800, and include UltraNet Adaptor, coaxial transceiver and UltraNet software licence; a fibre optic transceiver is also offered; there are also UltraNet adaptors for FPS Computing Inc Model 500 series at $14,000; and for MIPS Computer Systems Inc M/2000 servers and the new RC3260, with a version planned for the RC6280; UltraNet software is $4,000, the hardware for MIPS starts at $8,500 and is available for the smaller machines in the first quarter, and for the RC6280 in the second quarter, 1990.

X-TERMINALS

AT&T Computer Systems has launched some graphics related products, including a new software tool to help developers to write applications for the Open Look graphical user interface, and two X-Windows products: the 730X Terminal and software allowing PCs to act as X Terminals. The new tool, called Open Look Express, simplifies the task of writing Open Look applications by offering an interface drawing tool that negates the need for coding. The tool is designed for developers who are not X-Windowing system programming experts. Other enhancements to Open Look included improvements to the graphical user interface and end-user systems, as well as to the toolkit and XWIN windowing system. AT&T will also be selling on Locus' PC Xsight Server Release 2.1 to run on its Intel-based MS-DOS PCs. The new 730X Terminal is an X version of AT&T's 630 MTG multi-tasking terminal with graphics. The terminal includes a 1024 x 1024 high resolution screen, and includes a StarLAN 10 network access unit with ISO or TCP/IP protocols for 10 Mbit/sec host connections. MS-DOS applications can also be accessed on AT&T hosts by using AT&T's Simultask software, which includes a limited MS-DOS emulator, and allows users to move back and forth between X and non-X applications (including the MTG environment). The terminal includes a removable cartridge containing the X software.

C.Itoh Electronics, Irvine, California, is pitching itself into the booming X-terminal workstation market with its CIT-X monochrome Network Display Station, which supports X-Windows and DECwindows. It is built around a 12.5MHz Motorola 68301 processor and a Texas Instruments 34010 graphics chip, with VT52, VT100 and VT220 terminal emulation. It comes with up to 2.5Mb RAM, supports Telnet, TCP/IP, Ethernet, and a 15" monitor. It costs $2,795, and C.Itoh says that DECNet compatibility will be added by the middle of next year.

Siemens AG has caught up with the competition, bringing out its first 5.25" Winchester to store over 1Gb. The Megafile 6200 series comes in versions with capacities up to 1.2Gb and has a 14mS seek time. It uses high-resolution media, thin film heads, rotary voice coil actuator, integrated motor design, dedicated servo surfaces and monocoque design. Transfer rate is 20Mbps and evaluation units will be available in the first quarter of 1990 at $3,000 apiece.

HOW COBOL WITHSTOOD THE FOURTH-GENERATION

by John Abbott

Just as Unix is turning hardware into a commodity item, reducing a user's dependence on a single supplier, so the gradual establishment of the SQL structured query language is doing the same thing to database vendors. So says a new report on fourth generation languages, written by research team Martin Butler and Robin Bloor, which appropriately takes an end of the decade look at a market sector that seems to have promised a lot more than it delivered. From the early eighties on, unfortunate Cobol developers were bombarded with sales and marketing pitches telling them that they were shortly to become obsolescent, replaced by technical users (not necessarily programmers at all) with tools that could produce complex applications at ten times the speed, with the added benefits of portability and flexibility thrown in. In theory, most commercial software authors should have abandoned 3GLs altogether by now. In practice, it is estimated that Cobol is still used for over 40% of the current systems produced in the United States, while use of the C language, spurred on by its advantages of portability and close ties with Unix, has boomed. What went wrong, and what is now right?

The report - 4GLs: an Evaluation and Comparison, published by ButlerBloor Ltd of Hull - identifies a number of crucial factors essential to the success of a fourth generation language that were not widely recognised initially. The common factor that tied the twenty-two fourth generation language products studied in the report turned out to be the their use of a data dictionary, holding fields, database tables, forms, and occasionally procedures. The 4GL is simply a front-end for exploiting the information in that dictionary, and code should be developed with this in mind. It is better, says the report, to think in terms of a fourth generation environment, consisting of dictionary, forms management package, query language, report writer and conventional 3GL, which encourages more effort on the original analysis and design stages that many 4GL vendors have led us to believe are no longer necessary. 4GLs impress when generating routines of commonly used functions - such as a simple file maintenance transaction - but often fall down when a non-standard task is required. One case study in the report tells of a user spending two weeks "bending" a 4GL product to produce a bar code routine that would have taken one hour in a conventional language.

Performance trade-off

One aspect of 4GLs that did become rapidly evident was that functionality in 4GLs was nearly always gained at the expense of performance. Early 4GL-produced software was often notoriously slow and memory hungry. Not only that, but the advantages of elements adaptable by the end user often led to the production of over complex reporting tasks that could take up vast amounts of CPU time. Looking for ease of use led many of the early 4GLs to opt for a non-procedural approach to their languages, leading to an inflexibility that has been avoided by the newer, procedural 4GLs. And one area that is still rarely addressed in 4GLs is a good debugging facility - surprising since a recent survey by Ready Systems Inc revealed that software maintenance can account for 67% of the total project cost, with testing set at 15%, requirements, analysis and design at 11%, and coding itself a mere 7%.

