Patricia Seybold's

INSIDE

EDITORIAL

The Tip of the Iceberg
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Few users understand the true power of new object-oriented environments. Lured by easy-to-use icon-based graphical interfaces, users will start to discover the powerful capabilities of object-oriented systems and distributed computing that lie beneath.

NEWS ANALYSIS

NCR has planned its Open Cooperative Computing Architecture strategy well; now we wait for products to fulfill that strategic promise • We look at **Uniplex's** gains from its OpenMail deal with **Hewlett-Packard** • UniDesk, a Unix desktop manager from **UniWare**, illustrates a European approach to security • **Apple's A/UX** Release 2.0 exploits the power of Unix and the ease of the Macintosh...about time **.......Page 18**

UNIX IN THE OFFICE

PRODUCTS • TRENDS • ISSUES • ANALYSIS

Hewlett-Packard's NewWave Office

Distributed Object Management in an Open Environment

By Judith R. Davis

WHAT COMES TO MIND when you think of Hewlett-Packard? Minicomputers and software for manufacturing environments? The acquisition of Apollo last year, which vaulted HP to the top of the technical workstation market? The "Spectrum" RISC architecture? The HP9000 Unix platforms? The ubiquitous LaserJet

SOMETIMES CLICHES just say it all. It's hard to see the forest for the trees. Can't get too much of a good thing. And, of course, let's look at the big picture. Now, aren't those the greatest things since sliced bread? What does all this have to do with Unix and software? We are beginning to see the way vendors will develop systems in the next decade—at least the tip of the iceberg. Vendors will be adopting client server models with graphical user interfaces. Companies no longer are developing systems; they are inventing environments.

• E D I T O R I A L •

The Tip of the Iceberg

And Other Worthwhile Cliches

By Judith S. Hurwitz

write code.

The big picture is even more interesting. In the end, this is not a technology story at all. It is a story about how technology will evolve to let users unlock the information they have stored in their systems for decades. Ever since the term Management Information System came into common use, management has understood how valuable it would be to compare data across product lines and customer bases. To be able to look at a customer in one segment of a business and see what products in another seg-

HP's NewWave environment with its DOS client connected to multiple servers (see this month's feature report) is an example of the way systems will act in the future.

Yet the depth and breadth of what is coming is not necessarily clear to users. The full benefits of an environment like NewWave aren't apparent. Underneath the iconic user interface of NewWave are powerful enablers that allow users to create relationships between objects—modular pieces of information that can automatically link to the program that created them—on the fly. The NewWave Agent facility allows users to encapsulate a series of routine steps in an automated procedure. But the power isn't obvious. Users have to look beneath the surface at what this technology can do for them.That is why people still consider NewWave just a user interface.

Yes, this stuff will be good. Once users begin to understand what object orientation is all about, they will see that it's the only way to work. Being able to reuse modular pieces of software code will do wonderful things for overburdened MIS organizations. Object-based systems will allow users to create large complex views of information by simply taking slices of information as displayed by various application packages and viewing them as a single picture. With object-oriented links, users can see the relationships among data without having to

ment of the business would be a good match is precisely what management needs. But the obstacles to achieving this became apparent very quickly. The systems that had been developed to track these different products and different customers were incompatible, and building the bridges between systems was too much for most MIS budgets.

Likewise, the other promise of the last 10 years was the idea of the automated office. The premise was that a user could be in touch with everyone in the organization and keep a finger on the pulse of the organization (mostly through tools such as electronic mail, word processing, and spreadsheets). The trouble was that automated office systems were large, centralized, and inefficient, and almost every individual in an organization who needed to communicate required expensive equipment with low perceived payback.

The technology being developed today in the laboratories of the major computer hardware and software vendors is intended to solve the same problems we have been grappling with for decades. It now looks as though we may have some answers. But users must take their time and look beneath the seemingly small pieces of ice floating on the surface. The technology being formed below will provide some interesting answers. ◐

•HEWLETT-PACKARD•

(continued from page 1) printer? Excellent service and support?

You may have come up with any or all of the above. But would "an innovative, open, multiplatform, object-oriented office system" have occurred to you? Probably not, unless, of course, you've been following HP's progress with its NewWave environment for DOS.

Well, take notice. HP is building a dynamite office contender with its NewWave Office. HP is certainly not the only major computer vendor to commit to Unix as a primary office server platform, but it is the first to actually introduce a real product with a real delivery date (next month). And the NewWave environment on workstations is seductive enough to win you over with a simple live demo. HP is also doing some interesting things with third-party partnerships, and hopes to make its object management model an industry standard through the Object Management Group (OMG).

While all is not in the bag—HP's Unix client software will not be available until sometime next year, the distributed version of NewWave is still under development, and not all system services are yet implemented—we think HP's NewWave Office for Unix merits a close look.

The Strategy

COOPERATIVE COMPUTING. HP recognized early the need to migrate to a distributed computing environment. In 1985, HP decided to begin the move from host-based processing to a client/server model.

HP has had "cooperative computing" products on the market for over four years. Having successfully survived the pain associated with such a transition, HP is now moving all of its products in this direction. Just last month, the company formally unveiled its Cooperative Computing Environment Architecture and strategy—NewWave Computing. NewWave Computing is a distributed network computing architecture that allows users to select the appropriate operating system for both the client and server with access to object-oriented services across the network. The ultimate goal is transparent interoperability across networks of heterogeneous systems.

NewWave Office, HP's new office offering, is a cornerstone of NewWave Computing and the foundation for

HP's office-systems strategy for the 1990s. HP's strategy is to provide an open and consistent "enabling environment" based on the following:

• Commitment to industry standards.

• User-oriented desktop metaphor, focusing on the *task* the user wants to perform rather than on the specific *applications* required to do the task. NewWave also masks complexity for the user—complexity of the operating system, file system, application integration, and applications development.

• Choice of server and client platforms.

• Modular integration of applications. The NewWave Object Management Facility (OMF) is key here. NewWave provides several levels of integration, including encapsulation for limited integration of existing applications without modification, and the OMF APIs for creating fully functional NewWave applications.

OFFICE COMPUTING. Prior to announcing NewWave in late 1987, HP had followed the same general path in developing office systems as everyone else did in the minicomputer industry. Original products were time shared and terminal based, with the host performing all of the work. As the PC began to dominate the desktop in the mid '80s, at least some portion of the office processing was moved to the DOS platform, most notably the user interface, local mail functions, and word processing.

With NewWave, HP began a different approach to office. The design center moved to the desktop as HP put together its object management model and introduced the standalone NewWave environment for DOS. NewWave Office, an-
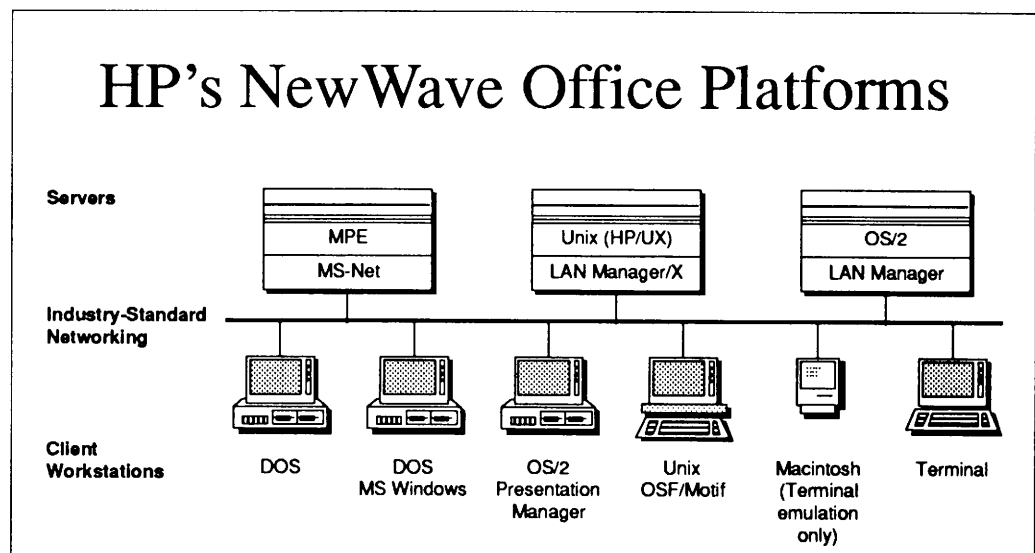

Illustration 1. NewWave Office for MPE and for Unix will be available next month, with an OS/2 server coming in the future.

nounced last November, extends this environment to workgroups. NewWave Office also incorporates new server and client platforms, a key component of HP's strategy. Unix and OS/2 will be added to MPE/XL (HP's proprietary operating system) as servers and to DOS on the client side. (See Illustration 1.)

ROLE OF UNIX. There is no question about the strategic role Unix plays for HP. The company's Unix operating system, HP-UX, is based on and fully complies with AT&T's Unix System V, and HP intends to merge HP-UX with OSF/1 and OSF/2 in the future. HP has developed a strong underlying hardware platform for HP-UX with its extensive family of HP9000 servers and workstations, including symmetric multiprocessing capabilities. The HP9000 series is based on the Precision Architecture RISC (PA-RISC) chip sets and Motorola 68xxx. (See *News and Analysis*, Vol. 5, No. 2, for an analysis of the PA-RISC server announcements HP made this past January, and of the company's agreement with Sequoia Systems.)

In the workstation arena, HP has clarified its strategy with regard to Apollo and will combine the HP RISC architecture with that of Apollo within the next year. The Apollo acquisition also gives HP NCS (Network Computing System) leadership and access to other distributed network computing technology. HP is now integrating Apollo's talented R&D professionals into its own R&D planning process.

Commercial Unix. While it has a strong presence in the technical Unix market, HP is focusing heavily on commercial Unix in its marketing efforts. IBM, on the other hand, is leading with the technical market, and Digital Equipment is having a difficult time bringing its RISC/Ultrix platform into parity, in both functionality and marketing focus, with its proprietary, more robust VAX/VMS platform.

Beyond building an enabling platform for commercial Unix applications, HP is also delivering key applications of its own, including NewWave Office, a network management station, integrated voice/data, and MRP II (HP's OpenMfg).

Another perspective here is that HP demonstrates a sophisticated understanding of the commercial Unix market. Important elements of HP's Unix solution include the OpenSpool/UX commercial spooler for data center management, OLTP tuning for transaction performance, resource-sharing with LAN Manager/X, plans to implement B1 level security at the operating system level, and features to enhance reliability and data integrity (e.g., disk-mirroring and auto restart).

Positioning MPE/XL and Unix. HP is also much clearer than either of its larger competitors in positioning its proprietary

MPE/XL operating environment (which runs on the HP3000 series) vis-à-vis Unix. HP-UX is positioned as the standards-based, open-systems alternative for commercial applications, with MPE/XL offering optimized transaction processing capabilities.

HP is committed to interoperability and coexistence between MPE/XL and HP. One advantage here is that both run on the same underlying PA-RISC architecture. HP is also way ahead of the competition at the applications level. For example, the entire family of Allbase/SQL relational database products runs on both MPE and HP-UX. The interfaces and tools are the same on each platform. The next release of Allbase/Net will allow connectivity between MPE and Unix Allbase databases. Interoperability is particularly important to customers who want to migrate from a proprietary to an open system.

HP's NewWave Office servers
for MPE/XL and Unix will be available con-
currently, and will interoperate at the service level
for both mail and database access.

Office. Thus, it is no surprise that Unix plays a significant role in HP's office strategy. HP's NewWave Office servers for MPE/XL and Unix will be available concurrently, and will interoperate at the service level for both mail and database access. They are also equivalent in functionality, with the same services and application utilities. The only exception is PC hard disk backup, available only on MPE.

