Patricia Seybold's

UNIX IN THE OFFICE

VOL. 4, NO. 1
ISSN: 0887-3054
JANUARY 1989

INSIDE

PRODUCTS • TRENDS • ISSUES • ANALYSIS

Unisys Ofis Ensemble

In Search of Cohesion

By Laure Brown

TWO YEARS AGO, when Burroughs and Sperry merged with plans to integrate their various product lines, the industry responded with skepticism. Integrate Burroughs and Sperry proprietary platforms, DOS, and Unix? Assimilate two inherently different corporate cultures? Develop compatibility among so many products without abandoning established systems? Yeah, right. Even if Unisys were to manage *(continued on page 3)*

• E D I T O R I A L •

Executive UniForum

By Judith S. Hurwitz

UNIX HAS HIT the big time. Every vendor planning to be around for the next decade (or at least the next half-decade) has committed to developing a Unix strategy. Some may even develop Unix hardware and software. Applications vendors are beginning to port their latest and greatest applications to run under Unix.

Why the flurry of activity? All the market research indicates dramatic growth for Unix. International Data Corporation (IDC) is projecting that, by 1992, the dollar value of Unix shipments will be worth $13.88 billion, or almost 21 percent of all computer shipments. This compares to the company's estimate of $4.46 billion for 1987. In order for these numbers to be realized, Unix will have to appeal to the commercial user, not only to the scientific and engineering audience that already knows and loves Unix.

While the Unix vendors understand the new opportunity for competing in the commercial sector, the commercial users are not jumping onto the Unix bandwagon en masse. Instead, users are slowly and cautiously moving to Unix. Two types of commercial users have already committed to Unix: pioneers who saw the advantage of portability before it was fashionable, and those who installed Unix without even knowing that an operating system was there at all. The second group includes, primarily, users who purchased systems from a VAR that installed a turnkey system which bundled hardware and vertical applications. If you pointed out to these users that they are running Unix, they would be quite surprised.

What is needed for Unix to become commonplace in the average data processing organization? First, it must have the same level of facilities and tools that are available in commercially acceptable operating systems, such as IBM's VM or Digital's VMS. Users need diagnostic tools, good security (Unix's limitations in this area are all too clearly demonstrated by the recent security breaks in the Unix-based TCP/IP DOD network), backup, and so forth. We believe that these types of tools are becoming available under Unix both from the traditionally proprietary vendors that are beginning to offer Unix systems and from third-party software developers that see a new potential market for their wares.

So what needs to be done to attract these users to try Unix? By and large, they do not know much about this operating system and do not have the same appreciation for its power. Therefore, they must be made comfortable with the fact that Unix is indeed a viable alternative to proprietary operating systems. In brief, these users need information. Ironically, there are not many places where Unix neophytes can get the information they need. Traditional Unix conferences and expos meet the needs of educated consumers. But MIS management is caught in a bind. On the one hand, they are technically sophisticated professionals who could figure out Unix pretty quickly; on the other, they don't need to know bits and bytes, but rather what the major computer vendors plan as their Unix strategies.

Against this backdrop, we at Patricia Seybold's Office Computing Group are planning a conference to address the needs of the emerging commercial Unix user: The Executive UniForum Symposium. Our conference director, Connie Sagona, would be furious if we didn't tell you that the conference will take place April 26-28 in Santa Barbara, California. We are very pleased to be jointly sponsoring this event with /usr/group, the premier Unix user organization. Our goal for this first annual symposium is to provide a forum where the key vendors and business users can exchange information about how and why they are implementing Unix.

We are working to solidify our program for this first event, and we are looking for input and suggestions. So call us. Talk to us. Tell us what issues you think we should be addressing. We want this conference to spotlight the concerns and desires of the growing commercial Unix community.

See you in Santa Barbara!

Patricia Seybold's Office Computing Group

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Patricia Seybold's UNIX in the Office (ISSN 0887-3054) is published monthly for $495 (US), $507 (Canada), and $519 (Foreign) per year by Patricia Seybold's Office Computing Group, 148 State Street, Suite 612, Boston, MA 02109. Application to mail at second-class postage rates is pending at Boston, MA and additional mailing offices. POSTMASTER: Send address changes to *Patricia Seybold's UNIX in the Office*, 148 State Street, Suite 612, Boston, MA 02109.

•UNISYS•

(continued from page 1) such an undertaking, who's to say it would fly? With the exception of its Unix line, the company offered mainly proprietary products and could do little but cater to its installed base.

Enter open systems. Unisys decided to employ standards to leap over its proprietary confines, and Unix was the obvious migration platform. Unisys wisely regarded Unix as a corporate player from its inception (before the idea came into vogue) and targeted the platform thus. In 1987, Unisys reached Unix revenues of $500 million. Unisys has 10,000 Unix processors installed, the majority of them in commercial markets.

Based on this success, Unisys plans to expand and enhance the base. The company has taken several steps to solidify its commitment to standards. Unisys chairman Michael Blumenthal has been an outspoken advocate for one standard Unix and a champion of Unix International (formerly the Archer Group). In addition, the company is a member of X/Open and is actively pursuing more advanced Unix applications software such as procedural automation and compound documents (see "Advanced Features" below).

As businesses increasingly demand multivendor interaction, the industry is embracing standards. If Unisys wants to bridge its different hardware platforms and succeed beyond its installed base, it needs to adhere to standards as closely as possible. And it is. The company is committed to interconnectivity and interoperability with non-Unisys platforms. Already implemented are ISO X.400 mail protocols, TCP/IP, and interconnection to IBM standard environments (DISSOS, SNA, SNADS, PROFS). There's more on the drawing board, including ODA/ODIF compliancy, X.500 implementation, a standard common interface across all platforms based on Presentation Manager (including PM/X, the Unix version of Presentation Manager), and a standard RISC architecture (although Unisys licensed the SPARC chip from Sun, it doesn't necessarily plan to standardize on SPARC).

PEOPLE POWER. If the products dovetail as nicely as the employees have, Unisys has some fat years ahead. The first step toward a solid, compatible product line started in the ranks. To solidify the corporate culture, Blumenthal sent Burroughs people to work on Sperry products, and vice versa. The result was a tenacious partnership and vision. And enthusiasm. The attitude of the company representatives we met with at the Unisys headquarters in Blue Bell, Pennsylvania, was infectious—they were psyched. Of course, whether or not that mood has permeated through to the 93,000 worldwide employees, we can't say. (A corporate culture starts at the top; perhaps it takes a while to trickle down.)

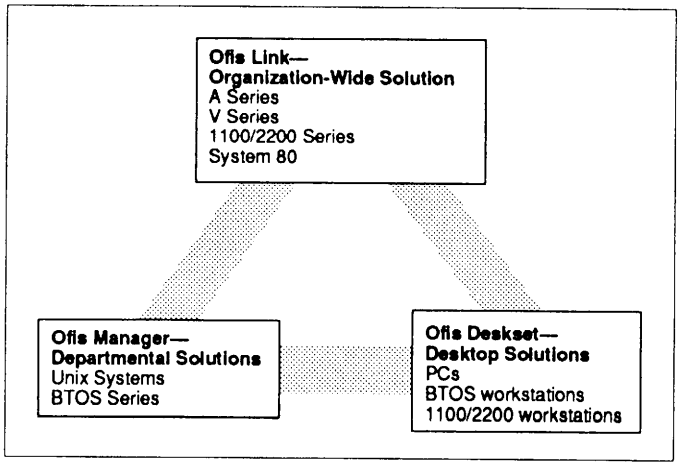
The Strategy

The motivation driving these efforts is the Unisys goal of doubling its income and becoming a $20 billion company by 1991. How? Growth and acquisitions. There was the purchase last summer of Convergent Technologies (CT), a Unisys hardware supplier. In that deal, Unisys also acquired Paul Ely, who, as CT president, had left a key position at Hewlett-Packard. Ely should play a critical role in the overall management of the Unisys Unix strategy.

CONSOLIDATION. Unisys understands that functionality must transcend all its products. If the company were starting from scratch, it would probably design leading-edge technology and have it available on all platforms at once. However, Unisys had to deal with a large number of incompatible office products whose functionality ranged from mediocre to fair. But it is a pragmatic company. It took what it already had and made the best of it. Unisys, therefore, created a structure that could accommodate all its existing software. Ofis Ensemble is that structure.

Ofis Ensemble is part of the Unisys answer to SAA. Unisys, like IBM, needed to unite its various closed systems and architectures. In effect, Unisys has taken the products it was stuck with at the time of the merger and built a framework around them to give them the appearance of a cohesive environment. Therefore, in the short run, Unisys will use as many standards as possible to mask system differences: Presentation Manager for user interface on all platforms, X.400 and X.500 communications protocols, and Ofis Ensemble for office applications.

Ofis Ensemble consists of three tiers: Ofis Link, for organization-wide, mainframe computing; Ofis Manager, for departmental computing; and Ofis Deskset, for personal computing. (The box on page 4 describes Ofis Ensemble products in detail.) The idea was to group applications that offer similar capabilities, regardless of their demand for different architectures. Thus, none of the proprietary applications were scrapped—in deference to old Sperry and Burroughs customers who feared their investments would go down the tubes—but now they have the appearance of cohesiveness.



Ofis Ensemble consists of three tiers: Ofis Link, Ofis Manager, and Ofis Deskset.

Unisys Software Products

Making Sense of It All

OFIS ENSEMBLE IS the blanket under which Unisys is integrating its office products—all the various programs that run on all the various platforms. All personal productivity tools are wrapped into the Ofis Deskset category. Workgroup communications fall under the domain of Ofis Manager, while organization-wide communications belong to Ofis Link.

