Patricia Seybold Group

Editor-in-Chief
Michael A. Goulde

INSIDE

OPEN INFORMATION SYSTEMS

Guide to Unix and Other Open Systems

Vol. 8, No. 1 • ISSN: 1058-4161 • January 1993

X/Open in the 1990s

Making Open Systems Safe for Users?

By Stanley H. Dolberg

IN BRIEF: X/Open has been a focal point for open systems standardization efforts for over eight years. From its beginnings as a European vendor club, X/Open has grown in size and diversity of membership, and the X/Open brand has become an increasingly important factor in government and commercial RFPs. But the market is changing rapidly, and pressure is building on X/Open to bring forth ever more complex standards in less time. As Windows NT threatens the Unix franchise, X/Open could become an effective venue to bring the Unix splinters together in a unified enterprise computing framework. This article on X/Open is the first of a two-part series on X/Open and XPG4. See the next issue of *Open Information Systems* for details on XPG4.

Report begins on page 3.

Looking Ahead to 1993

A Year of Events You Never Anticipated?

EVEN BEFORE THE announcement of Novell's acquisition of Unix Systems Laboratory from AT&T, we knew that 1993 would bring shipments of technologies that might change the face of the industry, including:

- Microsoft's Windows NT
- Intel's Pentium microprocessor
- IBM and Motorola's PowerPC processor
- SunSoft's Solaris for Intel PCs
- NeXT Computer's NextStep for Intel PCs
- Lotus Notes 3.0 for Unix servers and clients and for Macintosh clients
- Apple's Newton Personal Digital Assistant

In addition, distributed applications based on the Open Software Foundation's Distributing Computing Environment (OSF's DCE) will go into production, lending needed credibility to the OSF.

These events signal major milestones in the evolution of the industry, and 1993 is shaping up as a year of restructuring and realignment. Novell's acquisition of USL may only be the first in a series of transactions that ultimately lead to a major shift in the control and direction of the industry. Readers should not be surprised during 1993 if they hear news that:

- Microsoft is acquiring a major system vendor. In the past, Microsoft had acquired small software companies with products that complemented its product line. Now, however, as Microsoft's mission expands to becoming an enterprise solution provider, the company needs to expand its distribution beyond traditional PC channels and into the upper reaches of MIS. It has no significant presence there currently, and what presence it has had has generally been ineffectual. By acquiring a major system vendor, Microsoft could gain a strong, well-managed presence with those customers who make the strategic decisions for the enterprise.

- IBM acknowledges that it is giving up on SAA and migrating to XPG as its framework for interoperability among all its systems. SAA was designed to integrate heterogeneous architectures, providing a common applications environment across them, much the same as XPG provides for open systems. If IBM had done what Unisys did—use open systems interfaces to tie heterogeneous systems together—instead of using proprietary interfaces, then maybe it wouldn't be in the difficulty it finds itself in today. And a switch by IBM to a single architecture, Power RISC Architecture, for all of its systems would make SAA completely irrelevant.

- Hewlett-Packard acquires NeXT Computers, making NextStep its strategic development environment for distributed object applications. Not that HP needs another hardware platform—certainly not another Motorola-based one—but having control over the future of NextStep would give HP leverage in an area where its NewWave didn't. Few in the industry dispute that NextStep accomplishes today what Taligent, Microsoft, and others are aiming for by 1995. (If HP were to acquire NeXT and then jettison Steve Jobs, it would be the second time the Apple co-founder left HP.)

Even if these specific events do not occur, vendors will be reevaluating strategies that have been central to their approach to the market for years as they try to respond to the changing environment. Sacred cows will be slaughtered, and enemies will become friends. The face of the industry will be very different on January 1, 1994.

The coming year will be challenging and confusing for vendors and users alike. It is our intention to provide analysis and insight in *Open Information Systems* that will help our readers to make informed decisions for their organizations during this period of turmoil and change. ◐

OPEN INFORMATION SYSTEMS

Editor-in-Chief
Michael A. Goulde

MCI:
MGoulde
Internet:
mgoulde@mcimail.com

Publisher
PATRICIA B. SEYBOLD

Analysts and Editors
JUDITH R. DAVIS
STANLEY H. DOLBERG
DAVID S. MARSHAK
RONNI T. MARSHAK
JOHN R. RYMER
ANDREW D. WOLFE, JR.

News Editor
DAVID S. MARSHAK

Art Director
LAURINDA P. O'CONNOR

Sales Director
PHYLLIS GUILIANO

Circulation Manager
DEBORAH A. HAY

Customer Service Manager
DONALD K. BAILLARGEON

Patricia Seybold Group
148 State Street, 7th Floor,
Boston, Massachusetts 02109

Telephone: (617) 742-5200 or
(800) 826-2424
Fax: (617) 742-1028
MCI: PSOCG
Internet: psocg@mcimail.com
TELEX: 6503122583

Open Information Systems (ISSN 0890-4685) is published monthly for $495 (US), $507 (Canada), and $519 (Foreign) per year by Patricia Seybold Group, 148 State Street, 7th Floor, Boston, MA 02109. Second-class postage permit at Boston, MA and additional mailing offices.