$3,000m market is target for 4GLs

Despite all this, the 4GL market is very healthy, with estimates of a $3,000m market for databases and 4GLs during 1990. The products themselves have developed from the earliest versions, and new generation hardware is now more capable of coping with the extra overheads 4GLs demand. As the report points out, most of the major independent software houses - Computer Associates, Oracle, Ashton-Tate, Ingres, Cincom, Software AG Cognos and Information Builders - are all offering 4GL products, and there are promising products from smaller, but significant companies such as Sybase, Unify, and the Netherlands-based company Uniface. Around 40 products on the market are available on DEC VAX platforms, and 30 or so run on Unix. Very few are now specific to a single hardware platform. The report covers 22 products including the VAX specific Systel and IBM specific Synon/2. The other 20 are all available on Unix, aside from Software AG's Natural product and Computer Associates CA-DB:Gen, which will both be available in Unix versions "soon".

The report divides product assessment into six categories: development environment, performance, architecture and scope, inter-operability, end user functionality and portability. Overall, the best ratings are achieved by Computer Associates and Software AG, which both score top marks on performance and architecture and scope. CA-DB from Computer Associates is in fact the software it acquired from its takeover of Cullinet last year, and is not strictly a 4GL at all, but an applications generator producing 3GL code with embedded SQL, resulting in high performance, and "open" Fortran, Cobol or C code not constrained to either a proprietary database or 4GL.

The good, the bad and the ugly

The pay off is maintenance, as there is currently no means of reverse engineering the 3GL code produced back to the 4GL. The other products singled out by the report include Accell from Unify, and Uniface, which is also bundled in Europe with the Sybase database as Fastbuild. These products gain top marks for the development environment, with the Uniface product making extensive use of a powerful data dictionary, with good forms management and full database independence. Those not faring so well include Today (now owned by the giant Computer Power Group), which is criticised for its largely non-procedural approach, and the older 4GLs such as Microprocessor Development Group's Sculptor (hard to interface with 3GLs) and the UK National Computer Centre's Filetab. Other products covered include Focus, Informix, Ingres, Mimer, Oracle. Powerhouse, Pro IV, Progress and SAS.

Commodity databases will force 4GL differentiation

The 4GL explosion is only just beginning. The widespread use of SQL means that database prices will begin to fall, and vendors must find a way of differentiating their products from their competitors. Of the trends in the 4GL marketplace, the most important is database independence, identified astutely by Unify Corp, which recently unbundled its Accell set of tools from its own database, and even persuaded its deadly rival Oracle to market them. Taking inter-operability further, it is likely that some vendors will release "reverse engineering products" that will allow users to switch from one 4GL to another if they wish, thus breaking the language lock-in. This has already been done with 3GLs such as Cobol, and should be far easier with 4GL products. Object-oriented functionality will become increasingly important, with closer ties between 4GL and 3GL class libraries. And says the report, the move in hardware to client/server configurations will largely address the performance limitations, particularly associated with functions such as scrolled areas, windowing and the use of high level constructs - client/server hardware architectures being "the ideal hardware set-up for 4GL systems". Perhaps the days of Cobol are numbered after all.

4GLs: an Evaluation and Comparison, is available from ButlerBloor Ltd of Hull, priced at £380. Telephone 0482 227511.

SOFTWARE NEWS

OPERATING SYSTEMS

The Santa Cruz Operation Inc will offer SCO MPX for 80386 and 80486 boxes next quarter, describing it as the first shrink-wrapped multi-processor version of Unix. It adds the multiprocessing extensions developed by Corollary Inc, Irvine, California, (UX No 239), tacked onto SCO Unix System V/386 3.2 and SCO Open Desktop. It runs on AT, EISA and Micro Channel micros and up to 15 copies can be supported for up to 16 processors. Pricing is $900 for each additional processor; the machine must already have SCO Unix or Open Desktop.

Intel Corp, has come out with its own brand of Unix System V.3.2 for all 80386 and 80486-based personal computers, likely to be a major competitor to the Santa Cruz Operation and Interactive Systems. The $500 shrink-wrapped package is intended to be the Unix standard for personal computers designed to run MS-DOS and supports the iAPX-86 Applications Binary Interface developed with AT&T Co. Intel is also offering Network File System, TCP/IP, X-Window System and the Locus Computing Corp Merge MS-DOS under Unix utility; an Intel Unix based on System V.4 is set for first quarter 1990. Meanwhile Interactive Systems Corp has demonstrated 486/ix, which it claims is the first commercial product based on AT&T's System V.4. Like the Intel version, it will ship first quarter next year.

DEC has introduced a new version (UWS 2.2) of its Ultrix operating system, incorporating Adobe Systems' Display Postscript for WYSIWYG screen displays. By using Display Postscript, users can view documents on screen exactly as they would appear on paper.

And DEC also announced Version 1.2 of its VMS/Ultrix Connection layered software product for VAX VMS systems, which allows networking, file access, remote terminal access and applications development between VAX VMS servers and Ultrix and other Unix-based hardware. Enhancements include Telnet Internet networking protocol support, TCP/IP support for DECWindows Release 2, C language Berkeley socket programming interface support, and new pricing for clusters, which now starts at $1,205 for a 10-unit cluster.

Convex Computer Corp, Richardson, Texas has enhanced COVUEnet/Multi bus and COVUEnet/VME in the new V2.0, moving the protocol code from the Excelan controller into the CPU side of the ConvexOS kernel so that the number of logical links available to DEC VAX users linking to Convex's C-series of minisupercomputers is now 100. There is also an enhanced Network Control Program facility, support for VMS mail so that mail can be delivered over DECnet, and the software is now compatible with X Window and DECwindows. Priced from $16,500, they ship in 90 days. COVUElib V2.0 increases the number of routines to 183, making it easier for users to transfer VMS applications written in C and Fortran to the Convex box and it is from $7,300. COVUEbinary V1.0, a VAX Binary Data File Format Utility serves as a bridge between VAX/VMS files and Convex Fortran. It converts files to a record format understood by either the Convex or VAX system and starts at $8,200.