Sure, it sounds great, but it's confusing. Different products have wound up with the same name (e.g., the features found in the Unix and BTOS versions of Ofis Manager differ considerably). And products in the same category don't necessarily interact in any way. A rundown of Unisys offerings should make things clearer and put the company strategy in better perspective.

OFIS LINK. Ofis Link provides organization-wide communications and resides on Unisys mainframe architectures. These include the A and V Series, 1100/2200 Series, and System 80.

- Ofis Link A/V Series ties to Ofis Deskset BTOS for word processing (although it also supports DOS word processing packages) and to Ofis Manager BTOS for electronic mail access. It maintains files and administrative services and comes with an API (Application Program Interface) for application developers.
- Ofis Link 1100/2200 is a descendant of Sperrylink. It ties to Ofis Deskset DSSP (Deskset Station Support Package) for word processing. It also does list processing, and its electronic mail link provides document conversion to Ofis Manager Unix and BTOS. Ofis Link also hooks into a few external mail systems (Easylink and E-mail). Like the A/V Series version, it functions as the filing system and provides administrative services.
- Ofis Link System 80 offers features similar to its 1100/2200 counterpart; however, the code is different.

OFIS MANAGER. Ofis Manager baffled us at first. Unisys refers to it as the workgroup communications branch of Ofis Ensemble. But the Unix version seemed as if it should hang on the Ofis Deskset branch because it's a complete Unix office system with word processing, forms, calendar, spreadsheet—all the Ofis Deskset features. Then it hit us; Ofis Manager also has a mail system, and that's the difference. The BTOS product, on the other hand, made sense; it's communications only. Ofis Manager maintains shared services. The two connect via X.400 mail protocols.

- Ofis Manager Unix is the core Unix product for Unisys. It's an integrated office system, including word processing, spreadsheets, electronic mail, calendar, forms processing,

But Unisys envisions more than just an artifice. And, to be fair, the company has already put some interim pieces into place. For instance, it has licensed Locus's DOS-based, PC-Interface product to let PC users access Unix; it provides company-specific protocols that allow communication between mail systems (five different mail systems exist); and it has whittled the number of word processors down to three (from nine).

Unisys admits that Ofis Ensemble is software in transition. It should change drastically in the next two to three years. The company has taken a phased approach to its migration strategy, and it's still early. Common interfaces, mail, database, and services should all be realized by 1991, as well as access to Unisys's popular fourth-generation language tools, Ally, LINC, and Mapper.

Services. Another way of looking at Ofis Ensemble is by analyzing its three levels of services: global, office, and personal. Notice how each service level parallels an Ofis Ensemble tier of products.

Global services handle organization-wide communications. They include:

- DIA and X.400 service interfaces
- Library services
- Application processing interface
- Document distribution services
- Directory services
- Gateway to other mail systems
- Specialized output device services
- Program-to-program communications

Office applications provide workgroup communications, including shared services like appointment schedulers and office procedures:

- Time management (or meeting scheduling)
- Voice applications (e.g., voice response, voice store and forward, voice annotation, and text-to-voice)
- Forms processing

data processing, and procedural automation (see "Ofis Manager under Unix" below). It can serve as a local departmental system connected to Unisys mainframes.

- Ofis Manager BTOS is the proprietary mail component for the BTOS series. It's used for communications within a workgroup. It also connects to the larger BTOS machines as well as to Unix systems. The Ofis Bridge component of Ofis Manager provides the ability to exchange documents between Unisys and non-Unisys workstations via DISSOS.

OFIS DESKSET. Ofis Deskset comes in three flavors: PC, DSSP, and BTOS. Each covers desktop office functions: word processing, calendar, database, etc. The problem is that none of the products that fall under Ofis Deskset have the same word processor, calendar, database, or the same anything. They do, however, interface to other Unisys offerings, and they can exchange documents in DCA format.

- Ofis Deskset PC is a DOS-based office system, including word processing, calculator, phonebook, notepad, calendar, and forms. Ofis Deskset PC allows context-switching to applications of choice. It's real role, however, is to integrate PCs into the Unix environment. A set of file management functions and application services provides transparent compatibility between host and PC. The word processor and mail are fully compatible with the Unix version. Any document (e.g., Lotus, Word Perfect, binary files) can be mailed directly from the deskstation through the Ofis Manager Unix network. A VT-100/220 terminal emulator is bundled with the products, as is a remote drive facility that gives users access to the Unix file system.

- Ofis Deskset DSSP runs on all Unisys PCs. It's the old Sperrylink workstation package. It has its own word processor (LAN word processing is also available), calculator, records and list management, access to other DOS applications, and windows. It can also be used as a data processing terminal for applications 1100/2200 series applications via Ofis Link 1100/200.

- Ofis Deskset BTOS is a proprietary mini-based office system from Burroughs that generates rather crude compound documents (it's an early compound document editor; however, a new version will be available early this year). It includes word processing, forms generation, business graphics, drawing, spreadsheets, database applications, and mainframe connectivity.

- Procedural management
- Image processing

Personal services include those applications that can be executed on a standalone machine:

- Word processing
- Spreadsheets
- Document management
- Telephone messaging
- Forms processing
- Desktop publishing

Hardware. Unisys has 10 different hardware architectures where the Ofis Ensemble applications reside. Yes, that does seem like too many different platforms. Again, however, Unisys must maintain support for its installed base. Mainframe platforms include the A Series, V Series, 1100 Series, 2200 Series, and System 80. The middle-range machines are Unix (U Series) and BTOS minicomputers. Then there are workstations: PCs and BTOS proprietary.

Eventually, applications will be more flexible and run on various machines. At the moment, however, each software product is strapped to a specific architecture. (See the chart on page 6.)

ADVANCED FEATURES. One thing we found promising is the allegiance of Unisys to advanced features like procedural automation, voice annotation, and compound document architecture. The company is not losing itself in its consolidation challenge and ignoring directions in the marketplace.

Occasionally, however, these applications are a little rough around the edges (see "Ofis Procedures" below). Another hitch is that they are limited to specific environments: Ofis Procedures currently only runs on Unix, VIPS (Voice Information Processing System) and compound documents only on the BTOS Series. Unisys is planning to adapt these advanced applications to run on other systems as well. In the meantime, you can attach voice mail notification and voice response applications (i.e., voice prompts and telephone keypad responses) to any platform.

MARKETING. Unisys sees two marketing avenues: its installed customer base and new customers. It will use Ofis Ensemble to plug potential drains on its current mainframe and departmental system base. The right Unisys solution will stifle any trespassing by other vendors. For new accounts, Unisys is targeting the departmental level as the most likely area of market penetration, so it's stressing its departmental products—Unix and BTOS minicomputers and Ofis Manager applications and services.

Ofis Manager under Unix

We've spoken a lot about the Unisys strategy but very little about its current products. The products Unisys envisions are a good two to three years away, so we thought it a good idea to investigate today's Unisys Unix offering.

The current core Unix product is Ofis Manager Release 1.1 (Release 2.0 is scheduled to ship in February), which is based on Q-Office from Quadratron. Unisys bought Quadratron's source code and has modified parts of it substantially. (Good thing. Quadratron doesn't have that great an interface. See Vol. 2, No. 12.) The core product includes: electronic mail, forms processing, calendar/scheduler, document converters (DCA, Fortune Word, Wang, DIF, and ASCII), and personal services (which include a note pad, calculator, phone book, and phone messaging). Additional components—including a procedural automation program—also come under the Ofis Manager umbrella, but they are sold modularly. The complete package is adequately functional. It'll get the job done, but nothing about it will really "wow!" you.

System	Application	Original Company
Mainframes		
1100/2200 Series	Ofis Link 1100/2200	Sperry
System 80	Ofis Link System 80	Sperry
A/V Series	Ofis Link A/V	Burroughs
Unix (U Series)		
5000 (Includes Xenix)	Ofis Manager Unix	Sperry
6000	Ofis Manager Unix	Sperry
7000	Ofis Manager Unix	Sperry
Minicomputers		
BTOS Series	Ofis Manager BTOS	Burroughs
Desktops		
BTOS workstation	Ofis Deskset BTOS	Burroughs
1100/2200 workstation	Ofis Deskset DSSP	Sperry
DOS PC	Ofis Deskset PC	Sperry

Ofis Ensemble Systems and Software.

However, it may in the near future. Unisys has done considerable work in the past two years to get Ofis Manager up and running the way it does today. Unisys is certainly pursuing the right product directions, and we anticipate good things to come.

INTERFACE. The character-based Ofis Manager interface fares pretty well. Pop-up menus make it easy to work in Ofis Manager. Menu items are mnemonic—just hit the first letter of the item you want—but you can also cursor your way through them. No contextual menu defaults are supported, but, in some instances, your last choice is remembered (e.g., last folder and last document accessed). If you know the system well enough, you can opt for Expert mode. Release 2.0 fixed an annoying Ofis Manager idiosyncrasy of displaying menu items that the system didn't support. For example, in 1.1, we bumped into a voice annotation feature that couldn't be implemented from the system we were working on. In Release 2.0, you won't find such nonfunctioning functions.

The main menu displays various activities included in Ofis Manager, from retrieving folders to creating spreadsheets to invoking mail services. However, if you're into spreadsheeting and not much else, you can select the spreadsheet component directly from the Unix menu. The main menu also lets you know if you have any mail. If you're in an application, the system will beep at you (if you so choose) when mail comes in.