HP is acutely aware of the opportunities here, and the fact that its traditional office competitors, IBM and Digital, are sorely behind in the Unix arena. Nowhere to be seen, in fact. They are only talking in general terms about what they intend to do in the future; the only products they can market today are third-party offerings from Uniplex, Applix, and Quadratron. (While DECwrite and DECwindows are both available on Digital's Ultrix platform, there is no equivalent to All-In-1 functionality.) We fully expect IBM and Digital to get their respective acts together and begin to move forward in the Unix office arena, but HP could have a sizeable headstart by then. We may not see OfficeVision on AIX for a couple of years. Digital is still busy cleaving All-In-1 into a client/server mode on VMS, and does not yet have a database on Unix.

Office software competitors such as Uniplex, Applix, and Quadratron have the advantage of running on diverse Unix platforms. HP's approach here is to create alliances with these vendors and interoperate with their products.

In the Unix environment in particular, HP sees the potential for NewWave and NewWave Office to exist on a broad range of vendor platforms. OpenMail, the NewWave Office transport in Unix, is architected for portability, and HP is working with third parties willing to port it to other operating platforms (see box, "Uniplex Extends OpenMail's Horizons," on page 14).

ROLE OF THIRD PARTIES. It is vitally important for HP's long-term success to attract a critical mass of software developers to the NewWave platform. The well-publicized American Airlines move to NewWave has had a big impact in this area. HP is working with both independent software vendors (ISVs) and value-added resellers (VARs) to incorporate NewWave Office into their application products. As we went to press, about 100 ISVs had committed to NewWave.

The focus for ISVs is to make their software products NewWave compliant. One of the obstacles for ISVs in DOS is the requirement to write to MS Windows. Some of the largest and most coveted ISVs (e.g., Lotus, Ashton-Tate, WordPerfect) have not yet committed to implementing Windows versions of their popular applications. However, Lotus recently announced that it will take over responsibility for the existing NewWave browser for Lotus 1-2-3. This was developed by HP (and comes with NewWave) to allow Lotus spreadsheets to play an integrated role in NewWave without requiring Lotus to write to NewWave. While this is not a full commitment to NewWave, Lotus will enhance the browser to support Release 2.2 (e.g., memory enhancements and support for color).

VARs are encouraged to incorporate pieces of NewWave Office, such as Information Access, into their vertical applications written for the mini server. VARs can also convert their applications to the cooperative processing model, separating the client and server components.

OEMS. HP is actively pursuing OEMs for NewWave, offering NewWave, the OMF, and network object-sharing for licensing by other computer vendors. This is part of HP's approach to make NewWave a de facto industry standard. Data General has licensed NewWave as the front end for its CEO Object Office product. AT&T and NCR have licensed NewWave for the DOS clients in their new client-server environments. Canon has also licensed NewWave and is developing a Japanese version on all three client platforms—DOS, Unix, and OS/2—for HP.

Can HP Sell NewWave as an Industry Standard?

HP WANTS TO SEE NewWave adopted as a de facto industry standard and has two primary efforts underway. In addition to offering NewWave for licensing to other vendors (see OEMs), HP would like to see the NewWave Object Management Facility (OMF) adopted as a standard by the Object Management Group (OMG). The OMG also has an agreement with X/Open, allowing X/Open to incorporate OMG-approved standards where appropriate in the X/Open Common Applications Environment (CAE), and OMG specs into future versions of the X/Open Portability Guide (XPG). As X/Open gains credibility, it will provide a big boost to the acceptance of the OMG's efforts.

Adoption of a standard object management model is one of the primary goals of the OMG. This will provide the foundation for heterogeneous object-sharing and avoid the development of multiple object models in the industry. The object model will include standards for object definition, class libraries, and facilities for managing, accessing, and working with objects. Although the NewWave OMF does not have any real competitors at this point for what it offers, it does not yet provide a full object model. For example, the OMF lacks inheritance and distributed object facilities, features that are of major interest to the OMG. Therefore, we expect a compromise of some kind, with OMG members in addition to HP contributing to the final standard.

COMPETITIVE ADVANTAGE. By allowing other vendors to license NewWave, isn't HP giving up a significant competitive advantage? The answer is no, since HP is not giving its crown jewels, the NewWave source code, to licensees.

THE PRESSURE IS ON. The existence of a well-designed, object-oriented user environment like NewWave places enormous pressure on other vendors in the industry once customers understand the advantages NewWave gives them over more traditional approaches to office systems. Do these vendors invest in the time and effort to develop and implement their own object model, or do they succumb to HP's success and then figure out how to differentiate themselves from other vendors also using NewWave?

One area of leverage for HP is the development time spent on NewWave. One estimate we've heard is 500 man-years. Although HP has already worked through many complex issues, and although the existence of its NewWave solution would potentially make the development effort easier for someone else, the development time concern certainly doesn't become trivial. HP states that a large portion of its NewWave development time was devoted to the OMF. It would take considerable time and extensive expertise for a competitor to duplicate this effort.
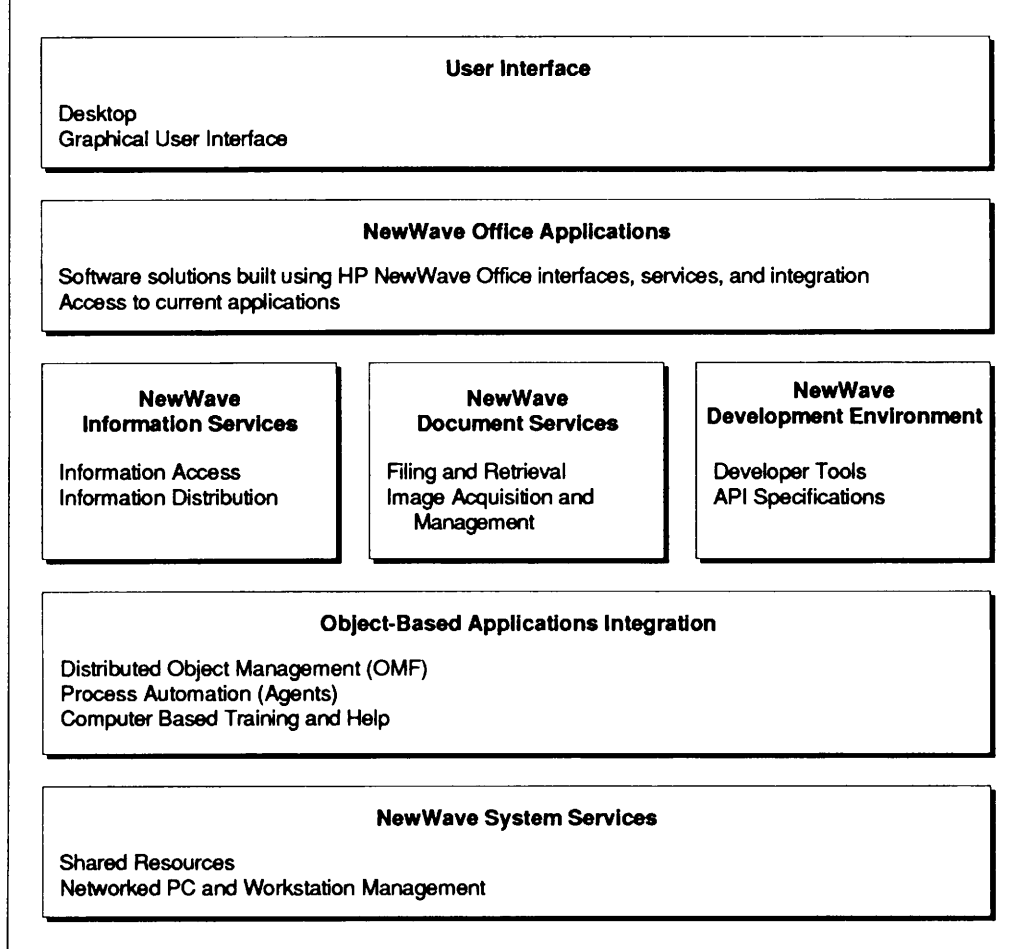
NewWave Office Functional Definition

User Interface

Desktop
Graphical User Interface

NewWave Office Applications

Software solutions built using HP NewWave Office interfaces, services, and integration
Access to current applications

NewWave Information Services

Information Access
Information Distribution

NewWave Document Services

Filing and Retrieval
Image Acquisition and Management

NewWave Development Environment

Developer Tools
API Specifications

Object-Based Applications Integration

Distributed Object Management (OMF)
Process Automation (Agents)
Computer Based Training and Help

NewWave System Services

Shared Resources
Networked PC and Workstation Management

Illustration 2. NewWave Office adds network services to the NewWave desktop environment.

NewWave Office

The first implementation of HP's NewWave Office framework consists of:

- NewWave environment (a single-user license is included)
- Networked object-sharing
- Information distribution (mail system)
- Information access (access to databases across the network)
- Shared resources
- Networked PC management

The NewWave environment currently provides the graphical NewWave desktop, NewWave Write (a compound document processor), a Lotus browser (for viewing Lotus spreadsheets within NewWave objects), a Help function, computer-based training (CBT), and the encapsulation software. Agents are not yet implemented but will be included in a later release.

NewWave Office extends the scope of NewWave beyond the individual desktop to the workgroup, providing access to network servers, services, and data (see Illustration 2). We will first give some background on the NewWave Office platforms. Then we will describe what the standalone NewWave environment offers, followed by a description of the NewWave Office extensions.

SERVERS. HP has committed to three NewWave Office server platforms:

- NewWave Office for MPE, available in May.

- NewWave Office for Unix, on an HP9000 (series 600 and 800) running HP-UX Version 7.0 or later. This will also be available in May.

- NewWave Office for OS/2 on a 286/386 PC running the OS/2 operating system. HP has not announced a date for availability of the OS/2 version of NewWave Office, and has not yet committed to putting the networked PC management functions on OS/2.

CLIENTS. On DOS, NewWave uses Microsoft Windows to provide capabilities that the operating system lacks (e.g., a messaging system and context-switching). The NewWave developer on the DOS platform must write to both Windows and the NewWave APIs to get a fully compliant NewWave application. On the Unix and OS/2 platforms, however, these capabilities are part of the operating system, and the developer will not be required to write to a particular windowing manager.

DOS. The NewWave DOS client software runs under Microsoft Windows, the de facto standard for window management on DOS. The only version of Windows that NewWave accepts currently is Windows/286 Version 2.11. HP chose not to imple-

ment NewWave under Windows/386 but to wait for future versions of Windows. Version 3.0 is currently under development and due out this summer.

The recommended configuration for NewWave is a 386 or a fast 286 (minimum 12 MHz for performance reasons) with 4MB memory, a 1.2MB 5.25-inch or 720K 3.5-inch disk drive, 20MB of hard disk storage, and a Microsoft Windows-supported mouse. Required software is DOS 3.2 or higher and Windows/286 2.11.

If you don't want to use the NewWave graphical interface, the NewWave Office DOS client also comes with Personal Applications Manager, a character-based, menu-driven DOS interface.

Unix. The NewWave client for HP's Unix platform will use Motif as the windowing manager. (Motif is the Open Software Foundation's user interface spec based on a Presentation Manager look with X Window APIs underneath.) HP VUE, HP's implementation of Motif, will ship this summer; the company is building NewWave for Unix on top of this. HP may decide to bundle HP VUE with the NewWave software. (With Windows 3.0, Windows, Motif, and Presentation Manager will look almost identical to the user.)

The Unix client is not available yet, and HP has disclosed no dates for this. However, the NewWave Developers' Kit for Unix will ship by the end of this year. The end-user client software will probably appear six to nine months later.

Until the Unix client software is released, Unix workstations will be limited to terminal emulation access to NewWave Office services such as mail and shared resources.

OS/2. The OS/2 client is also not available yet, but HP states that the NewWave Developers' Kit for OS/2 Presentation Manager will ship at about the same time as the one for Unix.