S&H Computer Systems, Nashville, Tenessee, introduced its TSX-32 operating system at the DEC User show in London, through UK distributors Ace Microsystems and JPY Associates. TSX-32 is touted as a jack-of-all-trades, incorporating real-time, multi-user, multi-processing and networking features for Intel's 386 and 486 microprocessors. It is claimed to offer a similar interface to the majority of operating systems on DEC PDP-11 and VAX systems, and to offer an upgrade for 386 and 486 machines without the trials and tribulations of having to adapt to Unix or Xenix. It provides a multi-user MS-DOS environment, will run "well-behaved MS-DOS programs," and supports DECnet, TCP/IP and Novell's Netware networking software.

McDonnell Douglas Computer Systems Co, the Santa Ana, California company in the process of becoming a UK-registered public limited company quoted in London, has a new Pick implementation for IBM MVS mainframes. R/370-MVS runs under MVS Time Sharing Option and enables Reality and Pick applications to run on the host while maintaining the integrity of MVS. Time Sharing Option is designed for development and for interactive applications that require ad-hoc data manipulation. R/370-MVS is designed as a functional Reality and Pick environment and maintains MVS operating system integrity by using industry standard sort routines, and IBM's VSAM as its file structure, JES for its spooling and printing, and ISPF and its full screen editor.

Quantum Software Systems Ltd, the Ontario, Canada-based company with the counter-Unix operating system QNX, is developing a Posix-compliant version of its real-time, multi-tasking, multi-user networked operating system. Focusing on the 1003.1 (system interface), 1003.2 (shells and tools) and 1003.4 (real-time) levels of compliance, Quantum hopes to be able to release the new version at the end of the first quarter, 1990. Binary compatibility with 386/Unix (QNX is only available for Intel architectures) is a longer term goal. Quantum has also come up with its own object-oriented graphical user interface. By-passing X-Windows as too slow and too memory intensive, they have written their own 400k windowing system for Open Look. QNX, QNX Windows and Open Look can be booted up on a 286 machine with 1Mb RAM from a floppy, says the company, while Unix with X-Windows would require a 386-based machine with 6Mb. Like X-Windows, the QNX version is server-based, and takes advantage of the message-passing architecture of QNX to provide distributed, device-independent computing.

DATABASES

Relational Technology Inc has duly changed its name to Ingres Corp, and the new Alameda, California-based Ingres has unveiled the Ingres Intelligent Database, claimed to be the first of its kind. It can manage objects and embed extensive rules or knowledge directly into the database, to model all critical aspects of an enterprise within the database server. The system is created by the addition to Ingres of two new products, Ingres Object Management and Knowledge Management. Ingres itself is enhanced with input-output reduction techniques, compiled database procedures, on-line back-up, two-phase commit, international sorting sequences and an Intelligent Query Optimiser. Knowledge Management provides business rules that can transparently track everything from referential integrity to changes in inventory and warehousing, to documentation and purchasing procedures. The database is from $5,000 to $180,000 and the Knowledge Management and Object Management extensions will be offered separately with pricing at a percentage of that for Ingres.

And Ingres has a new interface for its relational database developed in conjunction with Sun Microsystems. Simplify is based on the Open Look interface, and allows users to interrogate a database and manipulate information without any knowledge of database query or report generation languages. Its four components are DataBrowse, a query editor, ReportWrite, to manipulate and format reports, SchemaDesign to design, edit and save data, and Ingres Utilities for utility selection.

Progress Software Corp is to add an interface gateway to Version 6 of its Progress fourth generation language, giving it access to DEC's Rdb/VMS relational database management system. The new version, due for release in the second quarter of next year, will also support Oracle Corp's DBMS, and will transparently read and write DEC RMS files. Progress will continue to be offered with its own RDBMS as well. The move should make Progress the first 4GL to run across RDB, RMS and Oracle for all DEC environments, allowing distributed applications across VAX/VMS, VAX/Ultrix and Risc/Ultrix operating systems. Progress supports ANSI standard SQL, and will interface with Rdb through DEC's Rdb SQL. As well as its own Data Dictionary, Progress will also support DEC's Common Data Dictionary, CDD/Plus, and native DEC editors such as EDT. The Progress Rdb Gateway, available as a front-end application development module, will cost from $2,550 to $115,000 depending on the processor, and will be available, with version 6, in the second quarter of the year.

Informix is set to release a Unix version of its SmartWare II office automation package next year, which will integrate with its database engines including the recently announced OnLine, (UN No 9). It will provide DOS-to-Unix connectivity and retain a single user interface design.

Stratus Computer is continuing its push into the Unix market with the announcement that it is to offer Oracle V.6 on its fault-tolerant, on-line transaction processing systems from the first quarter of next year, under a five-year marketing and technology sharing agreement signed recently. First available on the Stratus XA 2000 machine under the proprietary VOS, it will be moved on to Stratus systems running Unix System V.3.2 "later in 1990". Pricing is to be announced along with product availability. Stratus launched its first full Unix option for the XA 2000 Model 30 back in October, promising availability for the first quarter of next year.