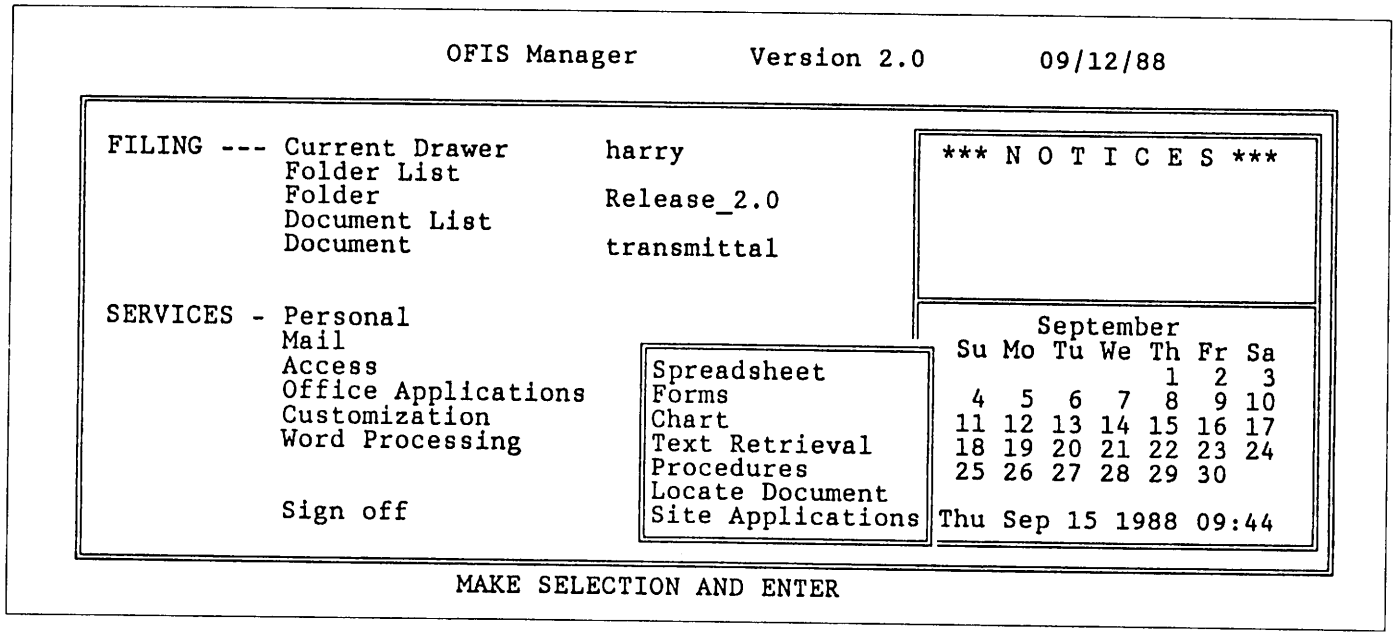
We liked the fact that the Unix operating system stays in its place (i.e., out of sight). All file management is done through the Ofis Manager interface.

Problems. Ofis Manager has some problems. For one thing, the interface isn't always consistent. Unisys has done most of its value-added in navigation between components and fixing obvious software bugs. Although some components have been enhanced considerably (the mail system was completely replaced), others still have a way to go. For example, the word processing component operates with those old-fashioned menus; you know—the kind that is displayed at the bottom of your screen, wasting a third of your work space. Unisys should finish the job and create a pleasant environment all the way through.

Furthermore, although Ofis Manager lets you work in Expert mode, you won't become an expert unless you're into manual-reading. Menus don't clue you in on corresponding commands, and commands are not intuitive.

Another small complaint: You manipulate the cursor in the calculator with the Tab key. Other functions use the Arrow keys, so why the Tab key with the calculator?

Help. On-line Help is adequate. Some menus provide context-sensitive Help. There's also an on-line Help template, so you don't have to go



The main menu displays the various activities included in Ofis Manager, from retrieving folders to creating spreadsheets to invoking mail services.

rooting around when you're not sure where something is. However, some things just aren't there. We stumbled onto something on the menu called "Picture String" that woke our curiosity, but we couldn't find out what it was or how to use it without the manual. (A picture string, by the way, is a character string used to describe the length and type of data stored in a field—such as nine digits for a social security number.)

FILE MANAGEMENT. Unisys uses a drawer, folder, and document paradigm for file management. A three-level filing system, Unisys reasons, is as much as the end user wants to deal with. That may be so, but it's limiting for corporations that need several directory levels. However, we were told that additional levels are planned for later versions.

The file drawer contains folder lists. The folder holds document information: document name, the type of document (e.g., spreadsheet, ASCII), title, author, date of creation, number of pages, and access level. The access levels at this point include read, write, create, delete, modify, copy, and move. Simple text search is also available from the folder, and drawers and folders can both be designed to include or exclude whatever information the user deems necessary.

When you delete a file, it goes into a wastebasket. Release 2.0 added a feature that automatically purges the wastebasket at user-specified intervals to avoid potential storage strains.

Each document has a corresponding summary page that renders additional document details: name, title, author, operator (the person who actually sits down and does the typing is not necessarily the author), notes, and statistics—things like date and time, work time, the date of last revision, etc. The summary page pops up automatically when you create a new document, but you can bypass it. If you purchase Ofis Retrieval, a full text-retrieval package, you can also search from the summary page.

Security. Ofis Manager maintains the Unix system security levels: private, group, and public. An average end user can set permissions by using the menus, which is good; some systems demand a working knowledge of Unix to set permissions.

MAIL. Unisys scrapped Quadratron's mail and developed its own for two reasons: to talk to products outside Unix and to adhere to standards. Mail is exchanged using various gateways: X.400 and OSI mail protocols (an X.500 implementation is also in the works), SNADS, and UUCP. It also supports underlining protocols: X.25, TCP/IP, DIA, and SNA. Documents sent to IBM environments are automatically converted to DCA RFT. Others are converted to the appropriate format (usually ASCII).

Unisys has four independent mail boxes: one for regular E-mail, one for appointments, one for procedures, and one for phone messages (including voice mail notification, if VIPS is connected to your system). We wondered why they weren't integrated. Apparently, they once were. But customers were getting frazzled trying to keep track of which messages were which, so the system was partitioned.

Ofis Manager mail is well implemented. You can easily add blind carbon copies, prioritize mail, and send attachments. The full Ofis Manager word processor is available from mail—a good move. The mail system can also be customized by your systems administrator to use other word processors—a better move. Lists of user names are available from directory services, and users can maintain up to 40 distribution lists. You can send to as many as 16 of them at a time, but you can't nest them.

The global directory is distributed across the network rather than centralized, which is good. Users have on-line access to directory information. Although a list of user names is available, a name server that supplies names for remote addressees is not. So, if you're sending something to a remote user—say, Siobhan O'Shaughessey—and you're not sure how to spell her name, you're up the creek.

Ofis Manager is sold modularly. Fine. But also offer a bundled system. Frankly, word processing and spreadsheets should be part of any office system, not extras that you have to pay for.

DATABASE. Simple databases for the phonebook, notepad, and forms are all that's provided. Unisys left heavy-duty database processing to the heavy-duty RDBMSs out there, like Oracle, Informix, and Unify. You can integrate the database application of choice via Ofis Access, an optional Ofis Manager product that allows access to outside applications. The external application can be added to the Ofis Manager menu. But when you access it, you're working within the native environment. No traces of Ofis Manager remain. You also have the option to query against PC and mainframe databases.

SCHEDULING MEETINGS. The logic behind Ofis Manager's scheduling component is weird. You cannot schedule a meeting between individuals unless you first assign them to a group. We hoped to at least check a list of groups and see if and where individuals are assigned. Wrong. Although preassigned groups exist, we couldn't find a list.

Other than this significant problem, the product is a traditional meeting scheduler that asks for the time and date (which defaults to the current date), start and end time and date, and duration of the meeting. It will also schedule resources and automatically reschedule appointments.

PERSONAL SERVICES. Personal Services consists of four components:

- Note pad. The note pad has a no-frills word processor for quick notes with key words from which you can search. The idea is to use it as a personal database. But notes cannot be incorporated into a document. We'd like to see that capability.

- Phone book. The phone book is a generic electronic rolodex—no autodialing, no merging data into a word processing document, and no integration with data in the phone messaging component.

- Calculator. What can we say? The calculator calculates numbers (rows, columns, random numbers). It won't, however, integrate those numbers into spreadsheets or documents.

- Phone messaging. Phone messages are keyed in on an electronic form that looks like one of those pink "While you were out" slips. Release 2.0 gives you access to a list of usernames, so you don't have to exit the phone messaging component entirely in the likely event that you don't remember a particular username (as you must in Release 1.1).

The Options

As mentioned, Unisys provides optional Ofis Manager products that are sold modularly. Question: Why aren't they bundled? Company representatives told us that some customers require individual components. Well, fine, sell them individually, if need be, but also offer a bundled system. All the components are necessary to the complete solution Unisys proselytizes. Frankly, word processing and spreadsheets should be part of any office system, not extras that you have to pay for. It's also difficult to keep track of what's included in the core product and what isn't. And more product confusion is something Unisys doesn't need.

The Ofis Manager optional modules include:

- Ofis One, the word processor.

- Ofis Plan, a spreadsheet package.

- Ofis Procedures, a procedural automation package.

- Ofis Deskset. Yes, this is the same Ofis Deskset PC we described earlier as a standalone product. However, since its main function is to provide Unix/DOS integration, it's also an Ofis Manager component.

- Ofis Retrieval, a full-text retrieval package.

- Ofis Chart, business graphics generated from spreadsheets.