HP is still deciding which client to release first—Unix or OS/2—and is currently working hard on the development of both. This has become an even more difficult issue with the advent of Unix/386. The company is monitoring closely the demand for OS/2 vs. Unix/386 vs. HP's RISC/Unix platform. The company views OS/2 as the successful follow-on to DOS, and a particularly good platform for HP since it has focused so heavily on integrating the DOS platform into its office strategy. While Unix is probably more important to HP commercially in the short term, the company views OS/2 as very important in the long term.

Macintosh. Since the Macintosh already has a graphical user interface, customers with Macs are not exactly beating down the door to get NewWave on this platform. They are much more interested in access to network services, which is the focus of HP's efforts. The priorities are to provide terminal emulation over a LAN, access to print- and file-sharing, client mail access, and client database access.

The NewWave Environment

THE NEWWAVE DESKTOP. The NewWave desktop, or office window, displays two types of icons: tools and objects. Tools are applications that perform some task for you, e.g., the Printers icon is a tool for printing an object. You activate a tool by dropping an object on it, or, in some cases, by double-clicking on it (e.g., a clock). Objects are applications that create and manage datafiles. A NewWave object, in fact, represents both the data and the application that created it. You open an object by double-clicking on it with the mouse. This opens the datafile and launches the application that created it. Currently, the icons are not in color; with the Windows 3.0 release of NewWave, NewWave will implement a customizable color scheme for the icons.

Tools. Tools, represented as three-dimensional icons, include the Wastebasket, Printers, File Drawer, Information Access (optional software), the Agent (which sports shades and looks like Clark Kent—unassuming but powerful), MS-DOS Commander, Dictionaries, Slide Show, Executive Insight (optional), and Clipboard. The user can also add tools through encapsulation. Obvious examples here would be MS Windows applications such as the Calculator and Clock. Other interesting tools might be a fax machine or a telephone dialer. NewWave has a "manage tools" option, allowing you to choose which ones you see displayed on the desktop.

> *The Unix client is not available yet, and HP has disclosed no dates for this. However, the NewWave Developers' Kit for Unix will ship by the end of this year.*

Objects. Objects are represented by two-dimensional icons. During installation, NewWave creates the master NewWave objects, such as Folder, Agent Task, Drawing Object and Chart Object (both part of HP's Gallery Collection software), NewWave Write, NewWave Image (an application for displaying an image scanned with HP's ScanJet) and Bridge Builder. The user can also instruct NewWave to encapsulate over 20 DOS applications for which HP has already created bridges. NewWave then adds these as master objects as well.

Creating Objects. To create a new object, you first get a display of the icons that represent the current object types, called *masters* or *master objects*, that the user can create. You select the type of object you want to create and give it a title. A new icon is then added to your desktop; the icon looks the same as that for the master object, and the title you entered is displayed under the icon. You then just double-click on the new object icon to open it. This activates the application and allows
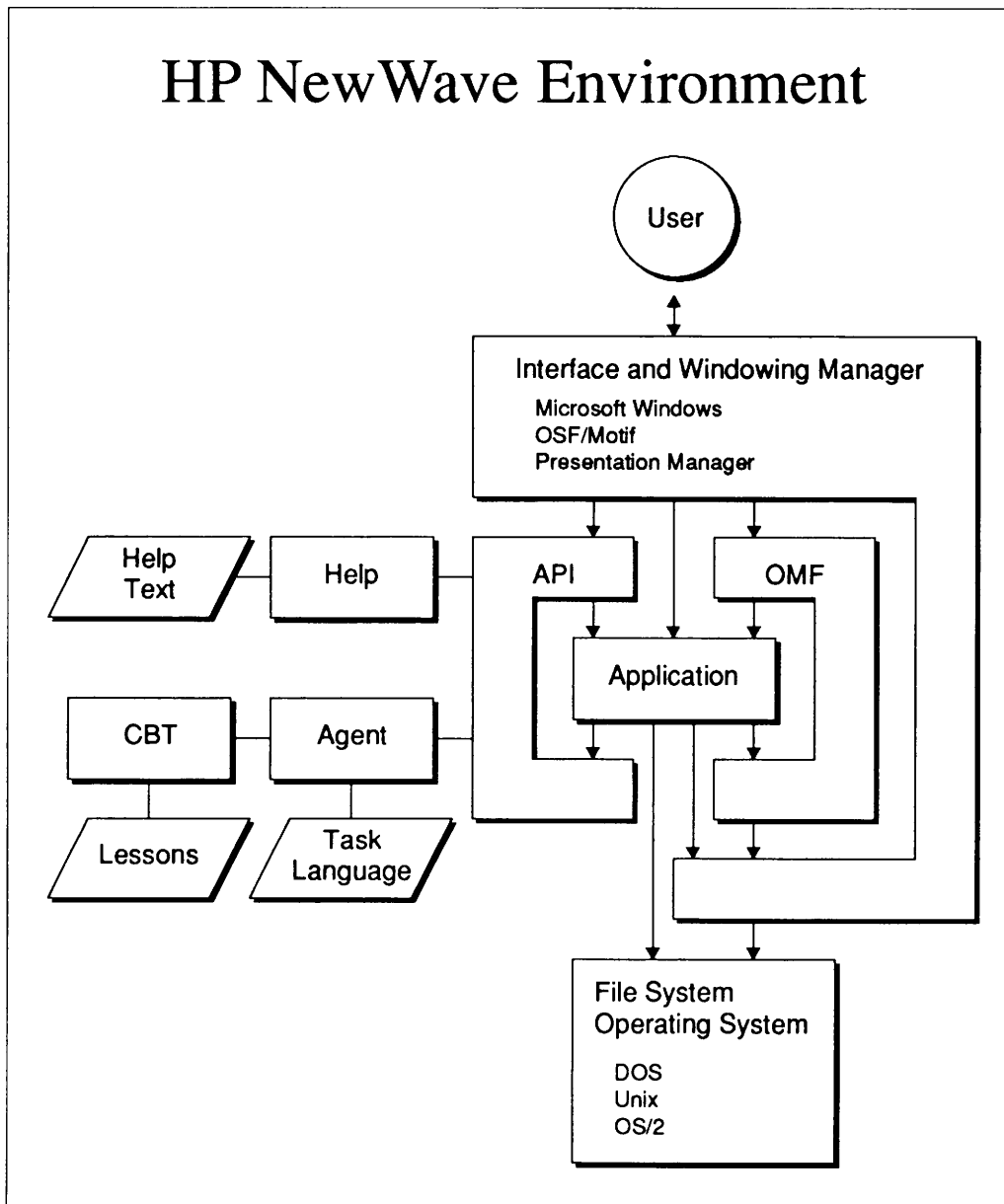
HP NewWave Environment

Illustration 3. On its client desktops, NewWave uses industry-standard window managers for the user interface and adds its own set of APIs. Writing to the Object Management Facility (OMF) provides features such as iconization, direct manipulation of objects (drag and drop), and application integration. Writing to the API provides access to help, computer-based training, and the agent facility for cross-application macros. The developer writes to both the NewWave and the window manager APIs to obtain a fully NewWave-compliant application. HP is working with third parties to provide tools to ease the development process.

the option to see more of the icons at once on the screen when we create a new object.

You can create templates and add these as options when creating new objects—for example, a standard letter created with WordPerfect or a budget framework in Lotus 1-2-3. (See Illustration 4.)

Manipulating Objects. HP has been consistent with Windows conventions in the manipulation of objects. All of the mouse movements in NewWave for copying and moving objects are the same as in Windows.

NewWave also provides the ability to *share* one object into another object or into other multiple objects. This creates a live link between the original object and the shared version of the object. When you change one display of the linked object, all of the linked versions change. A shared object can be thought of as multiple displays of the same object.

The file cabinet and folders represent local files on the desktop. Folders can be nested to an unlimited level. Objects are filed in a folder by dragging them to the folder icon. An object can be removed from the folder the same way—by picking it up out of the folder and dropping it back on the desktop.

Object Attributes. The Object Menu item displays information such as the object

you to add data to the object.

When creating a new object using an encapsulated DOS application, NewWave restricts you to a title that conforms to DOS file-naming conventions. NewWave precedes the title with "DOS:" to show that the object was created with an encapsulated application.

It is very easy to reorder the list of master objects, e.g., to put folders first if you work with them a lot. We would also like

creator, date created, and the number of links an object has— the number of parent objects and number of children (objects displayed within the object). The number of links changes only when shared copies are made. A third-party vendor, Dexotek, is developing a product that enables the user to quickly find objects on the desktop. When you click on an object, it will show graphically how and to what the object is linked. It will also find any object on the desktop instantly.

OBJECT MANAGEMENT FACILITY. The NewWave OMF provides a database-like function, keeping track of the status and relationships of all objects on the desktop. The OMF gives the user ease-of-use and consistency across platforms. It hides both the operating system and the underlying filing system from the user, making the NewWave interface and filing system the same regardless of operating platform.

The OMF provides the following:

- Binding of data and applications into objects. When you create a Lotus spreadsheet, the OMF links the spreadsheet to the Lotus application. When you double-click on the icon for the spreadsheet object, the OMF knows to activate Lotus.

- Management of information links between objects. Information links are views of data from one object contained in another object. An example here is a compound document containing a range of cells from a spreadsheet. If you double-click on the spreadsheet from within the compound document, the OMF knows to activate Lotus and open the spreadsheet. When you exit from Lotus, you are back in the compound document again. Currently, the OMF only has to keep track of links among one user's objects on the desktop. No links are maintained across the network.

- Horizontal integration. Every application written to the NewWave APIs gets "instant integration" with all other NewWave-compliant applications. Once an application incorporates the necessary OMF calls, it does not need to know anything about any other application on the desktop to achieve integration. Each application has to know only its own processing and how to express itself when asked by the OMF. The OMF takes care of all of the links and communication between objects. Thus, the developer can use NewWave applications as interchangeable parts in building more complex or specialized applications. Horizontal integration facilitates the rapid assembly of new applications with the opportunity for a sig-

nificant productivity improvement. Horizontal integration is one of NewWave's most significant competitive advantages.

ENCAPSULATION. Encapsulation builds a software shell around a non-NewWave DOS application to allow it to work in an object environment. This shell essentially provides communication between the application and the OMF and the agent facility. Thus, the user does not have to wait for the application developer to migrate to the full NewWave environment before incorporating a favorite application program. This modular approach comes the closest of any we've seen yet to offering the user the option to choose "best in class" and get at least some minimal level of integration.