COMMUNICATIONS

The TOPS Division of Sun Microsystems Inc - well it is at the moment, but is said to be on the block, (UN No 9) - has introduced a range of electronic mail systems for work group, enterprise-wide and global networks. It is demonstrating version 3.0 of the InBox and InBox Plus electronic mail software and a set of gateways to private and public mail systems for MS-DOS and Apple Computer Inc Macintosh computers. The software is claimed to cost from $25 per user; InBox Plus gateways to be offered will connect to IBM Profs, DEC All-In-1 and VMS Mail, and SMTP on Unix-based systems. A DASnet gateway provides a connection to more than 50 other mail systems, and InBox can exchange mail with local-net-based electronic mail systems for Novell NetWare, 3Com and Banyan networks. InBox 3.0 is $330, InBox Plus $1,000, both available January.

Software Architects Inc, a Bothell, Washington specialist in hooking SCSI peripherals to the Mac, has come up with drivers for attatching optical drives to Apple's A/UX-run widget set. The new software, dubbed FormatterTwo and priced at £375 each, should work with Sony, Ricoh and Mac Optics drives, though Sony is the only company producing the things in volume as yet. Software Architects sells its stuff mostly to systems integrators and figures it stands to get a piece of the recent US Air Force order for a possible 80,000 Macs over the next five years.

TOOLS

The Intel 80860 OS/2 Software Development Tools is a program containing the software tools required to develop applications for the application accelerator busmaster card, PS/2 Wizard Adaptor, (see page 5). It increases performance by adding an 80860 microprocessor for advanced, numeric-intensive applications. The Tools comprise an assembler, linker, simulator debug facility, C compiler and C libraries, with access to all 80860 microprocessor capabilities. Intel plans to announce a similar toolkit for OS/2 Fortran applications in the second quarter of 1990, which IBM will remarket. Special support will be provided by IBM to registered software developers for a limited time, via a Limited Availability Developer Support Programme. There is limited availability from December 29, with full availability in the second quarter of 1990, and a one-time charge of $1,475.

Metier Management Systems, Hayes, Middlesex, has launched a new software package - Adept - that supports the UK government's Prompt methodology, and the new Prince structured methodology for the control of IT projects from the first quarter of next year. It is based on the Artemis database language, and follows three years of work between Metier and the CCTA developing an automatic planning and control system integrating Prompt with SSADM. Adept operates in conjunction with Artemis 2000 or 7000 and runs under Unix, VMS or on PCs - inclusive prices for Artemis with Adept start at £1,600.

Graphics software outfit V.I. Corp, Amherst, Massachusetts, has introduced a new version 7.0 of its object-orientated DataViews toolset for developing graphical user interfaces. The new release includes a menu handler, allowing developers to choose from a set of pre-defined input objects. Unlike other interfaces - such as Motif and New Wave - DataViews provides facilities for output in addition to input. DataViews 7.0 is available running under X-windows, on VMS, Ultrix, and Sun and Hewlett-Packard workstations. It will be running under AIX by the end of the year and supports all Risc processors and Intel 386 based PC systems. Price is £14,700, and upgrades are free. DataViews was used by scientists at NASA's Jet Propulsion Lab to produce two-dimensional real-time displays of the Voyager II spacecraft's recent encounter with the planet Neptune. Three-year-old V.I. reckons to have sold over 2,000 DataViews licences, and has a marketing agreement with Concurrent Computer Corporation - formerly Masscomp - which goes back to March 1987.

Concurrent Computer Corp has launched a Cobol development software package called CoDE which it claims can improve the efficiency and performance of Cobol applications by more than 75%, while cutting development time. CoDE is based on the Micro Focus Cobol product set including as it does a Cobol compiler and interpreter, Animator symbolic debugger, Forms-2 package, a performance profiler, utilities and additional tools, but it differs from it in three main ways: firstly Concurrent had to write a new code generator for its chip set, translating the Micro Focus Cobol intermediate code into Concurrent's object code. Secondly changes had to be made via the pre-processor to the compiler itself to provide an easy conversion path for users of Concurrent's proprietary Cobol compiler. Finally run-time changes have been made so that the Micro Focus symbolic debugger runs within Concurrent's Reliance transaction processing package. CoDE's performance is achieved because it compiles and debugs in intermediate code, rather than having to go into binary to reach the hardware. The intermediate code can be interpreted directly providing a quick turnround, since code can be compiled and seen executing. In this way run-time errors or logic errors can be spotted in the intermediate code by running Micro Focus' Animator which displays source code line by line on screen. In other words, CoDE has a fully functional symbolic debugger enabling the programmer to execute one part of the code, highlight it and see the output beside it. CoDE is designed for real-time applications such as securities and trading systems, banking, health-care, government services and insurance. It runs under Concurrent's proprietary OS/32 operating system as well as under real-time Unix and is available direct from Concurrent. There is a tiered pricing structure for the set depending on the processor the developer uses.

COMMERCIAL DEVELOPMENT

Concurrent Computer Corp, whose European base is in Maidenhead, Berkshire, has released a new banking system. The "Globus" system runs under real-time Unix and dealing support is supplied on the Information Display System through a series of windows, the idea being that the rows of terminals currently required by financial dealers will be replaced by a single workstation installed at each desk. A multi-function workstation option enables Globus applications to be combined with word processing, telex, video display, spreadsheet and other services on one terminal. Transaction modules for Globus include foreign exchange, money market, funds transfer, commercial loans and securities packages, each of which provide real-time access and the ability to update information on-line, while a multilingual facility allows the screen text and help prompts to be received in a language selected by the user. Globus supports X25 and all the major networking protocols. The hardware for Globus is being produced at the Concurrent factory in Cork, while the software, now licensed by Concurrent, comes from its Slough plant. Already installed at various pilot sites, the Globus system, which is available now at a typical system cost of £750,000.