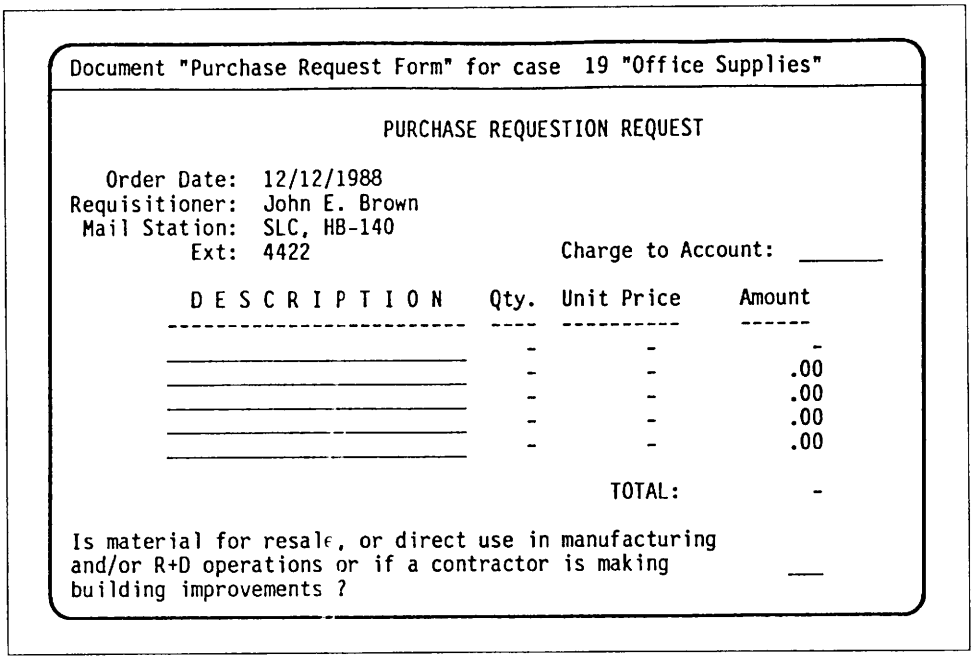
- Ofis Access, a mail gateway product that provides interconnect to outside environments (e.g., DISOSS, X.400, SNADS, PROFS).

OFIS ONE. Ofis One has most state-of-the-art features: WYSIWYG snaking columns and table formats (move, copy, and delete columns), index generation, footnotes (although you must manually leave room at the bottom of the page), macros, headers and footers, prototype documents, up to 10 bookmarks, spell checker, and thesaurus.

Unisys lets you invoke functions by command menus. But sometimes the menus can bog you down when the function you need is a few layers deep. Old pros can ignore menus altogether

and work in Expert mode. Unisys tweaked an annoying quirk in Q-Office, here. Ordinarily in Q-Office, once you choose Expert mode, you're stuck there, and you can't call up a menu item if you need to. But in Ofis Manager, you can call up a menu at any time. Again, we'd like to see Unisys implement menu items that indicate the corresponding commands.

Granted, we're not talking about any cutting-edge technology, here. Although the current Unisys word processor doesn't do anything special, expect some changes. A next-generation word processor with a compound document architecture is planned. (Unisys will, most likely, OEM one that's already out there.)



Document "Purchase Request Form" for case 19 "Office Supplies"

PURCHASE REQUESTION REQUEST

Order Date: 12/12/1988
Requisitioner: John E. Brown
Mail Station: SLC, HB-140
Ext: 4422 Charge to Account: _____

DESCRIPTION	Qty.	Unit Price	Amount
_____	-	-	-
_____	-	-	.00
_____	-	-	.00
_____	-	-	.00
_____	-	-	.00
		TOTAL:	-

Is material for resale, or direct use in manufacturing and/or R+D operations or if a contractor is making building improvements ? ___

Procedure documents can either be memos, letters, or forms. They represent the steps within a procedure. This one is a purchase requisition.

OFIS PLAN. The spreadsheet component falls short of what serious spreadsheet users now expect. However, Unisys isn't trying to compete with single-application spreadsheet products; it would rather coexist with them than reinvent the wheel. As with the database component, you can substitute Ofis Plan with a more powerful spreadsheet, which makes us wonder why Unisys even offers it, especially when it's not even part of the core product. We can understand offering a generic spreadsheet as part of the office system, but, if customers have to pay extra for it, why bother?

Ofis Plan is modeled more after Multiplan than Lotus or Excel. Although it's not ultra-functional, it performs most basic functions (statistical, mathematical, Boolean, financial, date, and what-ifs). It reaches to 32,767 columns and rows—probably as much space as you'll need. It also provides context-sensitive Help and multiple spreadsheet-linking for shared data.

OFIS PROCEDURES. A company like Unisys offering a procedural automation package is a good sign; an influential, traditional company zeroing in on a not-exactly-mainstream-but-worthwhile technology is always welcome. The full potential of procedural automation has yet to be realized, although its image as a mere clerical tool is changing, largely because of Hewlett-Packard's NewWave. The real potential of procedural automation lies in integration with other technologies. It could, for instance, perform complex queries in a database. And it's tailor-made for ripening technologies like groupware, decision-support systems, and executive information systems—technologies that need a traffic cop to coordinate the flow of activities.

Ofis Procedures is the Unisys version of Staffware by FCMC (see the *Office Computing Report*, Vol. 8, No. 6). Staffware approaches procedures differently than NewWave (for a review of NewWave, see the *Office Computing Report*, Vol. 10 No. 12). It doesn't use graphics or objects, but a business form paradigm (duplicating preprinted forms on screen). The program pops up when you hit a hot key from within Ofis Manager.

Using Ofis Procedures. Ofis Procedures, in its second release, is very powerful, even if it's not as elegant an environment as other offerings we've seen. Participants in a case (or procedure) have it pretty easy; Unisys has done a fine enhancement job, here. But the case definer (the person who creates the procedure) is stuck with a mediocre environment. Admittedly, only the definers have to work with it, and definers make up a small percent of Ofis Procedure users. Therefore, Unisys made a conscious decision to first tackle the general participant's view of the product along with overall procedure functionality.

The Participant's End. As we mentioned, being a participant is easy. The system notifies you when you have procedure mail. Procedure mailbox directories include the procedure name, a system-assigned case number, a case description, and the document name. Documents can either be memos, letters, or forms. They represent the steps within a procedure.

Sometimes, documents just provide information; sometimes they need action. We filled out a trip expense requisition, and it was no problem. Pop-up menus made navigation within the form simple. Form fields varied according to their function. For instance, required information, like trip destination and length of stay, appears in reverse video, so you know that you

can't consider the form finished unless all the reverse video fields are filled. Optional information is underlined, and calculation fields appear in bold. A really neat feature is pop-up database information. For instance, if you specify San Francisco as your destination, the system searches an internal database for hotels in the San Francisco area and lists them in a pop-up menu. When you choose a hotel, expenses are automatically put into the calculated fields.

The form we worked on was clean and straightforward, but your documents will only be as good as your definer. The definer can modify documents to meet your level of participation and hide certain fields and formulas. He or she can also provide up to three lines of Help specific to the step you're on.

The Definer's End. The definer has complete control of the procedure, from drawing out a flow chart to creating electronic documents to running tracking reports. Ofis Procedures offers definers a good bit of functionality: word processor document merge (you can also create them on the fly), dynamic routing updates (e.g., a purchase order goes to one place if the amount is less than $2,000 and to a supervisor for approval if it is more), access to user profiles, and concurrent actions (especially valuable for workgroup situations where several people need to see and act on information at the same time).

It's up to the definer to dictate each task of a procedure. FCMC speaks of procedure tasks as "Diractives" (Document for Information, Response, and ACTion). Diractives? Why FCMC complicated a simple idea by giving it an enigmatic name that looks as if it contains a typo, we'll never know.

Definers need special training to create procedures, and Unisys offers an intensive five-day course to get them going. What Ofis Procedure developers should keep in mind as they enhance the definer environment is that definers are end users, too. They're not techies; their expertise is in procedure creation. Not much about the program is obvious—coded formulas everywhere—and everything takes a lot of steps, leaving ample room for error. And you plod along without much prompting by the system. For instance, we tried to run a Management Report, a low-level database query, to calculate monthly traveling expenses. We called up the Management Report screen editor, and it's a mean one. You must manually leave room for fields (wouldn't picture strings be handy here?), and if you mess up, the fields overlap and your report contains bizarre things like backward question marks. Creating the fields was a chore in itself, and only minimal Help exists. It's hard to keep track of field names. A list of them is available, but they're not particularly recognizable. We advise field descriptions in addition to the names.

We also advise implementing better error messages. Currently, you bumble along, making mistakes that you don't know about until you think you're finished. In the situation we just described, we weren't aware of any mistakes until after the report was run and we saw those backward question marks. If the system won't automatically allot field length, it should at least warn you that you need more room.

Comments. Actually, our prognosis of Ofis Procedures is a good one. Once Unisys upscales the environment for the definer as it has for the participant, we expect a solid product. But, for now, we'll stop harping on the interface and mention functional issues. We like what Ofis Procedures has to offer, but it could use a few boosts. Flow chart generation is one. Another would be the ability to route tasks to departments. Sometimes tasks need immediate attention and can't wait until a particular participant comes out from under a heap of work.

Conclusion

The Unisys strategy is exciting, more so than its current products (its Unix products, anyway). Its perceptions of market directions hit the target. Interoperability, interconnectivity, standards, procedural automation (especially in conjunction with CSCW and Executive Support Systems), compound documents, voice annotation—they're all driving the industry. (So is object orientation, incidentally. Unisys says it's committed to object orientation. We'd like to see some products.) Thus, the overall product strategy is on track, but specific products haven't caught up.