Both standard DOS and MS Windows applications must be encapsulated to work within NewWave. Encapsulated DOS applications will continue to take over the full screen; Windows applications will still come up in a window on the desktop. Encapsulation is done with the Bridge Builder object and provides the following:

- Binds the data to the application and displays the resulting object as an icon on the desktop, permitting it to be manipu-
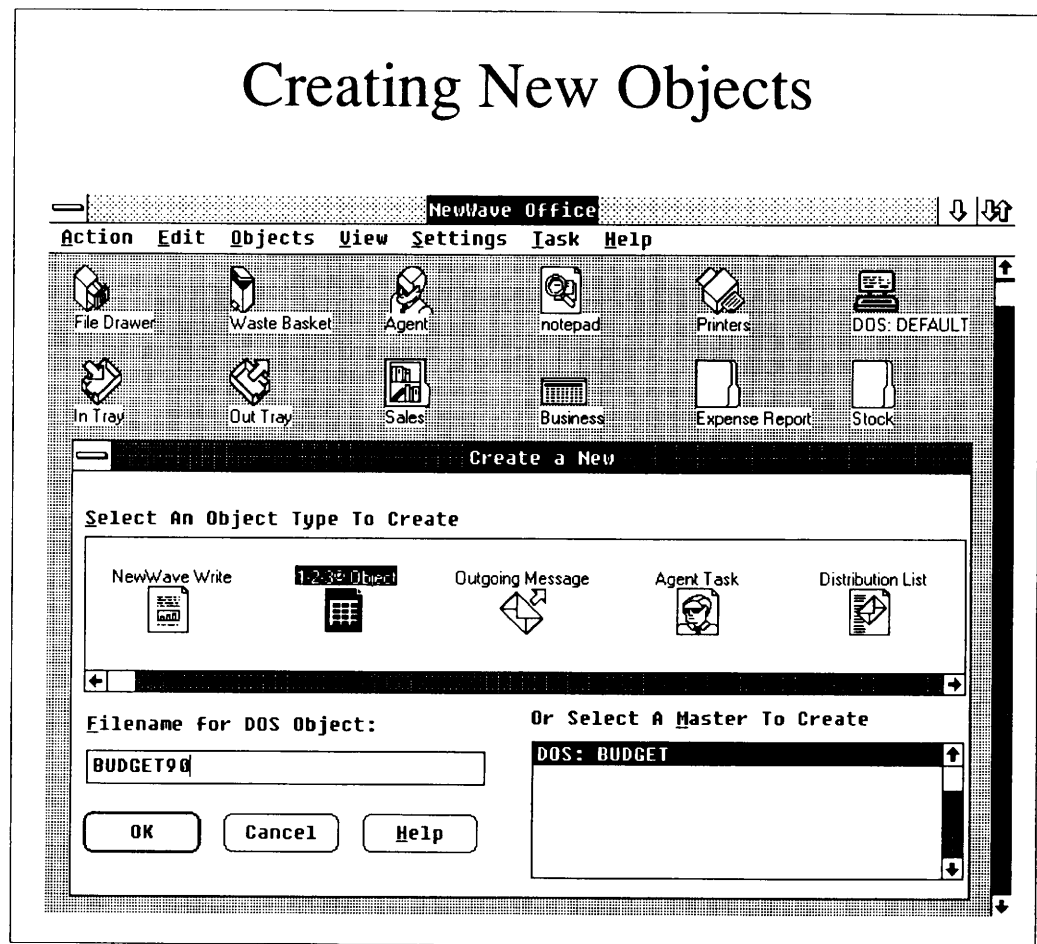

Illustration 4. Here is the dialogue box for creating a new object, in this case, a Lotus 1-2-3 object using DOS:BUDGET as a "master" or template spreadsheet.
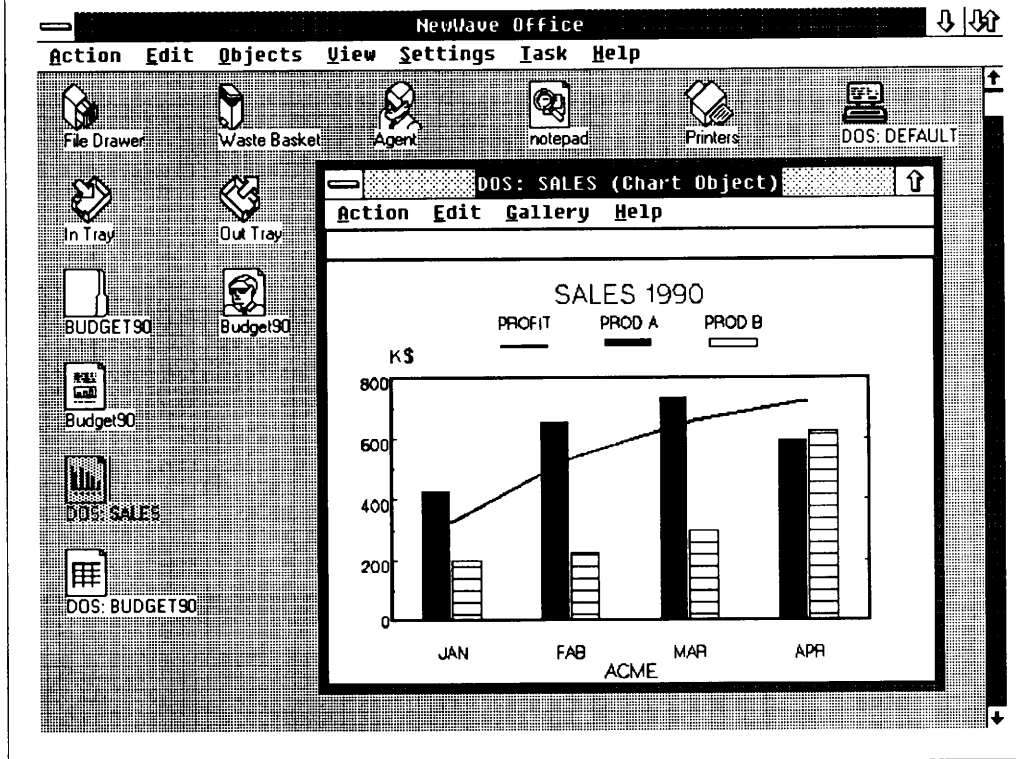
Invoking NewWave Objects

Illustration 5. When you open a NewWave object, its icon is grayed on the desktop and the OMF automatically launches the application that created the object. The title bar of an object shows both the name of the object and its type.

flow control commands such as if/then/else and do while (see Illustration 6). Working with the task language is like learning and using any 4GL. Context-sensitive help is available as is full dialogue box capability within agent tasks. Agents can also be nested.

You execute an agent task by dropping it on the Agent tool. Agent tasks can also be automatically triggered by an event or a specified date/time. Since DOS is single-tasking, you cannot do anything else while the agent completes a task. In Unix and OS/2, HP will implement multitasking background agent tasks.

Availability. Agents are not yet available in the standalone version of NewWave. With Release 1 of NewWave Office, agents will be able to automate Information Access and AdvanceLink tasks only by executing command files. Release 2 will add the ability to record agent tasks, create an agent task across multiple applications on the desktop, edit an agent task using the task language, and set up timed agents. The capabilities of Release 2 are already available in the NewWave Developers' Kit but can only be accessed and used within a single application.

lated as a NewWave object. You choose an icon from a library provided by HP, or create your own if you have the Developers' Kit.

• A cut-and-paste option (text or graphics data only) between the DOS object and other objects on the desktop. This is done via the Clipboard.

• Context-switching between the DOS application and the NewWave desktop.

• The ability to include the application in agent tasks.

AGENTS. Agents provide a powerful procedural automation, or cross-application macro facility, within NewWave. An agent can automate anything you can do within the NewWave environment.

An agent task is created by simply recording the steps you want the agent to perform when activated. You modify the resulting script using the agent task language; this includes

HELP AND CBT. NewWave includes a context-sensitive, point-to-screen Help function with hypertext-like capability. The NewWave CBT lessons teach all elements of the NewWave environment. They are designed to make even those users who have had no experience whatsoever with windows, mice, or objects quickly comfortable with NewWave. The CBT actually drives the live software in the system; it is not just a set of screen captures or simulations of the desktop.

NEWWAVE WRITE. Although NewWave Write is not a sophisticated word processor, it provides an easy-to-use compound document editor. This is its real value in addition to basic editing and formatting capabilities. HP is looking to third parties to provide high-end WP requirements within the NewWave environment (e.g., Samna's Ami Professional).

Compound Documents. When you get to a point in the document where you want to include another object, you copy, move, or share the object into the document. Live (hot) links between objects in NewWave are created by sharing one object into another. (There are no "warm" links in NewWave; the user is not given the choice of whether or not to update a linked object.)

When you double-click on the object in the document, NewWave opens the object and activates the application. (See Illustration 7.) All NewWave Write knows about an embedded object is its name, its size, and where it is in the document. When the object is activated, NewWave Write calls the OMF, and the OMF calls the application, instructing it to display itself in a window.

The compound document facility only works for full NewWave applications and encapsulated applications that have browsers. A browser knows how to display the data format for a non-NewWave application. HP has written browsers for Lotus and its own Gallery Collection. If a vendor doesn't want to modify or write an application to embed OMF calls, it can instead write a browser (HP provides specs for this), allowing objects created by the application to be included in other objects (but not vice versa).

When a compound object is mailed, NewWave makes a copy of all linked objects for the recipient; no links are maintained across the network in the current implementation. The recipient must have the application locally to edit the linked objects. The recipient can use the browser to at least view and print the data if the application isn't available.

DEVELOPER TOOLS. Effective development tools are a critical factor in getting ISVs committed to the NewWave platform. The easier it is to modify existing applications and create new ones without writing a lot of code, the more attractive the migration to a new environment. This is an issue faced by all of the systems vendors as they push new architectures and APIs. Although HP will develop some tools for its specific customer operating requirements (e.g., Cobol or transaction processing), it

will rely primarily on third parties for tools.

Version 2.0 of the NewWave Developers' Kit for DOS was released in February, adding tools to take full advantage of agents and the CBT facility. Versions for Unix and OS/2 will follow later this year.

A number of ISVs are already developing NewWave tools in the DOS environment, e.g., Glockenspiel, Caseworks, Systems Interface. Candlelight Software will introduce WaveBuilder, a CASE/expert system tool for developing NewWave applications from scratch, by mid-1990. Some, like Glockenspiel, are also active in the Unix and OS/2 arenas. For Unix, HP is developing some tools itself, looking at Apollo-developed tools, and recruiting third parties.

NewWave Office Extensions

NETWORK OBJECT-SHARING. The first major step toward full distributed object management is sharing objects across the network. In NewWave Office, objects can be stored on any server on which a share (virtual drive) can be defined.

A network folder (a Network Object Storage object in NewWave) is a container for objects stored on a server. The network folder essentially provides a window to a server, point-
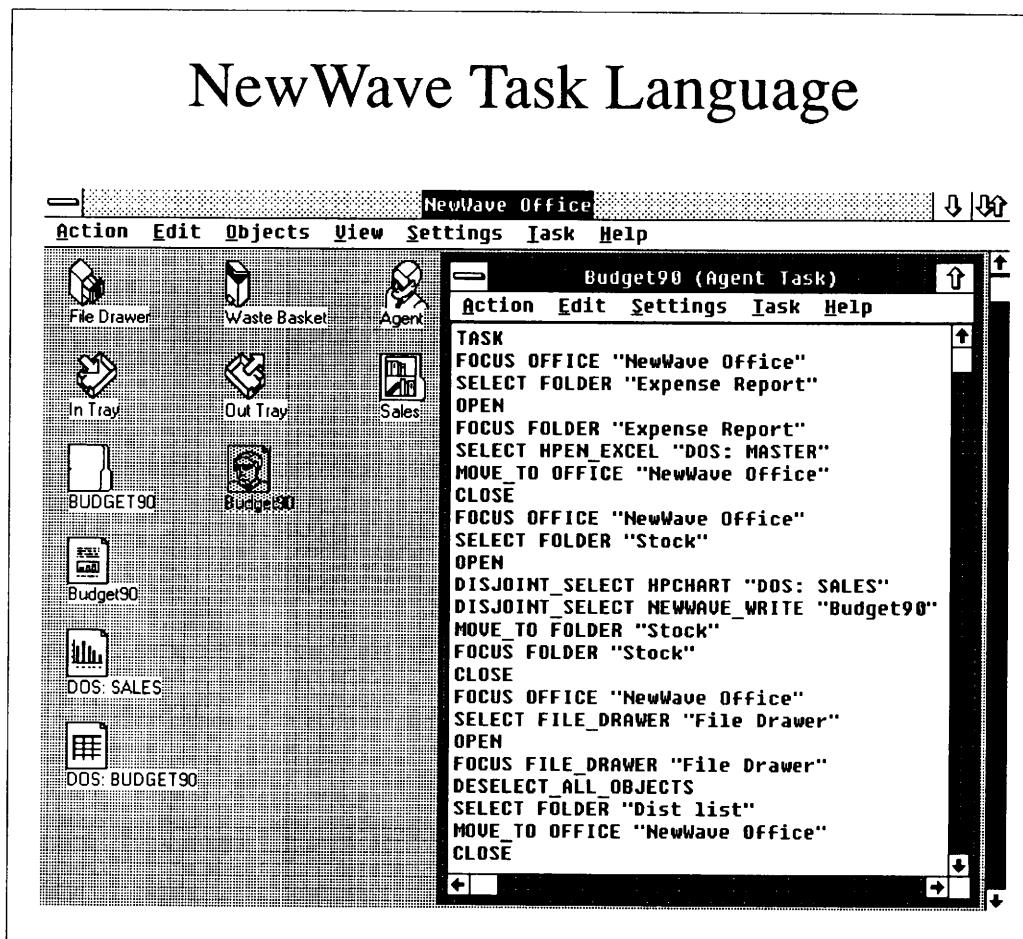

Illustration 6. Here is a sample agent task showing the task language.

ing to a specific share, or subdirectory, on that server.