The hotels division of SAS Scandinavian Airlines has installed a real-time, networked reservation system at its Oslo headquarters on a Sequent 81 system running Unix, linked to its 25 hotels around the world, each of which has Tandem LXN and EXT10 systems, for processing and network communication and links to other reservation systems. The EXT10 supports the first six levels of OSI, whilst the seventh level - which relates to applications software - resides on the Sequent box. The company chose Tandem systems house Computer Business Consultants Ltd, Borehamwood, Hertfordshire, to develop software enabling Tandem's Guardian operating system on the EXT10 to communicate with Unix on the Sequent, and to offer multiple interfaces to the local and remote processors and databases - a file and transaction switching solution known as Transport. This has links to all the major airline networks and to Unix.

WHEELIN' AND DEALIN'

Super news - **Thinking Machines Corp**, the Cambridge, Massachusetts firm that specialises in massively parallel supercomputers using very simple custom processors, has been awarded a $12m contract by the US Defense Advanced Research Projects Agency to try to develop the first machine to operate at up to 1,000 GFLOPS. It'll have up to 1m processors - but won't hit the streets until the mid-1990s.

Not so super - **Evans & Sutherland** has thrown in the towel on its effort to diversify into supercomputers with the moderately parallel ES-1 - it will close the business in 60 days if no buyer emerges. **Amdahl** has abandoned its efforts to market **Fujitsu Ltd**'s VP scientific supercomputers after selling no more than a dozen of the machines, most of them in Europe. **Prisma Inc**, the Colorado Springs company that planned to do a supercomputer built around a Gallium Arsenide implemetation of Sun's Sparc processor has thrown in the towel and closed its doors - all 45 employees have lost their jobs. But there is still going to be a Gallium Arsenide version of the Sparc - Sun has licensed **Systems & Processes Engineering Corp** to do one for use in satellites and probes, ground stations and image processing and analysis.

Only gloomy news to report on the computer industry jobs front this month. 23,000 people lost their jobs in October, against 24,200 for the whole three months of July to September. 330 more positions are being eliminated at **Apollo** in the US following its acquisition by **Hewlett-Packard**, 135 will go at **Interleaf**, 40 are going at **Datapoint Corp**, and **Norsk Data** in Germany is shedding 30 of its 400 staff. In the UK, **Apricot** has fired 175 staff at the country's last independent minimaker **ITL Plc**, the company it is in the process of acquiring.

Hewlett-Packard is working on fault-tolerant and multiprocessing machines built around its Precision Architecture Risc processor, for introduction next year. And **IBM** has an experimental multi-processor workstation with eight 25 MIPS Risc chips, developed in conjunction with, and running, **Carnegie Mellon University**'s skinny Mach multi-processing Unix kernel.

Nixdorf is to add the forthcoming S2 fault-tolerant three processor **Mips Computer Systems**-based Risc machine from **Tandem** to its product line, but Klaus Luft, who has been groomed to succeed Heinz Nixdorf as chairman of the firm has shocked the board by tendering his resignation.

Goldstar Co Ltd, part of the **Lucky Goldstar** group of Seoul, South Korea, is the latest Far Eastern manufacturer to commit to building Unix machines using **Sun's** Sparc processor - first systems will be available late next year.

Pyramid has signed up with **Systech Corp** for $10m of its Unplug terminal input-output control subsystems for use in its MISserver systems.

AT&T Co has made its first positive move in the direction of **Sun**'s Sparc processor - but it is a pretty tentative one: it is to buy Sparcstations OEM to front-end its Pixel Machine graphics processor.

ICL is to supply an office automation system for the Ministerial Cabinets of the **Portuguese Governemnt** in a deal worth £3m and involving over 4,000 employees. And in the end of an era, ICL has vacated Bridge House, situated on the picturesque banks of the River Thames at Putney Bridge - central headquarters are located in Bracknell, Berkshire.

NCR Corp is reported to be involved in the effort to produce an ECL version of the **Motorola** 88000 Risc processor along with **Data General**.

Nokia Data Systems has signed to distribute **Network Computing Devices'** range of X-Windows display terminals in Sweden, Norway, Finland and Denmark.

Sun is looking for at least $10m during the first year of a deal it has struck with **Arthur Andersen Consulting** which is to remarket Sun's entire line of computers and software under commercial systems integration contracts.

** LATE NEWS **

SUN UNVEILS FIRST PURPOSE-BUILT SPARC SERVERS

Sun Microsystems has expanded its server range with the launch of two new products, including a low-end SPARCserver 1 and a new top-end system - the SPARCserver 490 - which is Sun's first server system to be purpose designed rather than derived from its mainstream workstation line. The SPARCserver 490 uses the 33MHz Cypress implementation of Sun's SPARC processor, rated at 22 MIPS and 3.8 MFLOPS double precision, and includes a more powerful input/output subsystem with a 64-bit memory bus capable of sustained throughput of 120 Mb/sec, a new Sun-patented I/O cache, and higher speed VMEbus that supports I/O transfer rates of 22 Mb/sec. The box is intended as a general purpose file, database and compute server, and the boosted I/O allows the system to take advantage of Sun's Intelligent Peripheral Interface (IPI) disk drives, first introduced with the SPARCserver 390 last April. A new memory management system increases context switching speed, allowing the server to also act as a multi-user system for up to 130 terminals - typically, the machine would support from 30 to 200 network users, depending on the mix of workstations, PCs and terminals in use. A system including 32Mb of main memory (expandable to 160Mb ECC memory) and 1Gb of IPI storage costs £89,400. The Sparcserver 1 is aimed at workgroups of between 5 and 15 users, and has the same 20MHz, 12.5 MIPS SPARC from LSI Logic used in the SPARCstation 1. With from 8-16Mb memory, up to four external 327Mb external disks, three SBus expansion slots, support for the new SunCD ROM storage unit and 150Mb tape backup, the system is claimed to be as fast as the DECsystem 3100 server but 40% cheaper and with 10 times the applications, according to Sun. Cost is £16,900 for a system with 8Mb main memory, 654Mb disk storage and 150Mb tape. Database vendors Informix, Ingres, Oracle and Sybase supported the launch.