Ofis Manager hasn't had enough remodeling to make it as competitive as it could be. We're not altogether sure Quadratron's Q-Office is the right foundation for Ofis Manager (considering the updating that has gone into Ofis Manager, perhaps Unisys feels the same way). Other Unix office systems, like Uniplex and Alis, offer at least as much functionality, but they're peppered with sophisticated features and interfaces (see Vol. 2, No. 12 and Vol. 3, No.3). Ofis Procedures, on the other hand, is halfway there. We've seen the cosmetic enhancements Unisys has already given it, and we assume that the finished product will look as good.

The Unisys strategy is exciting, more so than its current products (its Unix products, anyway). The overall product strategy is on track, but specific products haven't caught up.

Just don't expect anything overnight. Unisys has given itself a 1991 deadline to complete its consolidation, and the company is still not close to the open systems environment it envisions. We anticipate that, by the time its strategy falls in line, a new generation of products will begin to emerge.

INTRODUCING

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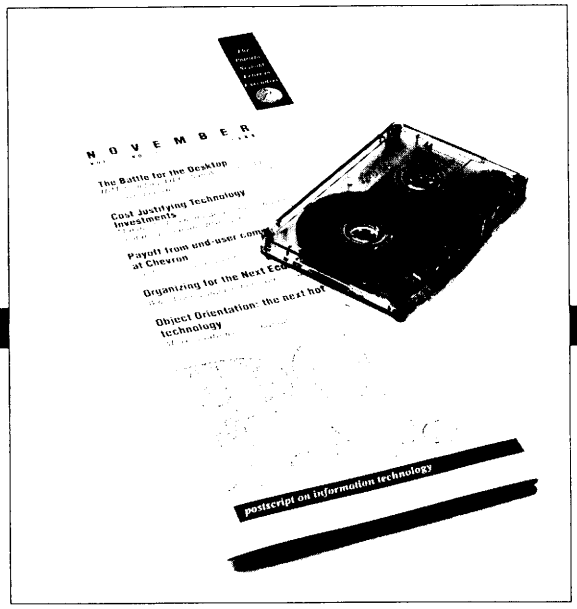

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•TUTORIAL•

Customizing Your Interface

By Gary J. Nutt

In June, we discussed how the Unix shell operates (see Vol. 3, No. 6). In review: The shell is just an application program that the operating system runs whenever a user logs into the system. Thus, one can arrange to run any particular version of the shell whenever one logs in by having the Unix system administrator edit the /etc/passwd file so that it specifies the particular version to be used. (As described in March, 1987, the /etc/passwd file contains one entry per user; the entry specifies the login name, password, user's real name, name of the user's home directory, name of the shell program that the user has designated, and command search path.)

In System V Unix, the default shell is the Bourne shell, and in BSD Unix, it is the C shell. More recently, the korn shell is being used by some users, although the Bourne and C shells are much more widely used (and are typically available on either version of Unix).

The examples in our discussion apply to the Bourne shell, although all of the features are also provided with the C shell.

When the shell is started by the operating system (that is, when the user logging into the system has been identified), the first level of customization begins. The shell executes a user-specific file containing arbitrary shell commands called ".profile" (in the C shell, the file is called ".login"). To customize the environment, the user edits the .profile file. Notice that the file is prefixed with a period; thus, it is "invisible" on the default directory listing command (ls). The .profile file is assumed to be located in the user's login directory, i.e., the one named in the /etc/passwd entry for the user.

Each command executed by Unix has a small set of environment variables to define certain values having to do with the name or the shell in use, the terminal type, etc. (You can discover the exact names and purposes of these variables by reading the manual page entitled "environ(5)" in chapter 5 of the Reference Manual.) You can use the "env" command to determine the current values of the environment variables.

The built-in variables can have their values changed by a shell command using a C-style assignment statement. For example, to set the value of the TERM environment variable, one could type the shell command:

```
TERM=vt100
```

If this command were placed in the .profile file, the TERM environment variable would be set to have value "vt100" each time the shell were started, i.e., each time the user logged in.

However, the new value of TERM would only be in effect for the current session (and only by the shell, not by programs that the shell might execute). If you want programs that the shell starts to use the new values, then it is necessary to export the new value to the running shell's environment. This is done using the shell commands:

```
set -a
export TERM
```

The effect of the three commands would be to set the value of the TERM environment variable to "vt100" for the remainder of the login session, and, if the shell ran a program that read the value of TERM (e.g., a text editor program), it would see the new value. Without the export command, the "child" program would use the original value.

Thus, environment variables are a mechanism for customizing your environment by setting the values at the beginning of the session—and the .profile file is the place to define these permanent custom changes.

The fundamental environment variable used by the shell is HOME. It specifies the home directory to be used by various programs (including the cd—change directory—command). The value of HOME is set by Unix to the value specified in the /etc/passwd file when it started the shell. It is useful to redefine HOME if you would like to work in a different directory than your login directory, e.g., a subdirectory containing a particular set of files and (sub)directories.

The PATH variable is very important. The Unix shell executes files by looking at the file name, finding the file in the file system, then loading and executing it. There are essentially no built-

in commands; instead, the "commands" entered by the user are treated as file names by the shell. Now a problem arises: Command names are entered on the command line as a simple string such as "ls" or "grep," but the files to be executed are located in a directory called /bin, /usr/bin, or elsewhere. Technically, the user should have typed "/bin/ls" if the intent were to execute the command stored in the file named /bin/ls. The PATH variable allows one to specify a number of directories that contain command files. The default value of PATH (defined in the environment as determined by the user's /etc/passwd entry) includes the strings /bin and /usr/bin because these two directories ordinarily contain most commands.

Unix installations usually have local programs that have been added to the shell command repertoire and are intended to be executed just like the one located in /bin and /usr/bin. Rather than load them into one of these two standard directories, the system administrator may store them in a new directory, say /usr/local; to use one of these commands, the string /usr/local must be added to the definition of the PATH variable. The standard value for PATH is defined by a shell command like:

```
PATH=:/bin:/usr/bin
```

If we added a command to the .profile such as:

```
PATH=:/bin:/usr/local:/usr/bin
```

we could execute commands during our login session from three directories—/bin, /usr/bin, and /usr/local. Suppose that there was a file, "blah", in /usr/local that also appeared in /usr/bin; then, whenever the user typed "blah" on the command line, the corresponding file in /usr/local would be executed instead of the one in /usr/bin, since the former directory appears first in the list of names assigned to PATH. Thus, it is easy to make your own version of any Unix command and override the standard command, or to add to the command set by adding programs to a directory and adding the directory name to the PATH search list.

Consider the TERM variable used in the example above. Many Unix application programs depend on specific characteristics of the terminal employed by the user for the current session. For example, hard-copy terminals (remember them!) cannot support the idea of a cursor, but a VT100-compatible terminal includes specific commands at its computer/terminal interface to allow a program to move the cursor. The application programmer likes to write the program so that it ignores terminal characteristics as much as possible, but so that it can take advantage of particular terminal characteristics in particular cases. The TERM environment variable can be read by a program, and it can be set by a shell command. Almost every .profile version includes a command line to set TERM, and users who work at a variety of terminals at different times (office, conference room, home, and hotel room) need to change the TERM variable at each login session. It is easy to program the shell (using the .profile file) so that it queries the user at login time about the terminal currently being used. Consider the following commands:

```
echo -n "Enter terminal type (default 4425):"
read ttype
if test $ttype = 'v'
then TERM=VT100
elif test $ttype = 'm'
then TERM=macintosh
else TERM=4425
fi
echo "TERM=$TERM"
set -a
export TERM
```

When the first echo command is encountered,

```
Enter terminal type (default 4425):
```

is printed on the console. The shell will wait for the user to type a message whose value will be stored in the shell variable named "ttype." If the user types a "v", then TERM will be set to be "VT100"; if the user types "m", then TERM will be set to be "macintosh", and if the user types any other character(s), TERM will set to the value "4425". The second echo command will print the value of the TERM variable for the session.

The PSI environment variable specifies the string to be printed by the shell to prompt the user. Without explanation, this seems like a trite environment variable. However, imagine that you are working in a multimachine environment where you perform some work on one Unix machine and then log into another Unix machine for other work. In a network environment, where this is a common situation, it is very easy to forget which machine you are connected to at any given moment (particularly if you are interrupted by a telephone call or other distraction). Suppose that you commonly log into Unix machines named hazel and filbert; then you can edit your .profile on the respective machines so that there is a line such as

```
PS1 ="hazel$"
```

and

```
PS1 ="filbert$"
```

on the two respective machines. The command line prompt will constantly remind you of the name of the machine that you are currently using.

There are other standard environment variables to specify the identity of files associated with the electronic mail system (see MAIL, MAILPATH, and MAILCHECK in your Unix Bourne shell documentation). It is also possible for you to define your own variables, such as "ttype," if you so choose.

Of course, you can include ordinary shell commands as lines in the .profile. For example, many users like to include the date command as the last command in .profile—just a friendly bit of customization to provide you with the current date and time when you start your session.

The shell also uses a number of characters to erase typing mistakes, to delete a command line after it has been typed but not terminated with a return character, etc. For example, the default erase character is mapped to the Delete key on many terminals; I prefer that it be mapped to the Backspace key, so I include the following line in my .profile

```
stty erase "^h"
```

which causes the shell to backspace and erase a character whenever I type the equivalent to Control-h (i.e., the backspace character).