You can copy or move an object to a network server by dropping the object on the network folder. In the case of a compound object, all of the embedded linked objects are also copied to the server as part of the compound object. Thus, the live links are not maintained across the network to the original objects. Network-wide live links will come with the distributed version of NewWave.

All objects in a network folder are available to anyone with access to the share. In addition to copying or moving objects contained in a network folder, there is also a check-out/check-in facility. If you want to work on an object in the folder, you explicitly check out the object; you cannot double-click on it to open it. Once checked out, the object will be grayed-out in the folder. Another user can now *copy* the object from the network folder, but cannot open the object in the folder. And the second user will not be allowed to refile the copy in the network folder under the same name if the original object is still in the folder.

You just drop the object back on the network folder to check it in. You can see who has checked out an object, and the system administrator can force something to be checked in.

Creating a share creates an index on the server to maintain information as to what objects are stored there, which ones are checked out, and by whom. When someone drops an object on the network folder, the index is updated and the object is put on the share in a specially formatted object file. There is only one index per share, although it is possible to have multiple network folders pointing to the same share (see Illustration 8).

MAIL. HP OpenMail, HP's standards-based mail server for HP-UX, is the mail transport service for NewWave Office for Unix. It provides native X.400 P1/P2 compliance, conforms to X/Open portability specs, and uses Sendmail, an established Unix transport system, for the transmission of messages. HP is porting OpenMail to the OS/2 server as well.

The mail transport on NewWave Office for MPE is the DeskManager mail server, which will interoperate with Open-Mail on Unix. Thus, in a mixed environment, an MPE server can use OpenMail for X.400 connectivity rather than adding on the MPE X.400 gateway, Office Connect for X.400. OpenMail will also have access to mail gateways supported by DeskManager (e.g., IBM's PROFS, DISOSS, and HP Telex). A fax gateway for both DeskManager and OpenMail will ship this July.

HP has well-developed online directory services of its own, and is committed to supporting X.500 on both Unix and MPE in the future.

OpenMail is available in English, German, and French; multiple languages can run concurrently on the same system.

NewWave Mail. NewWave Mail, the NewWave Office client software for mail, runs only on DOS today. NewWave Mail uses the In-Tray and Out-Tray desktop tools plus the distribution list and outgoing envelope objects. Rather than explicitly invoking a "mail" application to send an object in NewWave, you simply create an object and drop it on the Out-Tray icon. Up comes a dialogue box for entering addressees. Then you select whether to mail or hold the object(s). If you hold them, the envelope is placed on the desktop. If you mail them,

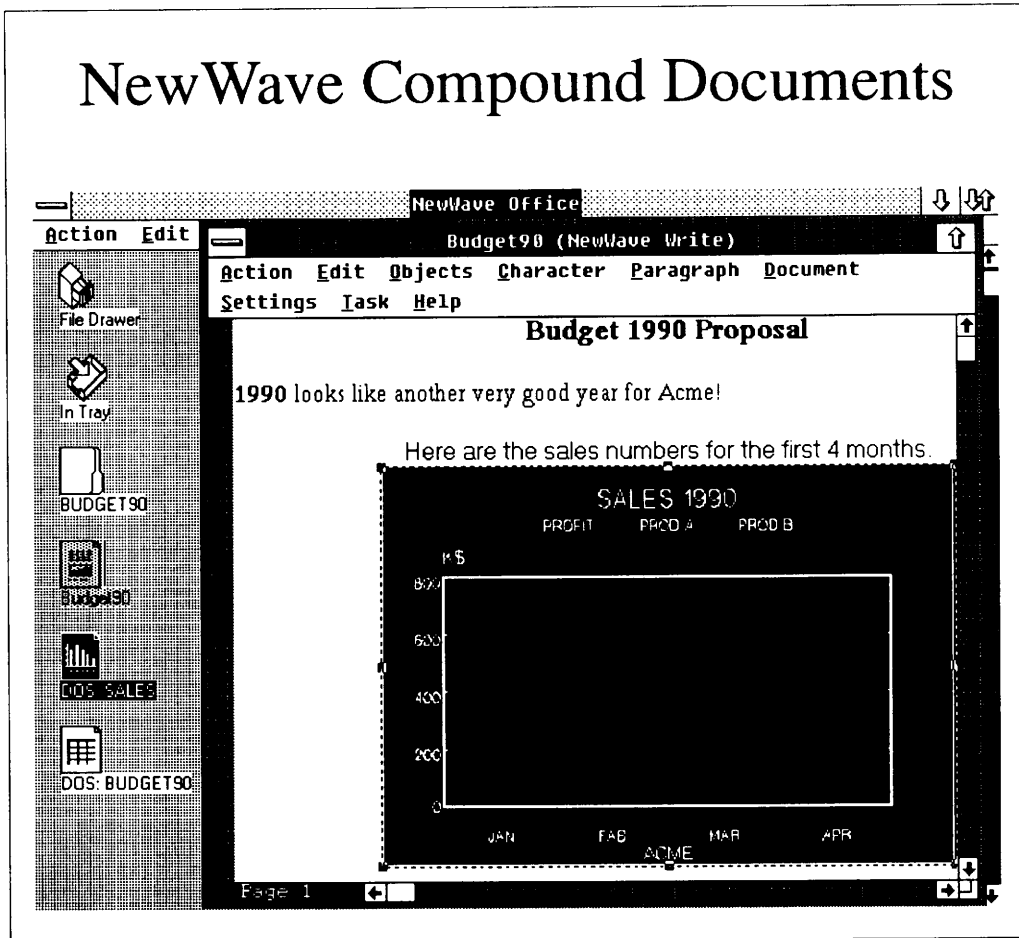## NewWave Compound Documents

Illustration 7. A NewWave Write document with a linked chart object embedded in it. You can open the linked object from within the NewWave Write document simply by double-clicking on it.

the envelope can be sent with immediate or deferred delivery. HP has managed to engineer immediate background delivery of mail on the single-tasking DOS platform. While the mail is being sent to the server, you can continue to work.

In NewWave, you do not have an automatic option for creating a cover memo or short message after entering the addressees. This approach is different for those of us used to an existing E-mail system. The idea is to create all of the objects to be mailed, and then put them in an envelope and send them. A cover memo would simply be another object dropped in the envelope. We would, however, like the option to enter a short cover message after addressing the envelope, and have this displayed for the recipient when the envelope is opened.

Any object on the desktop can be mailed. You can drop a distribution list on an envelope to address it. As part of your mail profile, you can specify whether you want to always mail the original object or have NewWave automatically mail a copy.

Networked Object-Sharing

Server Storage

object 1
object 2
object 3
object 4
object 5
object 6
object 7

Share configured as "share1" with unlimited access and a password of PASS1.

Share configured as "share2" with read-only access and no password.

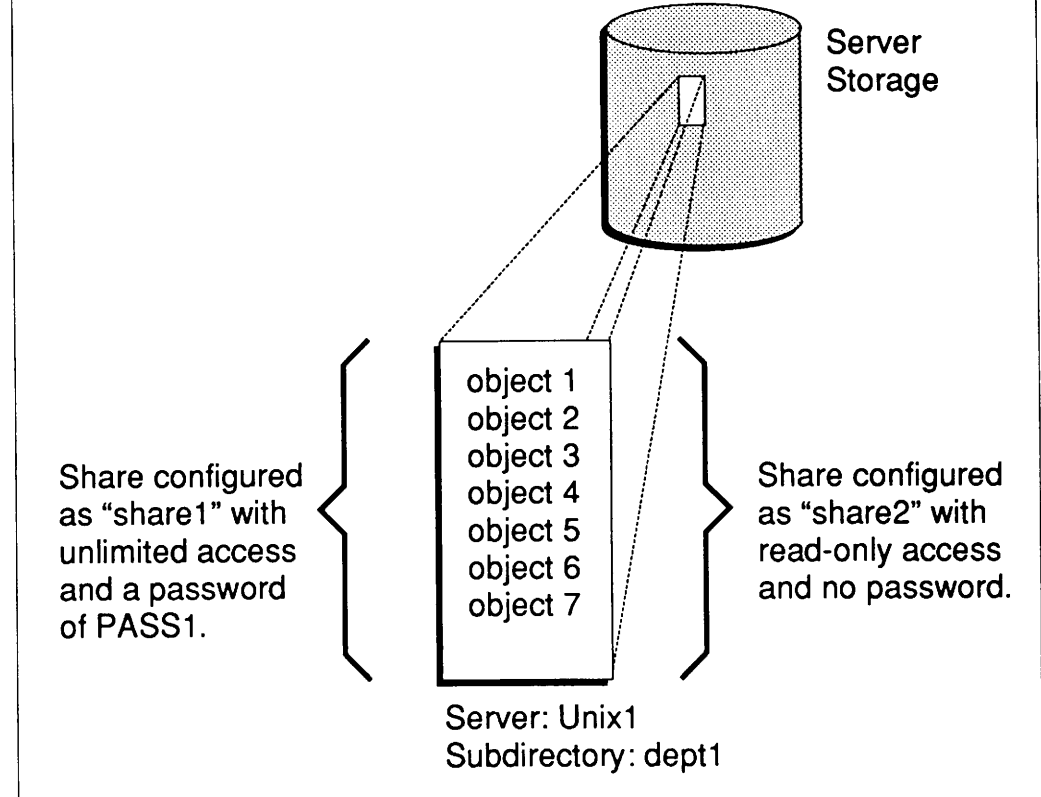Server: Unix1
Subdirectory: dept1

Illustration 8. When you define a share in NewWave Office, you specify its location (server and subdirectory), the level of access the share has to the files stored there, and an optional password. The user can then create a network folder that points to the share. A network folder pointing to share1 will contain exactly the same objects as a network folder pointing to share2, but the users of the two folders will have different access privileges and passwords.

Other Desktop Options. AdvanceMail III is the non-New-Wave PC DOS client for both OpenMail and DeskManager. Unix workstations and terminals access OpenMail via terminal emulation (which looks like AdvanceMail). In the future, HP will have a Motif-based OpenMail client for Unix.

PC LAN Mail. HP is approaching PC LANs from two directions. First, it is porting OpenMail to run on PC-based LAN servers. It will be available on SCO Unix/386 in September and on OS/2 by the end of the year. Second, HP is working with 3Com to jointly provide a gateway between OpenMail and 3Com's 3+ Open Mail. We expect this by year-end. HP also supports Novell LAN PCs via the HP NS LAN gateway on MPE.

INFORMATION ACCESS. HP considers its Information Access product a key differentiator and an important part of NewWave Office. It is a true client/server application, providing access to both remote and local databases. Currently, the client is a character-based DOS application, encapsulated within NewWave. It will be NewWave compliant later this year. The server software, available on both MPE and Unix, accesses HP's Allbase/SQL and Oracle (Unix and MPE), and TurboImage and KSAM (MPE only). Access to IBM's DB2 is available on a custom basis, with full integration coming in future releases. Local PC databases can include Lotus, dBase, and R:base.