HP EXPANDS ON ITS 1990 RISC PLANS

Hewlett-Packard Co, which early last month was already promising fault-tolerant multiprocessor models in its Precision Architecture RISC-based families for next year has amplified on its plans. As well as promising much enhanced transaction processing software, Hewlett said that new CMOS versions of its RISC will more than double the performance level of the company's current top-end HP 3000 Series 960. The new chip set will be available as a board upgrade on both the HP3000 MPE and HP9000 Unix systems; a workstation version of the chip set is nearing completion, with product-specific details to be announced in the second half of 1990. HP says its design technology enables it to put its entire RISC on a single chip, thereby at least doubling the performance of its minicomputers and workstations: the chip is about 2" square and integrates nearly 1m transistors; it has 400 pins and will be fabricated in 0.8 micron CMOS; it will draw less than 10W of power and will offer clock speeds greater than 48MHz; HP claims that integer performance will reach 50 to 60 MIPS and floating-point performance 12 MFLOPS to 16 MFLOPS; the chip will go into machines that will be priced at between $12,000 to $1m for high-end multiprocessors and a key feature is the capability to build in different cache designs depending on whether the chip is destined for workstations that will be required to do intensive floating-point operations or for integer-intensive business applications.

PCs VERSUS UNIX WORKSTATIONS - STILL A FIXTURE FOR THE FUTURE

Don't hold your breath. The long-anticipated marketplace confrontation between 386-based PCs and high-performance Unix workstations may be further off into the 1990s than most marketeers and industry watchers currently expect. Analyst Craig Whitney of Computer Intelligence Corp (CI) of La Jolla, California, last week told a packed Comdex session on PCs versus workstations that a recent survey of 100,000-plus PC and 42,000 workstation end-users revealed little overlap in usage in industries that buy PCs and workstations, respectively, in the last three to six months. Users still buy PCs primarily for word processing and spreadsheets, while workstations - Unix or otherwise - are used for software development, and CASE, CAD/CAM, graphics, imaging, mechanical CAD, engineering, research, education and other technically-oriented applications. So while 386 PCs and Unix workstations may overlap in price and performance, Whitney said, they don't in applications. And users won't shift buying patterns for PCs and workstations by application or industry segment any time soon, indicating that a confrontation between PCs and workstations is far off. Interestingly, CI's data also revealed one big reason why OS/2 and Micro Channel Architecture have not taken off. 286-based systems comprised 39 percent of all PC purchases in the last six months, while 386-based systems totalled only 7 percent. Indeed, the two top-selling systems in the last three months were the 286-based PS/2 Model 50 and the 8086-based Model 30. "Users are still pretty happy with 286 systems," said Whitney. "Users have more horsepower than they need." And although Sun held a commanding lead among installed workstations users, with 34 percent, Whitney said 45 percent said they intended to purchase DEC equipment in the following year - mostly VMS-based VAXstations, not Unix-based RISC systems.

PERSONAL COMPUTER USERS GET MUCH THE BEST DEAL IN THE UK

UK users, seeing the dollar sign on personal computer prices simply replaced by a pound sign, may feel hard done by in comparison with their US counterparts - but spare a thought for continental users. The Catalan User Institute in Spain has been comparing prices across Europe for personal computers, and finds that continental users have to pay from 39% to 102% more than those in the UK. West German prices were found to be 39% higher, Belgian users paid 44% more, in France they pay 62% more, and in Spain the mark up is an extortionate 102% - and the Catalonians complain that not only are the Spanish users stung, but their siblings in other European countries get much better after- sales service. Spanish users feel particularly aggrieved that their country is often chosen as a low-cost manufacturing base, with their taxes going to pay the inducements to foreign investors, who then proceed to rip them off with overpriced products. The survey covered personal computers costing from 500 to 2,000 European Currency Units - an ECU is worth a little more than a dollar - and all prices were converted into ECUs for consistency. The survey covered 60 different machines in each country, fitting a range of specifications.

MORE HARDWARE AND SOFTWARE NEWS

OFFICE AUTOMATION

DOS software house Borland International has teamed up with Hunter Systems Inc of Mountain View, California, to bring its Quattro spreadsheet and Sprint word processor over to the Unix market. Hunter Systems is to use its XDOS CAPS computer-aided-porting system to develop XDOS versions of the Borland products, allowing them to run on any machine supporting the Hunter XDOS Transformer utility. These currently include most Motorola 68000 and Intel 386-based systems, with RISC versions currently under development. Quattro Version 1.0 and Sprint for Unix will be sold with the original user documentation and XDOS application programs on Unix media, such as cartridge tape and 3 1/2 inch Unix formatted floppies. Hunter will supply Unix and XDOS related support. Sprint will cost $239, and Quattro $299, when the products become available by the end of the year.