For each file that is created during your login session, the protection bits of the file need to be specified. For example, you may wish every new file to be readable, writeable, and executable by yourself, but only readable to other users in your group and inaccessible to all other users. In "shelltalk," the "umask" command specifies the protection parameter settings for files created during your session by setting values of the "000" parameter. Without going into detail, we could specify the protection properties for our example with the parameter "037". That is, the shell will interpret a line in the profile such as

```
umask 037
```

to mean that all files should be created with the protection flags specified above.

Let's take a look at a Bourne shell .profile that uses all of the features described above:

```
PS I ="hazel$"
PATH=:/bin:/usr/local:/usr/bin
stty erase "^h"
echo -n "Enter terminal type (default 4425):"
read ttype
if test $ttype = 'v'
then TERM=VT100
elif test $ttype = 'm'
then TERM=macintosh
else TERM=4425
fi
echo "TERM=$TERM"
set -a
export TERM
umask 037
date
```

Finally, the .profile can be used to extend or change the set of commands that the shell will execute. The particular commands used in .profile depend upon the type of the underlying version of Unix—System V or BSD. For example, you can "rename" commands by manually linking empty files in your own bin directory—say /usr/me/bin—to the commands in /bin and /usr/bin. You would probably also want to change the definition of the PATH variable as described above. Thus, you can rename ls to be dir (with ls parameter-passing conventions). The C shell has a very nice feature, the "alias" option, to support renaming so that parameters are also taken into account.

Unix shells are intended to be the command line interpreter interface to the facilities of the kernel and library routines. It is extensible so that you can "program" the shell to fit your own needs by editing your .profile file. This approach has proven to be very flexible and powerful over the years; it can also become very complex if you have a propensity to hack!

Office users that are supported by Unix can be shielded from many of the nasty parts of the Unix interface by a thoughtful .profile file. In general, a system administrator should provide a reasonably comprehensive generic .profile for the user. Each user can then perform minor alterations to the .profile to fit his specific needs.

We have taken a quick look at customizing the command environment. Next time, we can consider how to use the power of the shell to combine commands into larger commands.

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New Versions of Accell and Unify

Unify Corporation, based in Sacramento, California, recently introduced Accell/SQL for Unify 2000, an enhanced version of both the Accell applications development environment and the Unify relational database management system (RDBMS). Unify focuses primarily on Unix-based application development software tools and the commercial Unix market. While Unify Version 4.0 (the predecessor to Unify 2000) is available on DOS, the company has not yet ported Accell to the DOS environment.

The $1 billion plus U.S. Air Force contract (AFCAC 251) awarded to AT&T last October includes Accell/SQL for Unify 2000 as part of the package bid by AT&T.

ACCELL/SQL. Accell/SQL is an application development system with both an applications generator and a fourth-generation language (4GL). It also includes Unify 2000, the new version of Unify that now features ANSI-standard SQL, as the underlying DBMS. A cooperative processing option (Accell/CP) offloads user input and output processing from a Unix host to DOS-based PCs, improving performance or allowing more users to access the database while maintaining the level of performance. No programming is necessary to take advantage of the cooperative processing feature.

New Features. Enhancements to the applications generator in Accell/SQL include the ability to modify every aspect of the screen on a form (Accell treats each component as an object); the ability to create master forms that can be used as templates for other forms, and access to the operating system, editing system files, and 4GL scripts from within the generator.

The 4GL has been expanded to support both global and local functions, making applications more compact and easier to modify. Global functions can be used anywhere in an application; local functions are used only on one form. Function keys are now customizable; up to 99 function keys can be defined, and the prompts can appear anywhere on a screen form.

To improve runtime performance, Accell/SQL caches both forms and 4GL code in shared memory. Accell/SQL also has a compatibility mode which allows existing Accell applications to run with only minor modifications. (Accell/SQL's predecessor is Accell IDS, which includes Unify Version 4.0.)

Presentation Services. Unify is also taking steps to make Accell independent of the Presentation Manager on a platform. In addition to Accell's own windowing manager, there is now a version of Accell/SQL that runs under Microsoft Windows. For a PC user using the Microsoft Windows interface, Accell will automatically transform a Unify application, giving it the "look and feel" of a Windows application. For example, the user is able to size windows (scaling the font appropriately) and use a mouse, and he or she sees buttons instead of function keys. Accell essentially translates the Accell character model of the interface into the generic presentation model of Windows; the developer does not have to change the application.

In the future, Unify plans to introduce an Open Look interface for the Sun Microsystems and AT&T platforms. The company is also evaluating a Presentation Manager interface.

Availability. Accell/SQL for Unify 2000 will be available this month for AT&T, Sequent, and Pyramid computer systems. Other Unix platforms will be added throughout this year.

Prices range from $2,995 to $120,000, depending on hardware configuration.

UNIFY 2000. Unify 2000 now offers full ANSI-standard SQL compatibility plus performance and reliability enhancements designed to support large OLTP applications. The company has traditionally targeted the Unify RDBMS for transaction-oriented applications. For example, Unify has always supported several different data access methods to ensure high performance (hash indexes, links, B-tree indexes, and buffered sequential access). Unify 2000 adds a fifth data access method with direct access. The product also offers over 100 tuning options to maximize performance in a particular environment.

The new version enhances Unify's ability to deal with mission-critical online applications where 100 percent availability is a must. Added are online backup, automatic recovery, and ANSI-compliant security features at five levels (database, program, schema, table, and view). Unify 2000 also includes a dynamic data definition language (DDL). This means that the structure of the database can be modified without removing user access to the application.

Support for null values has been implemented in Unify 2000, and many of the database parameters have been extended significantly. Several are now virtually unlimited; the following all have maximums of 2.3 billion: tables per database, fields per table, characters in a binary field type, rows per table, indexes per table, characters per index key, and characters per row. The size of a database has been increased from 16GB over 8 disk volumes to a size constrained only by hardware limitations.

Unify 2000 is only available as part of Accell/SQL.

THE FRONT END OF CHOICE. Unify Corporation is moving forward with its long-term strategy of making Accell/SQL an independent applications development environment that can be used with a variety of RDBMSs and a variety of interfaces. The company's strategic objective is to make Accell/SQL the industry standard 4GL for commercial Unix applications. The company has started to integrate Accell/SQL as a front-end applications development environment with non-Unify DBMSs. The first step was an alliance with Santa Cruz Operations (SCO), under which Unify is modifying Accell/SQL to work with SCO's Integra DBMS as the back end.

Last October, Unify announced a joint marketing agreement with Sybase, Inc. under which Unify will interface Accell/SQL to the Sybase SQL Server. This is a response to the need to better support the workstation environment, in particular Sun workstations. The Sybase RDBMS becomes another back-end option for the Accell developer. Accell/SQL for Integra will be available in February, and Accell/SQL for Sybase in April. The first implementation of Accell/SQL for Sybase will be on the Sun Microsystems workstation. No pricing has been established yet for these products. —*J. Davis*

•HEWLETT-PACKARD•

Suiting Up for the Office

Hewlett-Packard (HP) has made a number of recent moves to better position the HP9000 Series as a corporate player. The company recently has solidified its PC integration products by introducing a 286-based software emulator and enhancing the capabilities of its DOS coprocessor. HP also announced the 9000 Model 340, a competitively priced 68030-based system. Combined, these strategies make commercial penetration by the HP9000 Series more feasible.

PC INTEGRATION. Success for Unix in business environments demands a healthy DOS/Unix relationship. So Hewlett-Packard, among other vendors, is whipping its PC integration solution into shape. A DOS software emulator and a better DOS coprocessor are both part of that solution.

SoftPC is a software emulator designed by Insignia Solutions (Sunnyvale, California) that resides on Unix platforms and emulates a 286-based PC. It's been ported to the HP9000 Series (actually, HP has the rights to license and sell SoftPC as an HP product). Thus, HP can migrate DOS applications—in addition to HP proprietary applications—to the entire range of 9000 Series 300 and 800 systems, including the RISC-based HP Precision Architecture Model 855. SoftPC ranges in price, depending on system configurations, from $700 to $2,750.

HP also upscaled the capabilities of its Series 300 coprocessor with EGA display emulation and support for MS-DOS and X-Window. Series 300 models can now operate as an X client for remote and local use of DOS software in the X environment. The DOS coprocessor includes both hardware and software and is priced at $1,335.

HP9000 MODEL 340. With the introduction of the Model 340, HP has one of the lowest-priced Unix 68030 systems going and has created a potential entry to corporate environments. The 4 MIPS diskless workstation with 4 megabytes of RAM sells for $5,495. It has a 17-inch monochrome monitor and a graphics board with 1,024-by-768 resolution. The system includes:

- MC68882 floating-point processor
- An RS-232 serial port
- A parallel port with direct memory access
- HP's Unix operating system (HP/UX)
- Sun's NFS
- Full implementation of X-Window Version 11
- C language compiler
- HP's Starbase Graphics Library

The Model 340 also comes in a few alternate (and more expensive) varieties. The 340MH has a 19-inch

monochrome display and offers 1,280-by-1,024 resolution. It also does 2-D graphics. There are also three color versions: the 340C+, which supplies six bits of color on a 16-inch color monitor and includes HP's 2-D graphics package; the 340CH, which supplies eight bits of color on a 16-inch monitor and includes the graphics packages as well as two overlay planes; and the 340CHX, which has a graphics accelerator card that doubles the graphics performance of the 340CH. The Model 340MH is priced at $7,995, the Model 340+ at $8,495, the Model 340CH at $10,995, and the Model CHX at $15,995. All Model 340 products will be available in March. ◐ —*L. Brown*

•SOLBOURNE•

SPARC-Compliant Superworkstations

These days, start-up companies based on *the* new hot technology are a dime a dozen, and failed start-ups are even cheaper. Yet, every once in a while, a new company catches your eye, a company that seems to have put together a good technological idea with a sound strategic plan and is logically setting about to implement both.