Access provides read-only access to server databases. Once you specify the server, Access then displays the databases you have permission to access. Concurrent access to both re-

Uniplex Extends OpenMail's Horizons

A MAJOR FACET of HP's strategy is to license OpenMail to other Unix vendors in an effort to make it the de facto Unix mail system. Uniplex, with its strong integrated office offering, was a natural target and the first to grab the OpenMail offering. In January, HP and Uniplex announced an agreement from which both will reap significant benefits.

Uniplex will integrate OpenMail as the mail transport into its Uniplex Office product by early 1991, replacing its own mail system. OpenMail will provide key enhancements for Uniplex—improved directory management and system management, native X.400 capability, and interoperability with other standard Unix mail systems.

HP gets three major benefits from this relationship. First, HP will sell the full Uniplex Office product line on the HP platform, except the Uniplex DOS software. Since NewWave Office doesn't address server applications for terminal users, Uniplex Office will fill this gap for HP. OpenMail on both platforms will ensure mail interoperabil-ity for all users.

Second, Uniplex represents the first and largest "domino" in the Unix arena in HP's quest to establish OpenMail as a de facto standard on open systems. Since Uniplex Office runs on over 200 Unix platforms, this alone will give HP a strong presence on a wide variety of systems.

Third, Uniplex is assisting HP in porting OpenMail as a standalone product to the top 20 or so Unix platforms—Sun, IBM's AIX, Digital's Ultrix, etc. This gives HP a foot in the door and a great opportunity to compete for the enterprise communication backbone in Unix. Having a single mail system accepted across multiple platforms overcomes the problems inherent in trying to integrate directory, admini-stration, and file exchange services across disparate mail systems. An interesting note here is the fact that HP's Open-Mail will arrive on IBM's and Digital's doorsteps (this summer) before they introduce their own Unix mail prod-ucts. (Digital does have mail within DECwindows, but this is not its new X.400 offering yet.)

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mote and local databases is not available yet. However, you can selectively move tables or subsets of tables from one source to another, bringing tables together to perform joins on a common server.

Queries and Reports. When selecting columns from multiple tables, Information Access figures out the join column if the columns have the same name. You can request sample values if you need to know how data is entered in columns; do a further query on the result or refine the query; sort the results; calculate summary data (e.g, total, average); select from many output formats (including Lotus, dBase, and R:base); and copy data to the NewWave Clipboard using the Encapsulation menu. Infor-mation Access has its own report writer and command lan-guage, and NewWave agents will be able to access procedures written with the command language.

DOCUMENT SERVICES. HP's first NewWave document serv-ice will be its Advanced Image Management System (AIMS), announced this month for delivery to targeted developers in May and for general availability in August. This toolkit for cre-ating image-capable applications includes a 4GL and a user-interface builder. It adheres to the client/server model, with the front end running on DOS and the server on the HP9000 and SCO Unix/386 platforms.

The underpinning for HP AIMS is the Plexus XDP system, which, in turn, uses the SQL-based Informix database to man-age image storage. HP has added support for HP peripherals and networking, plus the NewWave client environment. The client HP AIMS software is encapsulated and will eventually be a full NewWave application. HP AIMS supports optical storage devices, including jukeboxes, and CCITT Group 4 image compression.

Application development is done on the PC, producing Windows applications without requiring expertise in Windows or C programming.

SHARED RESOURCES. Resource-sharing for NewWave clients (e.g., access to files and printers) is provided by MS-Net (MPE), LAN Manager/X (Unix), and LAN Manager (OS/2). In the initial release of NewWave Office, HP will not include LAN Manager/X support on the DOS client. This will be provided through a compatible MS-Net-based OfficeShare client that permits full shared-resource capability with HP LAN Manager/X. The LAN Manager/X client will come with the second release of NewWave Office for Unix (late 1990) and will be supported as a separate product this summer. HP also plans to support LAN Manager on MPE in the future.

NETWORKED PC MANAGEMENT. One of HP's primary ob-jectives was to make a NewWave Office LAN easy to install and administer. Networked PC management provides several services to minimize the effort required. It automatically con-figures the server, assigns node names and addresses, identifies shared peripherals, establishes default public and private shares, and configures client software for each networked PC.

All of the software for both the server and the clients is distributed on a single tape set; the administrator can download the PC software from the server.

NewWave Office also provides important PC backup services. With an MPE server, each PC hard disk on the network can be backed up to a tape device using unattended store/restore. Backup is initiated by the PC user (not the server—a DOS limitation) using a menu interface. The user can choose to back up either entire files or just changes to DOS file data, and can request a restore at any time. MPE servers can also provide PC hard disk backup for clients connected to Unix and OS/2 servers.

Both MPE and Unix servers can automatically back up any DOS files stored on the server as shared objects during system backup.

Future enhancements to NewWave Office system services include unattended automation of software distribution for third-party DOS applications, the addition of utilities to manage PC software usage (e.g., version and license control), server installation of LAN Manager clients, a graphical user interface for the administrator, and central control of networks with multiple LAN servers.

PACKAGING. The user can buy NewWave Office with both mail and Information Access or with just one of these services. With NewWave Office, HP is introducing user-based pricing.

Futures

In addition to the many enhancements we have already mentioned in our discussion of NewWave Office, developments are underway in several other major areas.

OBJECT TYPES. HP will incorporate other technologies that are fundamentally important to a full information system. These include voice (see *News and Analysis*, Vol. 5, No. 2, for an analysis of HP's Applied Computerized Telephony (ACT) platform and the impact this will have on voice processing in HP's environment), video, etc.

DISTRIBUTED NEWWAVE. Having the OMF capability at the server level is critically important to the next generation of NewWave Office. As you put multiple NewWave servers on the network, the OMF must begin to communicate with remote servers. This requires a server-based OMF-to-OMF communication facility, which doesn't exist in the product today. There must be object identification and location mechanisms—methods for finding remote objects, activating them, establishing and maintaining live links across the network, and managing the life cycle of objects (e.g., how an object is deleted from the system). HP is still in the process of development here. It is merging its OMF with Apollo's NCS technology to achieve distributed NewWave. HP is also investigating the implementation of warm links.

The distributed NewWave concept will not be dependent upon NewWave Office. It will be designed as a general facility with applicability to other areas such as manufacturing and engineering. HP intends to license distributed NewWave when it is available.

CUSTOMIZABLE INTERFACE. To make NewWave attractive to users outside the office arena, HP intends to implement multiple conceptual models and metaphors in the Unix and OS/2 versions. The user will be able to choose the most appropriate environment in which to work: the desktop, a production line, a CAD workbench, etc.

PRESENTATION INDEPENDENCE. Requiring the developer to write to both the NewWave and the window manager APIs can be a problem for developers working on multiple operating platforms. A company whose product runs on both OS/2 and Unix must write the product not only to NewWave but also to the underlying windowing manager—Motif on Unix and PM on OS/2. This makes for extra work and limits the portability/scalability of the development effort.

HP is working with third parties to develop a layer of software that fits between the NewWave environment and the windowing manager to provide presentation independence. This would allow the developer to write only to the NewWave APIs. The additional layer of software would take care of adapting to the appropriate underlying windowing manager, making the developers' job much easier. This would go a long way to attracting third parties to the NewWave environment, a critical factor in HP's strategy.

PRESENTATION/SEMANTIC SPLIT. HP's ultimate goal is to separate the presentation or interface from the semantic objects in the environment. (A *semantic object* is one that manipulates data, such as a database manager.) In an object-oriented environment, objects communicate through messages. One object sends a message to another object: "express yourself." The object expresses itself and sends back a message to the requesting object. The objects never touch each other, an "ask, don't touch" approach. Therefore, objects do not need to know intimate details about each other and what they are or do. Each object only needs to have an understanding of how it interprets and executes standard messages.

As an object in the system, the interface would keep track of the screen layout and movements on the screen. These

> *Having the OMF capability at the server level is critically important to the next generation of NewWave Office.*

movements would be formulated into messages and then sent to the appropriate semantic object(s), which could be located on the same workstation or on a remote workstation/server. Separating the interface from other objects, such as a mail server, facilitates the existence of multiple presentation objects, each representing a different look-and-feel and/or behavior.

HP has, in fact, demonstrated this, allowing a presentation object under OS/2 and one under Unix to display a single semantic object residing on a Unix server.

WORKGROUP APPLICATIONS. HP has had much demand for calendar/scheduling capabilities within NewWave Office. It is developing an interface to the DeskManager time management function for MPE and extending OpenMail to include a scheduling capability. The front-end software would be the same for both.

Another top priority enhancement is mail-enabled applications, such as serial routing and electronic authorization. HP feels these will have a strong impact on customer demand in conjunction with X.400 and EDI capabilities. With OpenMail ported to a broad range of platforms, the customer will be able to put into place an enterprise-wide communication system with significant added value. HP sees this as an important differentiator for the company.

Conclusions

HP's stake in the ground is leadership in object-based information management and a strong emphasis on the Unix server platform. HP's significant new server products—OpenMail, ACT and AIMS—are both Unix-based, and NewWave Office for Unix is getting equal billing with MPE. HP is very serious about its push for de facto acceptance of OpenMail and NewWave as industry standards.

When you talk to HP about Fortune 500 accounts, the problem seems to be getting in the door (past the inevitable

Digital VAXs and a cacophony of IBM systems), not staying in once the presence is established. We see HP using NewWave and NewWave Office as a way to get in that door, a first step that HP hopes will quietly lead to its becoming a pervasive business environment and communications platform. Using the desktop/user as a design center may prove to be a key factor in HP's success. Giving the user easy access to enterprise-wide information and analysis/decision-making tools, while at the same time helping MIS with its control and security issues, makes for a happy customer.

It turns out that HP, like IBM and Digital, is going after the infrastructure. The difference between HP and IBM is that IBM hasn't even clearly articulated its strategy for AIX, let alone introduced products. Digital has a coherent strategy with a commitment to comparable NAS (Network Applications Support) services across VMS and Ultrix, but it hasn't yet validated the strategy with an integrated set of products. When Ken Olsen states that he doesn't consider Unix an open platform, we have to believe that sentiment filters down through the company, making the Ultrix sell all the more difficult within Digital, not to mention to the customer. And the fledgling client software for All-In-1 has a way to go before it can compete with NewWave's functionality and ease of use.

HP's solution is based on a powerful RISC/Unix platform for commercial applications; a commitment to a distributed, cooperative computing environment; an appealing desktop metaphor (ultimately customizable); interoperability between HP's proprietary, Unix, and other strategic operating systems; and a strong set of tools for integrating applications. HP is certainly poised to give both IBM and Digital a run for the money in the Unix environment. As for winning the war for the enterprise communications backbone, a lot depends on HP's implementation of distributed NewWave, support for workgroups, and the availability of a broad range of third-party tools and applications. Keep a close watch on HP. We sure will.

Industry Conferences
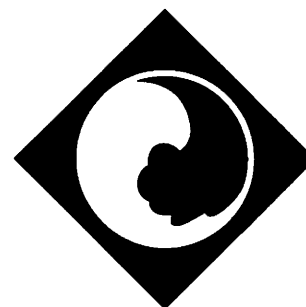
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Overview:

The theme of this year's Executive UniFo-rum Symposium is the Unix software and applications development environment. If Unix is to become a commercially viable operating system, it must be able to support, attract, and nurture the next generation of applications and development tools. Is Unix up to the task?

This conference will present the views of industry leaders, including hardware, software, and networking vendors, as well as the views of commercial users. It will also provide a forum to spotlight the next generation of Unix applications.

Who Should Attend:

• **Commercial End Users** who need to understand the role Unix will play in that marketplace.