Hewlett-Packard Co has laid down the gauntlet to IBM with OfficeVision and DEC with All-In-1 by introducing HP NewWave Office, an integrated office system for its MPE-V and MPE-XL HP 3000 machines, HP-UX, and OS/2 and which brings together some 15 new or enhanced capabilities. Designed to enable users to integrate systems and applications from multiple vendors, the system is already supported by "over 60 software developers and resellers" which are contributing a full range of word-processing, spreadsheet, database, graphics, communications and multimedia applications, as well as vertical market applications. The major components of HP NewWave Office are the existing NewWave environment, designed to offer a consistent graphical user interface and integration of existing and new applications on micros running OS/2; information services, which provide access to a range of data sources and electronic mail over public and private networks; and system services for networked personal computer management and sharing of computer resources. Pricing ranges from $1,300 for a four-user licence to $84,210 for multi-user-server licences, depending on the services bought and the size of the system, and there is a choice of user-based and system-level pricing.

Asset Technology, Cobham, Surrey, has launched an office communications package called Ceemore, which allows users to send and receive messages and other material across a range of media from their terminals, and integrates with other office automation software. It runs on Unix and can transfer written material and graphics - electronic mail, fax, telex and files - from a single user interface. It can access external facilities such as Prestel, X.25, Ethernet, Telecom Gold, One-to-one and Mercurylink, as well as X.400 via a Xionics gateway. Ceemore is £495 on a PC running Xenix.

WORKSTATIONS

DEC has boosted the power of its Model 3100 VAXstation line with two new models using the latest 60nS cycle CMOS version of its CVAX processor, already used in the faster MicroVAX models. The new Model 38 and 48 systems join the 90nS Models 30 and 40, adding 30% more compute power at a 12% to 15% higher price. Prices range from £9,000 for the Model 38 up to £30,000 for a fully configured Model 48 - available immediately. The company rates the 38 and 48 at 5.1 VAX MIPS against 3.7 VAX MIPS for the 30 and 40. DEC is also offering real-time versions of the Model 30 and Model 38 that include the VAXeln real time operating system.

Sun Microsystems is still being rather coy about when we will see an 80486-based addition to its workstation range. The bug found in the microprocessor by Compaq Computer will have certainly deferred any possible announcement to later rather than sooner, with volume shipments of the part now not expected until well into next year. However for those unable to wait, Sun has an 80486 board upgrade for its 386i workstation which it says increases performance by 2.5 to four times. The new board includes a 25MHz 80486 - rated at a rather tame 12 MIPS - and enhanced input-output components. It costs $5,000 in the US, or £4,000 in the UK, available from the the second quarter of 1990. Sun has also cut 386i prices; the 8Mb 386i/250 with 16" colour monitor and a 155Mb disk is cut 10% to $16,490, effective immediately.

SYSTEMS

Arnet Corp of Nashville, Tennessee, has come out with three multi-user systems. The Multiuser 486 comes with a 72Kb cache memory and runs three times as fast as the company's Multiuser 386 system and is intended for applications involving 20 users or more. Two multiuser 386 systems, based on a 25MHz and 33MHz 386, respectively, come in standard configurations of 4Mb of main memory, a 150Mb tape drive, a 101-key keyboard, and monitor. The 33MHz system has a 150Mb hard drive, the 33MHz a 330 Mb drive. Arnet said that the Multiuser 386 system can accommodate up to 64 users. All Arnet Multiuser systems can run Unix, Concurrent DOS, and the MUMPS operating systems.

Nixdorf Computer's UK subsidiary has begun the task of upgrading its Motorola-based Targon line with new 68030 systems, a task it began in Germany as long ago as March 1988 The first system out in the UK is the 32 user Targon /31 M15, which by using a single board design to host the 33MHz processor, performs at 5.5 MIPS. Also on the board is a Motorola MC68882 maths co-processor and 32Kb of on-board cache. Upgrades can be carried out on site, and main memory can be expanded from 8Mb to 24Mb by adding a 16Mb memory extension board. By using a new Asynchronous Terminal Controller, up to 64 terminals can be connected, although usage is limited to 32 concurrent users. A disk capacity of up to 2.1Gb is managed by a MC68020 input/output processor.

And Nixdorf Computer AG, which already buys Unix processors OEM from Pyramid Technology Inc and Mips Computer Systems Inc, is to add the forthcoming S2 fault-tolerant three processor Mips RISC-based system from Tandem Computers Inc to its product line.

Data management and analysis specialist SPSS has produced a version of its SPSS-X software that runs on the Mips Risc-based DECsystem 5400 and 5810/5820 running under Ultrix: now available in the UK, the cost is £4,000 and £7,400 respectively.

Leeds-based **VisionWare**'s XVision software, (UN No 9), which allows a PC to serve as a LAN workstation and as a Unix-based X-Window server, is now available from Unix specialist house **Sphinx Ltd**, Maidenhead, Berkshire - it costs £350.

Intel Corp is now offering a system level 80486 processor: the AT-bus Intel 486 MicroComputer Model 401 is offered in a floor-standing version with 8Mb of 80ns memory and 8Kb of cache with room for eight half-height 5.25" devices and eight expansion boards and is £11,600 with 170Mb Winchester, cartridge tape and 3.5" and 5.25" floppies.

Dallas, Texas based **Pernetix Inc** has some new software that allows MS-DOS users to access Unix using DOS commands, and Unix users to access DOS using Unix commands - PCs are linked using Pernet/pc, which goes from $2,000 to $4,000 for 8 to 24 users, Unix users through SMB/ix, which costs the same - the networks are connected through NetBios programming interfaces.