One such company, Solbourne Computer (Longmont, Colorado), has just announced products and a strategy that could, within a couple of years, vault it into the role of major player in the Unix superworkstation market. The new products—Scalable Processor Architecture (SPARC)-based, Sun-4-compatible Superworkstations—feature multiprocessing and aggressive pricing, and are intended to establish the company's legitimacy in the market. Using these Sun work-alikes as a jumpstart, Solbourne intends to deliver two ultra large scale integration (ULSI)-based SPARC workstations, a multiprocessing workstation delivering over 90 MIPS, and a 25 MIPS workstation for under $10,000 by 1990.

WHO IS SOLBOURNE? Solbourne was formed in 1986 through an alliance between Douglas MacGregor, a principal designer of the Motorola MC 68020 microprocessor and the giant Japanese electronics company Mitsushita (better known in the United States as Panasonic, Technics, Quasar, etc.). Under the agreement, Mitsushita (which owns 52 percent of Solbourne) provides the chip design and manufacturing expertise as well as financial resources, while Solbourne contributes the system design and marketing and distribution functions as well as the "American entrepreneurial spirit." The Mitsushita relationship also provides Solbourne access to the Japanese domestic market.

Initially, the Solbourne workstations are being built at a Mitsushita facility in Japan. The manufacturing function will be moved to Colorado sometime this year.

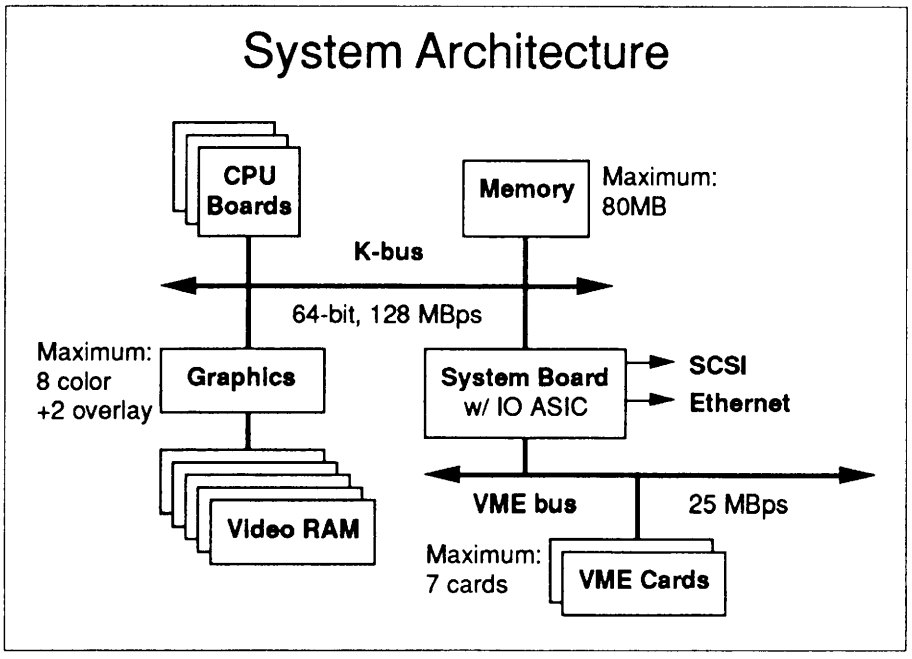
A SOLAR ENERGY JUMPSTART. Solbourne plans to release its products over three phases—the Series4, the Series5, and the Series6—which will move Solbourne from current SPARC processors to its ULSI chip, which is being co-developed with Mitsushita.

With the Series4, available immediately, Solbourne plans to ride the popularity of the Sun-4 workstations. The Series4 is completely compatible with the Sun-4 SPARC chips and will execute applications programs written for the Sun-4 without porting or recompilation. This level of compatibility has been reached by licensing the necessary elements from Sun:

- The SPARC computer architecture
- SunOS, Sun's version of Unix, which Solbourne has modified to support muliprocessing (see below)
- SunView, NeWS, and, when available, NeWS/X11 for windowing
- Network File System (NFS) and Open Network Computing (ONC) for networking and remote program execution

In addition, the Series4 models emulate the Sun-4 standard frame buffer to provide graphics compatibility, with Sun's Pixrects graphics library providing the necessary graphics software interface.

Solbourne Series4 and Sun-4 workstations and servers can be transparently mixed and matched in the same network.



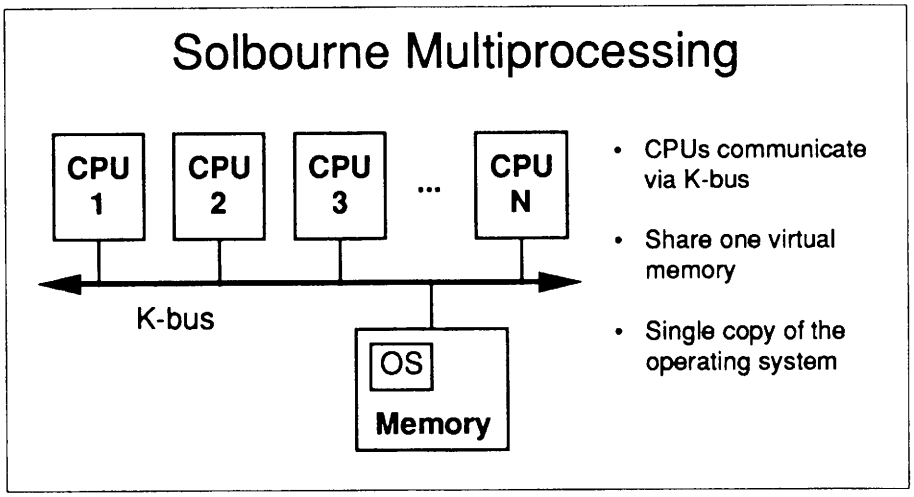
First Multiprocessing SPARC Implementation. The initial thrust of Phase 1 is to compete with Sun and other workstation vendors on the basis of equal performance at a 10 percent to 20 percent cost savings. However, this is only the beginning. With the Series4, Solbourne has introduced two enhancements over current offerings: multiprocessing and a 64-bit data path.

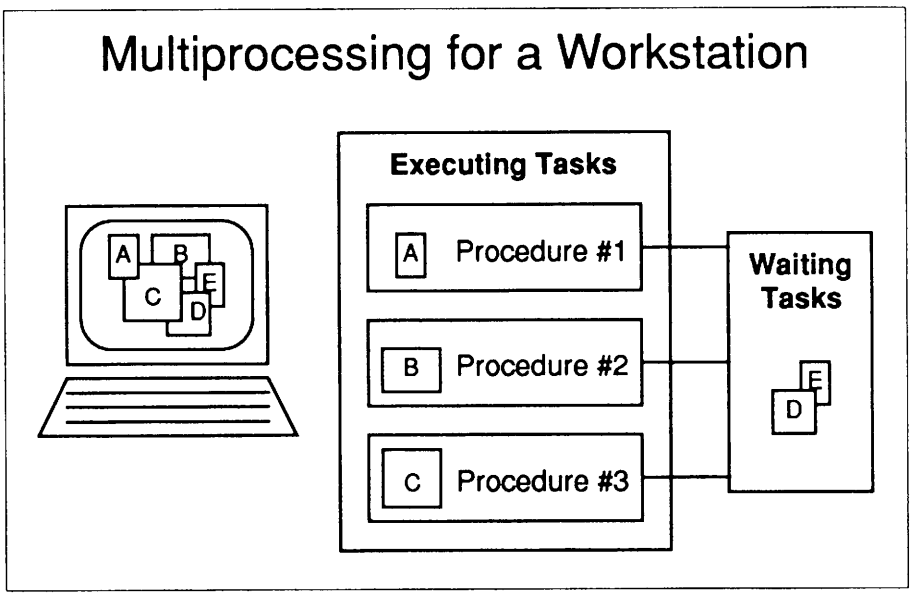
In order to do both, Solbourne has designed its own internal bus, known as the K bus (not to be confused with the standard VME expansion bus, which is included in the Solbourne systems). This 128 Mbps, 64-bit bus allows a number of processors (initially up to four) to share virtual memory and a single copy of the operating system. The operating system itself, while remaining SunOS-compliant, has been enhanced to handle the multiple processor architecture.

On the workstation, multiprocessing permits simultaneous execution of discrete processes, while decreasing the queueing time for waiting tasks. The Solbourne OS features dynamic load-balancing to optimize the distribution of tasks. This should greatly increase the workstation's ability to run multiple applications that do not have to vie for time on a single processor. In addition, an individual application that creates a discrete process (for example, graphics or communications) can have these processes run simultaneously on separate processors. This is all transparent to the application (no special programming is necessary) and to the user.

On the network server side, the Solbourne workstations can be configured as compute servers, with each processor simultaneously handling individual client requests.

Phase 1: the Series4. The initial announcement details the availability of the Phase 1 machines: the Series4/600 Superworkstation and the Series4/800 File/Compute Server. Each can contain from one to four processors. The processors use the Fujitsu SF9010IU SPARC 32-bit RISC CPU and Weitek floating point chips, and each contains its own cache memory; all processors share a single main memory and operating system. Systems with fewer than four processors can have the additional processors installed at the customer site.