• **Application Developers** who need to understand the latest developments and who need to network with other software and hardware developers.

• **Software and Hardware Manufacturers** who need to understand the position of the end-user and development communities and want to have the opportunity to share many points of view.

Topics to Be Addressed Include:

• What are key Unix vendors doing to ensure their success in commercial Unix?

• What will the new applications under Unix look like?

• How can Unix applications interoperate with proprietary applications?

• What are real user experiences in implementing Unix, in regard to implementation time, cost, training?

• What are potential end-user requirements and priorities in regard to transaction processing, real-time, and multiprocessing Unix system features?

• How can users move to the next generation operating systems and applications in an evolutionary way?

• What will be the role of Unix-based distributed network computing in defining the next generation of commercial data processing?

• Will OS/2 play a role in defining the importance of Unix?

• What vertical market areas and applications appear to be the leading sectors in implementing Unix?

• How are Unix markets evolving outside the United States?

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OCCA: NCR Gets Serious about Open Systems

Call it an acknowledgment of reality. NCR's new Open Cooperative Computing Architecture (OCCA) says all the right things to users who expect systems vendors to have a technology architecture describing standards-based systems with open interfaces. OCCA is the blueprint for NCR's future efforts in a variety of applications—most importantly, general office services, banking, and retail.

For NCR users, OCCA is the basis for planning the migration to open enterprise networks. For developers, it defines a development platform that masks differences between processor architectures and operating environments. For NCR, OCCA defines the direction of its future information systems products.

In announcing OCCA, NCR joins virtually every other major system vendor in announcing an open architecture supporting a common applications platform that extends across the enterprise. OCCA is most similar to the architec-

tures of Hewlett-Packard and Unisys. There are subtle differences, but those alone won't be enough to sway customers. Rather, OCCA's test will come as NCR moves to the market with real products. Those products must be uniquely well-implemented and must add unique features to the standards base described by OCCA.

NCR announced OCCA in February and revealed the NCR System Software Platform, which implements the base services of OCCA. Beginning in late spring, NCR will roll out applications-level products built on the system software platform. The first of these will be Cooperation, an open office environment based on Hewlett-Packard's NewWave applications environment and a client-server architecture. Environments for retail and banking applications will come later.

OPEN COMPUTING ARCHITECTURE. OCCA is NCR's design for distributed computing environments (DCEs), which distribute computing functions and data across enterprise networks. It is open—based on the de jure international standards but also accommodating de facto standards like Microsoft's LAN Manager and OS/2. And OCCA addresses wide area as well as local area networking. It seeks to accomplish six goals:

- Provide access to data and computing functions across the enterprise to individual desktops

- Integrate data across applications

- Support applications portability

- Protect data integrity

- Reduce duplication of effort and resources

- Accommodate continuing change in applications and technology

NCR validated its design for the future with an extensive survey of user managers, software developers, and distributors over the course of a year. The user's priorities are reflected in OCCA's goals, particularly NCR's ability to build new technologies into its framework.

OCCA'S STRUCTURE. To accommodate change, OCCA must be well thought through and be layered to segregate the impact of changes. NCR appears to have done both. OCCA has three major pieces: the structure, the interfaces, and the rules.

OCCA is structured into five layers to describe the logical components in a system. As depicted in the illustration

at right, two of the major layers have their own sublayers. What follows is a description of each OCCA structural layer and the specific plans NCR has announced with the NCR Systems Software Platform.

Human Interface. The Human Interface layer provides a consistent graphical user interface across multiple applications and operating systems. Users can, via OCCA, open windows into different sessions—host terminal emulation, Unix applications, DOS, or OS/2 applications—simultaneously.

OCCA supports three levels of interface: character-based terminals, graphical user interfaces, and object-oriented interfaces making use of object management, networking, and a variety of user metaphors. NCR is supporting MS-Windows, OS/2 Presentation Manager, and OSF Motif as its graphical user interface standards. And Hewlett-Packard's NewWave is its choice as object-oriented interface.

Application Environment. The Application Environment layer provides services for integrating existing applications and developing new ones based on open application programming interfaces (APIs). The NewWave API is included in this layer.

The OCCA Application Environment includes horizontal applications like spreadsheets and text processing, specialized vertical software, and applications development software.

Cooperative Services. The Cooperative Services layer supports the distribution of applications and information across the network. It identifies key interfaces and standard services as well as software needed to secure and manage a distributed computing environment, placing them into separate layers: Information Services, Application Services, Network Delivery Services, Support Services, and System Management Services.

The Information Services layer includes database access, full-text retrieval, document composition, image

NCR's Open Cooperative Computing Architecture
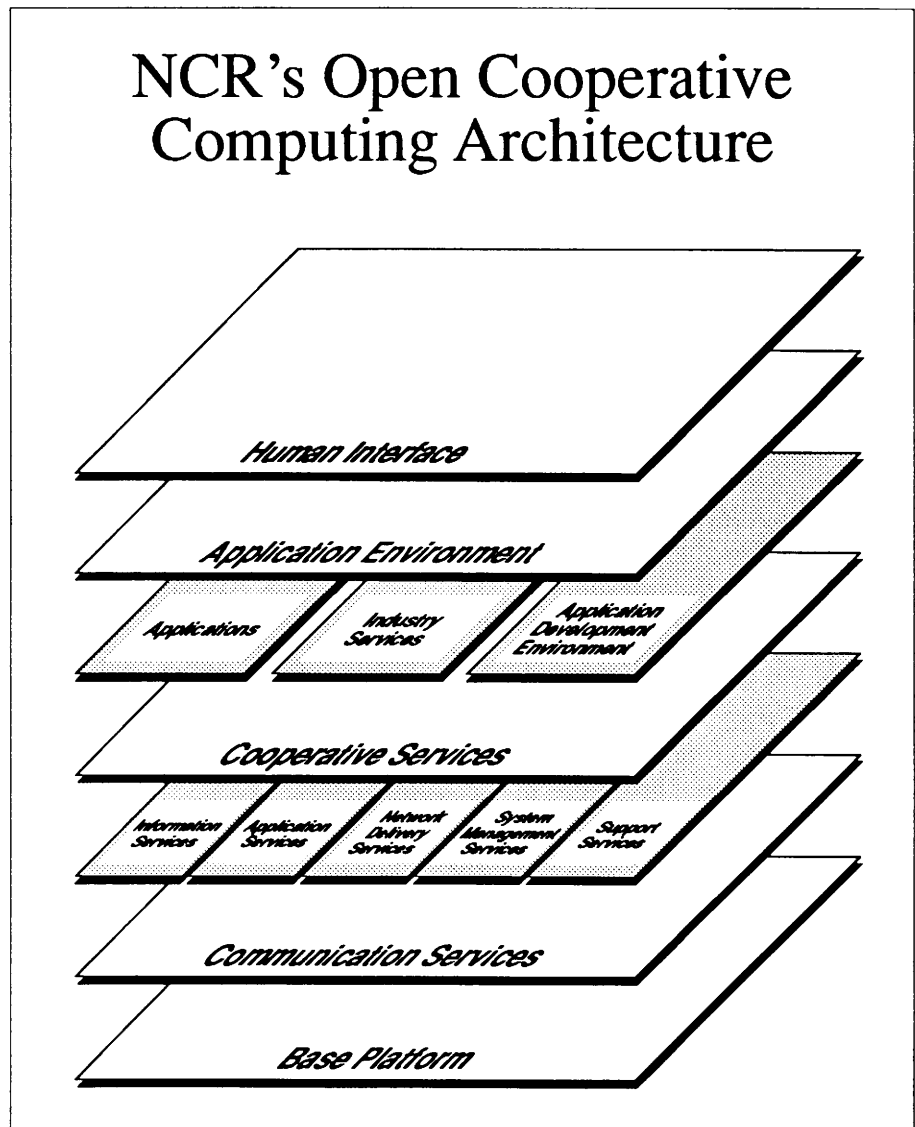
services, expert systems, compound document support, and mail. In the system software platform, NCR has identified the following standards as being currently relevant to this layer:

- SQL for database access

- The international Office Document Architecture (ODA) standard with its Office Document Interchange Format (ODIF), and the federal Standard Graphics Markup Language (SGML) and its Standard Document Interchange Format (SDIF) for compound document preparation and management

- X.400 for electronic mail

- X.500 directory services to support distributed information access

Application Services. In the Application Services layer, remote data access and workflow automation are the key components. NCR didn't address specifics in its system software platform description, but the company's interest in the software being developed by the Microelectronics and Computer Consortium (MCC) in Austin, Texas, is well known.

Network Delivery Services. The Network Delivery Services layer provides mail gateways to X.400, electronic data interchange (X.12 and EDIFACT), fax, terminal emulation, file transfer serv-

ices (ISO FTAM), and virtual terminal service (ISO VTS). NCR also includes object distribution in this layer, referring to its participation in distributed object management standards definition by the Object Management Group, an industry consortium.

System Management Services. The System Management Services layer describes a hierarchical structure of management capabilities, starting at client-specific services and extending to entire WANs. In the system software platform, NCR identified the ISO Common Management Information Service (CMIS) network management standard as being relevant to this layer.

Communication Services. The base communication services required to move data into LANs and WANs are found at the Communication Services layer of OCCA. NCR will support LAN Manager and LAN Manager for Unix, NetBIOS, TCP/IP, IBM's Common Programming Interface-Communications (CPI-C), IBM's Advanced Program-to-Program Communications (APPC), 3270 API and Entry Emulator High-Level Application Programming Interface (EEHLLAPI), AT&T's Transport Level Interface (TLI), and X.25 and other OSI standards.

Base Platforms. For NCR, the Base platforms includes processor architectures as well as operating system software. OCCA supports the Intel and Motorola standard processor platforms, including RISC processors. Server operating systems include Unix and OS/2, with DOS being added as a client operating system.

THE INTERFACES. The Interfaces of the OCCA model include the interfaces that will link different components in an OCCA implementation. NCR has identified many interfaces, most of which are listed above. The important point is that there are lots of them, and not all of the interfaces are based on de jure standards. NCR recognizes pro-

prietary standards, particularly from the IBM world, as well.

THE RULES. The Rules of the OCCA model define the conventions and rules governing the use of the other sections. NCR has placed within this layer the style guide that basically unites the use of Windows, Presentation Manager, and Motif, even though they are based on different operating systems.

TARGETING THE OFFICE. NCR's first major marketing effort with OCCA is Cooperation, an office-product suite NCR is promising for the third or fourth quarter of 1990. Details are sketchy, but we do know that Cooperation will be shipped atop the NCR System Software Platform and that it will use NewWave as its high-level interface. We assume that NCR will build mail into Cooperation.

The fact that it is based on NewWave assures that Cooperation will come with a fairly healthy complement of applications. A dozen or so applications have been written to NewWave's interface to date, but NewWave accommodates most DOS applications by encapsulating them for inclusion in its environment. We expect NCR's primary value-add in the first release of Cooperation to be tools allowing users to access information in a variety of environments from within the NewWave environment.

OTHER TARGET MARKETS. After Cooperation, NCR will target its retail and banking customers with OCCA-based products. These products will be specialized applications and services; the basic platform and application environment can be tailored to specific industry requirements.

Many of NCR's banking and retail customers already use cash registers, check sorters, and related equipment based on PCs and standard networking, but they haven't yet been introduced to graphical user interface, enterprise information access, and integration of information from a variety of sources.

NCR is betting that, as these customers upgrade to take advantage of new technologies, they'll choose OCCA. The company expects the upgrades alone to generate substantial revenue, and new applications to keep revenues growing for many years.

MIGRATION TO OPEN SYSTEMS. NCR has been selling Unix systems for a decade, so it doesn't have the huge base of proprietary equipment to protect that vendors like Unisys have. The number of customers using NCR's ITX (interactive) and VRX (batch transaction oriented) mainframes has been diminishing for some time. NCR keeps enhancing the two lines, but, at the same time, it has been building migration paths for ITX and VRX to standards-based networks.