Bedford, Massachusetts-based **Interbase Software Corporation** has released version 3.0 of its relational database - InterBase - incorporating distributed processing capabilities, for hardware running HP-UX, VMS or Ultrix, as well as on Sun workstations: new features include event alerters, blob filters, array support and user defined functions - prices go from $5,000 to $100,000 depending on configuration.

The French Ministry of Equipment, Transportation, Lodging and Sea - **Melatt** - has chosen **Informix**'s SmartWare II as its office automation package, in what Informix reckons is its largest single office automation license sale in its history, the installation will take three years to complete.

Raleigh, North Carolina-based **Yourdon International** 's Case tool - Cradle - which supports Yourdon's own structured methodology, YSM, is now available on Sun and Apollo workstations; it will run under X-Windows and across TCP/IP, cost is £3,000 per user: and Yourdon's Analyst/Designer toolkit now runs across Netbios-compatible networked PCs - the multi-user version starts at £3,000.

Perihellion's Helios parallel programmimng environment is now available on Sun-3, -4 and 386i workstations with Inmos, Parasytec or Transtech transputer boards - prices start at £1,750, from **Distributed Software Ltd**, Bristol.

The inaugural meeting of the **European X User Group** was held at the Institute of Electrical Engineers in London last month, with over 200 xthusiasts turning up to set the thing in motion. Niall Mansfield of Unipalm Ltd, Hardwick, Cambridgeshire was elected chairman and a newsletter is planned before the end of the year. An exhibition and seminar session is penned in for Easter, to be followed by a full conference and exhibition in the Autumn. The group hopes to establish similar bodies on the continent, and links with the X User Group in the US. For more information telephone 0954 211797.

International Data Corp has been looking at desktop Unix systems running commercial applications, and reckons that at the end of last year there were just over 1m such systems installed worldwide: 42% were running Xenix or another personal computer Unix on Intel iAPX-86 family systems; 26% were running Unix System V; 13% were running one or other of the three Berkeley versions; 6% were Hewlett-Packard HP-UX systems; 5% were Apollo Computer's Aegis, which now adds to the Hewlett-Packard total; 3% were DEC's Ultrix on MicroVAX; 3% were IBM's AIX; leaving 2% for others.

Acorn has reduced the price of a complete R140 system - with hard disk, Ethernet, PC emulation software and 19" monitor - to £2,999.

Ofis Systems Ltd, Southampton, Hants - the Unix software division of the **Business Management Group** - has a new accounting package for Apple Macintoshes: Ofis Manager is written in Informix 4GL and runs under Unix and Apple's A/UX - cost is £350.

Informix Software Inc says that it plans next year to offer versions of its Wingz graphic spreadsheet for the NeXT Computer System, for OS/2 with Presentation Manager, for MS-Windows, an Open Desktop Wingz for the Motif interface and Wingz for Unix workstations; it is presently offered on Mac under A/UX.

Sun Microsystems Inc says it will establish its International Centre for Network Computing in France. It will develop new products for the SunNet line, initially at the Sun France base in Boursidiere: it looks to have 38 staff by end-1990.

Motorola Computer Systems and **Logitek Plc** have signed a marketing agreement under which Logitek is to be Motorola's primary UK commercial distributor for its Delta 8000 series of 88000-based RISC Unix boxes.

The First European Conference on the **Practical Application of Lisp, Europal '90** is to be held in March 1990 at Cambridge, England: the conference wants to popularise the capabilities of Lisp as a programming language, as well as emphasising its role in the development of the next white hope, object-oriented systems; people wishing to participate in Europal '90 by attending or giving papers should contact David Lloyd at Applied Workstations Ltd, Dorking, Surrey.

Sun Microsystems is to distribute **Verdix Corp**'s Ada Development System - VADS - on all of its workstations in an agreement signed with the Chantilly, Virginia company last week: VADS includes a compiler, debugger and program generation tools.

Bristol-based software house **Ampersand Systems Ltd**, is to offer Unisys users Pick applications on their Unix systems through its 4GL called &Pace, it can build packages within the Pick environment which can also be run under Unix.

Sun Microsystems, Xios Systems and **Systems Union** have teamed up to offer Sparc based solutions for the City and financial institutions. Systems Union has enhanced its SunSystem package for porting across Sparc servers, which will also run on Xios hardware.

88open - the supporters club for Motorola's 88000 Risc architecture - has set up its first European porting centres at **Motorola**'s Maidenhead Berkshire operation, **Data General**'s offices in Frankfurt, West Germany and **Norsk Data's Dolphin Server Technology** spin-out in Oslo, Norway.

Apricot Computers, Birmingham, is to support **3Com Corp**'s 3+Open Lan Manager on its 80486-based VX FT range of servers - a kit is available from this month, priced £195.

Copies of the **Posix Conformance Test Suite** - FIPS-151 - are now available from **Microinfo Ltd**, Alton, Hants, which is distributing them in the UK for the US National Technical Information Service .

Tadpole Technology, Cambridge has a new 8Mb version of its 68030-based TP32V VME board, available in 20MHz, 25MHz and 33MHz configurations: prices go from £2,750 to £4,945.

Informix Software Inc has Unix versions of its SmartWare II office automation software in the pipeline, which will provide DOS to Unix connectivity for all Smart facilities - SCO Unix and Unix V.3.2 versions will ship in the fourth quarter.

CONTACTS

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UNIX NEWS

UNIX NEWS is published monthly by Unigram Products Ltd, 4th Floor, 12 Sutton Row, London W1V 5FH.

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Subscription orders: £55 per 12 issues. Enquiries and payment to Unigram Products, 4th Floor, 12 Sutton Row, London W1V 5FH.