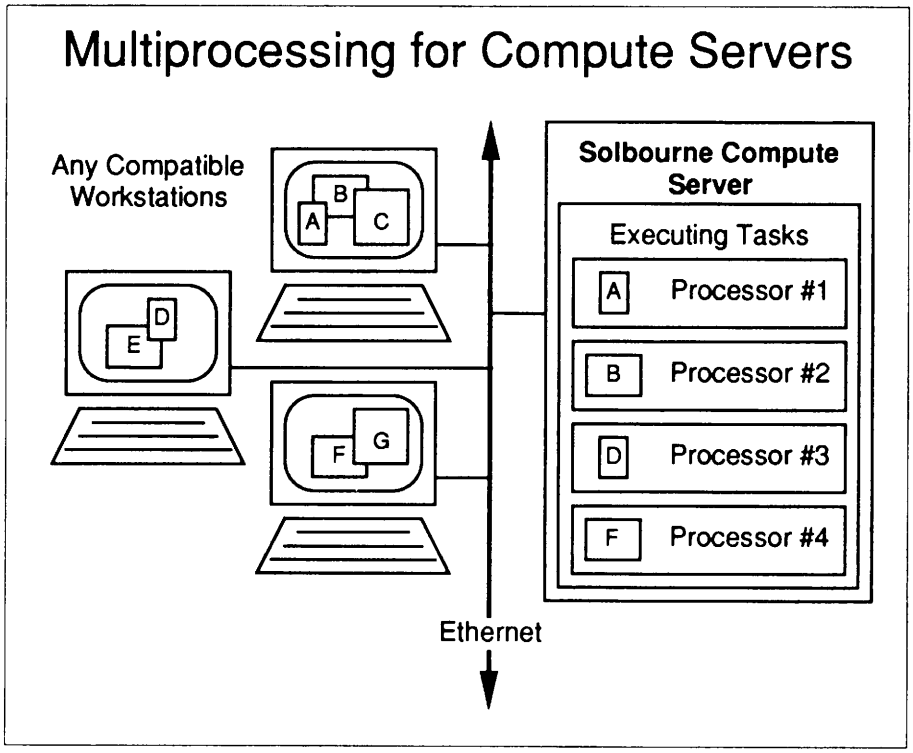


Eight Series4 models are offered:

Model	#CPUs	MIPS	MFLOPS
601/801	1	9.5	1.6
602/802	2	17.0	2.9
603/803	3	24.0	3.6
604/804	4	30.0	4.7

Pricing ranges from $45,400 for a diskless, single-processor Series4/601 with 16MB of RAM to $130,400 for a Series4/804 with 32 MB and 4 disk drives totaling over 3GB of storage. All models include a one-year warranty.

Solbourne's comparisons show a distinct price/performance advantage for its workstations over Sun-4s: the Series4/601 (9.5 MIPS) at $45,400 compares with a similarly equipped Sun-4/260 (10 MIPS) at a list of $59,400 for a 24 percent price advantage (if one includes Solbourne's one-year warranty vs. Sun's 90-day warranty plus the cost of a 9-month service plan, the savings increase to 28 percent). Solbourne's figures show that its price per MIPS advantage (a somewhat dubious measurement) increases as more processors are added: the Sun-4/260 costs $6,260 per MIPS (with maintenance) vs. $3,023 per MIPS for the dual-processesor Series/4602, an over 2 to 1 price/performance advantage. Add-



ing processors can bring the Solbourne cost to under $2,500 per MIPS.

Phase 2: The Series5. Later this year, Solbourne will bring out its Series5 models. These will be essentially the same as the Series4, except that they will feature a newer, high-performance processor based on the Cypress SPARC chip. Performance will be between that of the Series4 and the Series6, with the goal of doubling Series4 speeds. The Series5 models will be field-upgradeable from the Series4 via a board swap. Pricing has not yet been announced.

Phases 1 and 2: Building the Infrastructure. Solbourne believes that, ultimately, its Series6 products based on the USLI processor that is being developed will be the key factor in its rise to prominence. While the company hopes to do well with the Series4 and the Series5, its long-term strategy calls for using these products to create the infrastructure necessary to make it a long-term major player upon introduction of the Series6.

The development of this infrastructure will come in three areas: manufacturing, sales, and service and support.

As noted above, a Mitsushita manufacturing plant will be opened in Colorado this year. Phases 1 and 2 will involve the movement of manufacturing operations from Japan to the United States and the shake-out period that this will require.

The company is also actively deploying a direct sales force, with offices already opened in San Jose, Chicago, Boston, Denver, Syracuse, Minneapolis, Dallas, Washington, D.C. and Los Angeles. All of these were opened and staffed before the product announcement. In fact, early customer shipments began in December under confidentiality agreements. The company is also recruiting distributors, VARs, and OEMs, with announcements of these due very early this year.

One of Solbourne's earliest commitments was to have a service and support organization in place at product introduction. This organization was formed last October, with 11 support personnel at corporate headquarters and continuing active recruitment of system engineers and field engineers.

The products themselves come with Solbourne's Parasol service plan, a one-year extended warranty which includes parts, labor, installation, training, and access to SOURCE (Solbourne Users Response Center).

The important point for Solbourne is to have all three organizations—manufacturing, sales, and service—in place during Phases 1 and 2, so that the company can "hit the ground running" with what it feels will be its breakthrough technology.

Phase 3: The Series6. For Solbourne, it is with the Series6 and its USLI-base SPARC processor that the company will make its mark. Due early in 1990, the processor will, on a single chip containing about one million transistors, integrate the functions that currently are carried out by many chips. These functions will include:

- Integer CPU
- Floating point
- Memory Management Unit (MMU)
- Cache memory

An additional chip will have a set of 128KB caches and a multiprocessing (MP) bus watcher.

The USLI processor will deliver 25 MIPS. Solbourne is aware that, upon introduction, this will not be the fastest chip. Rather, it is banking on delivering the best price/performance due to the multiple functions handled in the single chip.

The USLI processor will allow Solbourne to go in two directions, staking a claim in both the high-end superworkstation and low-end desktop markets. At the high end, the 25 MIPS will allow its K-bus multiprocessing architecture to reach speeds approaching 90 MIPS. Customers will be able to upgrade from the Series4 and the Series5 to the high-end, multiprocessing, Series6 models.

However, it is on the low end that Solbourne feels that it can really make its mark. While pricing is not announced, the company's stated goal is to deliver a 25 MIPS workstation to the desktop for under $10,000. This workstation will be quite distinct from the

rest of the Solbourne family. It will not feature multiprocessing. In fact, it will not have the internal K bus. Rather, it will have an onboard data path. It will rely on the speed of the single processor. It will, however, retain the Sun compatibility of the rest of the product line.

DOING IT RIGHT. Solbourne seems to be making all the right moves. The company is using Sun's success to its own advantage (does Solbourne translate as burning Sun?) while producing exciting technologies of its own. Multiprocessing, the 64-bit data path, and the USLI chip are all appealing in themselves. Yet the Solbourne story may be much more than that. Jump-starting on standards, pre-building the infrastructure, and a multifaceted strategic relationship with a major overseas company may, in fact, become a model for start-ups in the '90s. ◐ *—D. Marshak*

UNIX KERNELS

By Judith S. Hurwitz

Choice morsels from the center of the Unix world...

WAS IT JUST LIP SERVICE? Remember last year at UniForum when John Scully gave the keynote and swore allegiance to Unix? Well, that may have been the high point in Apple's devotion to Unix. We definitely get the feeling that Apple is having second thoughts. The reservations seem to be caused by two factors: First, Apple has had problems making its brand of Unix operational with its own user interface on top. Second, Apple seems to have some reservations about how important a standard operating system is. It is no secret that Apple is working on a next-generation proprietary operating system that might actually support true multitasking. So, who needs Unix, right? Anyway, current thinking in Apple seems to be "We're selling so many Macs without Unix, why bother?" If all those software developers continue to write for the Mac first, maybe they're right. Then again...

A TRUE BELIEVER. Yes, we know now that Digital has converted to become a true lover of Unix and standards. As expected, Digital will begin to put the MIPS chip technology to work in a new generation of RISC workstations. We've heard that Digital was somewhat concerned that it had to rely on only one source for its RISC chip. Therefore, the story goes, it approached Motorola about second-sourcing the MIPS processor. After some consideration, Motorola decided that it would be better off sticking with its own homegrown variety: the 88000. Oh, well...

We have another pet theory about Digital (based on conjecture only; no deep sources here). Digital has publicly stated that it plans to make VMS Posix-compliant (work is already in progress). Wouldn't it be interesting if, over time, Digital actually made VMS so compatible with Unix that it could run Unix applications without change? Then Digital sales folks could approach customers with a sales pitch that might go something like this: "If you want Unix, we've got Ultrix. But if you want a real commercial operating system that adheres to all standards, why not try VMS? This is the real stuff, with all the networking and commercial quality from Digital." It's food for thought anyway.

PROUD PAPA. DG is pretty darned proud of its new Unix operating system (featured in the November issue). In fact, the company is so pleased that it intends to license the system to third parties. Stay tuned for more details...

KEEPING THE PEACE. The X/Open guys could be the white knights of the Unix marketplace. Unlike our friends at OSF and Unix International, these people aren't itching to get in the middle of the fight. We expect that X/Open will look for a way to be more proactive and may even serve as a peacemaker. This role could be easier than one might suspect. We think that both OSF and Unix International would like a third party to help them avoid potential shooting matches. They fear—and rightly—that if they spend lots of money publicizing the differences between the two organizations, users may walk away from both of them. We'd like to see X/Open act as a sheriff. ◐

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