Currently, ITX and VRX systems can participate in SNA and X.25 networks, and both support X.400 mail. NCR also has a channel-connect product for VRX called Union, which allows a VRX system to use the interfaces and networking services of an attached NCR Tower Unix box. NCR doesn't offer a Unix connection for its ITX customers, but we expect NCR to close that gap this year.

CONCLUSION. At first glance, NCR's market-research program to validate its OCCA plan is a puzzlement. Why did NCR have to spend so much time and effort to "discover" the obvious trends in the industry? The answer to that question, we believe, was to make its new strategy convincing to a big company that has never had such a plan to work with. NCR sales reps have always sold products; now they're being asked to sell a strategy in advance of the products. This is a difficult transition, and NCR's investment in its market research should help.

OCCA pushes all the right buttons. We particularly like its emphasis on coping with changes in technology and user requirements. This point has led NCR to include object-oriented environments, networking, and databases

within its strategic framework, something only a few other vendors have done to date.

OCCA demonstrates that NCR understands all of the dimensions of the problem. During the next year, we'll see how well the company understands how to make it happen.   — *J. Rymer*

•UNIPLEX•

Benefits from the HP Alliance

In our feature article, we discuss the implications of HP's positioning Open-Mail as an industry standard mail server (see page 14). But the focus was on what it buys for HP. Let's look at the other side of the agreement and see what Uniplex gets out of the deal.

EASY MONEY. There's easy money to be made in porting products...if you have the team in place to do so. Uniplex has prided itself on its porting abilities and, indeed, has ported its integrated office system to over 220 Unix platforms. Porting is the grunt work of software development. Uniplex is happy to supply experienced grunts (no offense intended) for a reasonable fee. HP gets OpenMail on virtually every Unix platform, and Uniplex stands to get a large paycheck.

X.400. Uniplex will be substituting OpenMail, a native X.400 mail server, for its older generation, nonstandard server. With no muss, no fuss, and no development costs, Uniplex can offer its customers industry-standard mail.

A NEW PRODUCT TO SELL. While OpenMail will be ported to all Uniplex platforms as part of the Uniplex product, 20 or more of the most strategic ports, including AIX and Ultrix, will also be independent of the integrated office systems. HP has given Uniplex the authority to sell OpenMail without Uniplex to customers. This gives Uni-

plex, the company, a much-needed second product line. Integrated office systems are becoming passé—though Uniplex will still be strong for several years simply by virtue of being the most popular placeholder until the new generation of Unix office applications becomes ready for market. Selling OpenMail will be a learning experience for the marketers and sales force at Uniplex corporate.

HP'S BLESSING AND SALES. Finally, Uniplex should benefit greatly from its placeholder position in the HP office strategy. While NewWave Office is the strategic environment for client/server installations, HP will market Uniplex as its traditional host/terminal office solution. HP's endorsement can't but help Uniplex sales.   — *R. Marshak*

•UNIWARE•

Extra! Extra! Added Security

It's hard to talk about the potential of distributed network computing without also pointing out its current shortcomings—among the most notable, security (or rather, its absence). We do, however, stumble across security technology now and again. There seems, for instance, to be a good deal of interest in the Kerberos authentication system (developed at Project Athena), especially since the De Corum submission to OSF's Distributed Computing Environment (DCE) Request for Technology (RFT). But lesser-known solutions are available as well. One comes in a product called UniDesk from UniWare Computer (Berlin, West Germany).

We should point out that UniDesk isn't a security system. UniWare marketing literature refers to it as "intelligent organization software." Somewhat cryptic, no? Essentially, UniDesk is a desktop manager. Currently, the product has its own character-based user interface, but it's being adapted to sup-

port both OSF Motif and Macintosh. The desktop contains a mailbox, wastebasket, registry services, document retrieval, and security services, as well as personal tools—a calculator, notebook, and calendar. Upon this shell, you can integrate applications specific to your needs.

However, UniDesk is a deeper product than your typical Unix desktop manager (à la X.desktop and Looking Glass). First of all, UniDesk's client/server architecture is designed for networked environments. Furthermore, UniDesk treats documents as objects. The system doesn't address the structure or contents of a particular document; it only knows that it can be manipulated by a certain editor (or application). Therefore, when you call up a document, you receive both the document and its editor. UniDesk also supports networked object-sharing. Workgroups can share objects among group members as well as with other users on the network. The system has an object manager that links data and applications together, tracks objects, and maintains concurrency control.

SERVER ARCHITECTURE. Transparent object-sharing is key to the effective use of an object-oriented environment. In developing such a system, UniWare came up with a server architecture (see illustration) noteworthy for its security system.

Along with the desk and mail services we've mentioned, UniDesk provides a configuration and registry server. An interface module—called COSI (Common Service Interface)—glues all the servers together. COSI needs to be installed at each workstation; servers can be centrally located.

The desk server actually does more than just provide the desktop services we've already pointed out. It acts as a user agent, storing objects for each user and determining user access, as well as providing for the editing of object profiles. Also accessible from the desktop is the mail server, which supports the X.400 protocol as well as most commercial LANs.
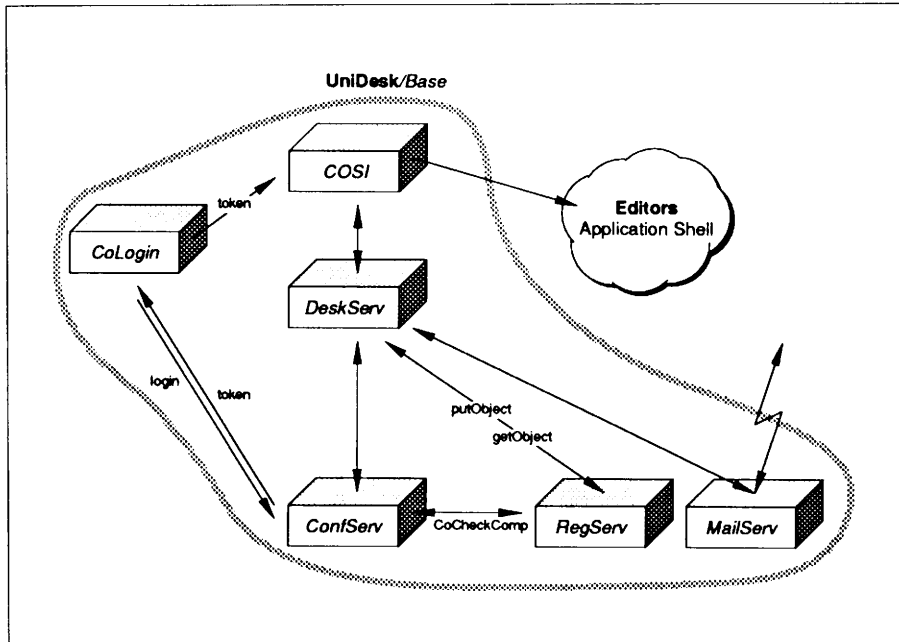
UniDesk is a server-based system for networked environments. All servers must be accessed through COSI, UniDesk's user-interface module.

The registry server maintains object attribute profiles and retrieves objects. "Object attribute profile," in this case, is not much more than a trendy phrase for "document summary." It contains things like date and time, author, the date of last revision, document title, keywords, etc. In addition, however, it knows which application editor was used in creating the document and where it resides on the network. The object itself and its attributes are stored independently, and they are brought together during the retrieval process. The registry works in conjunction with file locks to make sure that two people aren't working on the same document simultaneously.

Extended Security. UniDesk doesn't merely rely on the application or the generic Unix user identification system for security. Over and above these conventions, UniWare has developed a configuration server designed specifically for distributed computing security. UniWare has targeted two security requirements: authorization control and authentication control. Authorization sets permissions and levels of system use; authentication guarantees that

those permissions are not misused.

Starting with the assumption that most organizations have a hierarchical structure, UniDesk developed a hierarchical authorization structure. Workgroup leaders or administrators, for example, can control which group members have access to certain objects (or sections of objects) and what they can do with those objects (or sections). The system allows system access to be assigned by user (or workstation, if workstations are shared, as is often the case) or by subject. Therefore, users may have different levels of access depending on what they're working on.

UniDesk addresses authentication with the concept of a token. It's actually very similar to Kerberos. When you log in, the configuration server passes you an identification token, which gives you access to the system for a session. The system only recognizes you by your token—not your password—and, since the configuration server resides locally, no passwords are ever found on the network.

CONCLUSION. UniDesk's security makes it an interesting product. By providing authorization and authentication

services, UniWare has hit the proverbial nail squarely on the head. Although vendors have dealt successfully with access control for applications in homogeneous environments, it clearly becomes a more significant and complex problem in heterogeneous, networked environments. You can't just rely on the access rights of an application any more. As distributed computing proliferates, the scope of the problem will become more apparent, and network managers will need the flexibility and depth offered in a solution like UniWare's. Likewise, authentication is necessary in a distributed environment, where a workstation cannot be trusted to correctly identify itself or its users to shared network services.

However, it's hard to determine the commercial viability of UniWare's offering. Not only has Kerberos been getting a lot of attention (although Kerberos is only an authentication system, while UniWare's configuration server also attends to authorization), but the OSF DCE selection is coming up. And, whether or not OSF's recommendation includes it, Kerberos may provide the standard foundation for security implementations in the future.   —*L. Brown*

• A P P L E •

Is a New Release Enough for A/UX?

Apple finally came out with a release of A/UX that it should have brought to market in the first place—one that exploits both the power of Unix and the ease of the Macintosh. Among the new features of Release 2.0:

*   The traditional Mac user interface

*   Access to Unix shell windows from within the user interface

*   A/UX Finder (a Unix version of the Mac Multifinder product)

- Access to Macintosh graphics capabilities (including support for 32-bit QuickDraw graphics)

- A mouse-driven shell editor

- A Unix command builder

- Improved support for the X Window system

POOR TIMING. When A/UX was first announced two years ago, we were excited about a Mac-looking Unix. But the product was disappointing. Not only was the Release 1.0 operating system slow, buggy, and crash-prone, but the interface was mean. So was the interface of Release 1.1 (January 1989). Meanwhile, Motif has come along and just about cornered the Unix graphical user interface market. Clearly, Apple's late arrival won't help its success.

Furthermore, Release 2.0 has come on the heels of the much-publicized an-

nouncement of Apple's loss of the previously won $168 million Air Force contract. The loss was a big blow to Apple's A/UX-ers. Apple was to supply anywhere from 10,000 to 80,000 Mac II-based A/UX workstations for the World Wide Military Command and Control Station, and, at the time, the company felt somewhat relieved of the bad first impression it made in the Unix market. (Apple lost the contract, incidentally, because the workstations weren't multitasking. You had to leave the multitasking Unix environment to get Macintosh functionality.) About the same time as the contract loss, Apple was in the news again: first, announcing a three percent staff layoff; and again, as it shook up its upper management, resulting in the resignation of Senior Vice President and Chief Technical Officer Jean-Louis Gassée.

THE PROOF IS IN THE PUDDING. However, Apple's recent woes have

nothing to do with the quality of A/UX Release 2.0. Actually, Release 1.1 made great strides from the developer's perspective—the most notable being the integration of the Macintosh Toolbox, a set of development resources for programmers to create applications that run in both the Mac and A/UX environments. In addition came support for some industry standards (X Window, Posix, and NFS), BSD 4.3 extensions, and color support. What with the Macintosh interface, access to advanced graphics, and the features included in Release 1.1, this version of the operating system looks promising. However, we won't know for sure until developers and users tinker with it. We only hope that Apple didn't wait too long in delivering its original conception of a Macintoshed Unix.

—L. Brown

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