POSTMASTER: Send address changes to *Open Information Systems*, 148 State Street, 7th Floor, Boston, MA 02109.

X/Open in the 1990s

Making Open Systems Safe for Users?

(This is part one of a two-part series. Part two, "XPG4: Light in the Open Systems Tunnel ?" will appear next month.)

X/Open: An Organization in Transition

On the Road from Club to Industry Catalyst

X/Open is probably the single most effective point of leverage users have for influencing the form and speed of open systems evolution. By participating in X/Open activities and by lending credence to its activities through specification of XPG compliance in Requests For Proposals (RFPs), important user organizations have validated X/Open as the focal point of vendor- independent open systems.

X/Open has seen the future, and it is standards. X/Open wants to play a vital role in shaping the road to that future and is working hard to leave behind the polite clubbiness of the past to play a key role across a broad range of standardization-related activities. But X/Open faces a difficult environment. Margin-squeezed vendors are increasingly demanding that nonprofit organizations demonstrate commercial value, and users have become smarter and increasingly activist. The open systems franchise faces the test of the millenium in the form of Microsoft and Windows NT. The U.S. government and the European market conflict with the U.S. commercial markets on the importance of Open Systems Interconnect (OSI). X/Open is being pushed to broaden its agenda to account for the productivity of other standards organizations and, at the same time, increase its own production of verification tests for a greater array of products. Despite this chaotic situation, X/Open is growing in size and, particularly with users, in importance. X/Open could become a key factor in assuring large commercial users that open systems offers a real alternative to vendor domination by bringing the Unix factions together on high ground with a unified enterprise computing framework.

Snapshot: The X/Open Organization

The X/Open Company, Limited, operates facilities worldwide, with headquarters in Reading, England. Corporate managers responsible for technology, field operations, marketing, finance, publishing, and legal matters all report to the chief executive, who, in turn, reports to the board of directors. The 20-member X/Open board of directors consists of the 16 system vendors shareholders; the 3 chairpersons of the User, ISV, and System Vendor Councils; and the chief executive officer.

The annual budget for X/Open currently runs about $12 million, which covers the facilities and employment of 55 people in four locations worldwide. Besides the U.K. headquarters, there are two locations in the United States and a fourth in Tokyo. Vendor and user "volunteers," most of whom commit in excess of 30 percent of their time to X/Open, swell the working ranks to over 350 people. Most of the volunteers work on technical specifications, though some focus on marketing.

X/Open History and Philosophy: Pragmatism in Pursuit of Consensus

X/Open formed in 1984 as a group of European-based system vendors trying to level the playing field with the IBM juggernaut that was threatening to dominate the European market (see *Open Information Systems*, Vol. 7, No. 11, November 1992, for more background). X/Open formally became the X/Open Company, Limited in 1987, with an international array of system vendors as the initial members and shareholders. Since its founding, the mission statement for X/Open has been, "To bring greater value to users from computing through the

practical implementation of open systems." The emphasis on pragmatism at X/Open has been a primary source of vigor for the organization, since it has pioneered a consensus process involving vendors and users that could have sunk under the weight of its controversy. For example, X/Open efficiently adopts commercial de facto standards such as the Informix C-ISAM file management technology or Sun's Network File System (NFS) in order to focus its efforts on more difficult issues transport-independent networking or vendor-neutral SQL, for example. At the same time, X/Open's pragmatism has attracted criticism from open systems activists who see X/Open as mired in politics, lacking direction, and unable to "do the right thing," such as settle the graphical user interface (GUI) look-and-feel wars.

The Growth of X/Open Speaks Loudly

X/Open membership has grown in size and diversity. The organization has taken a core set of concrete deliverables—XPG, Xtra user requirements, verification tests, and branding—and has consistently come through on them in ever-widening scope. And X/Open enjoys the robust and growing participation of high-impact users in its requirements process. With the launch of XPG4, X/Open hopes to open a new chapter in the open systems saga in which users and vendors together steer open systems into the mainstream of the marketplace.

Vendor Dominance Yields to Vendor/User Balance

Since 1989, the ranks of the shareholder members have thinned from 21 to 16, due to consolidation in the industry or, in the case of the Open Software Foundation (OSF), due to funding priorities. Even with fewer shareholders, the composition of the board of directors spells vendor domination, though, according to users, the X/Open board operates on a principle of balance of power and does not actively rely on the numerical majority. Most of the parties agree that the vendors, who each pay in about $650,000 yearly, should have final say on the adoption of technical specifications that could cost them dearly in R&D investment.

User Ascendance at X/Open

Recently, users have been empowered by the X/Open board in substantive ways. For example, in 1992, the User Council received control of the entire requirements process. The User Council planned and executed the 1992 Xtra Survey, which, unlike its user requirement focus of past years, focused on vendor open systems product plans. In addition, a significant process change has created requirements workgroups comprising only users. The requirements workgroups operate at peer-level with the corresponding vendor-staffed technical workgroups, to ensure that component specifications meet real market needs. User organization memberships in X/Open have grown in recent years, and the active presence of system integrators has begun to transform the workings of X/Open. (See Table 1.)

The Evolving Business Model for X/Open

The business model for X/Open is moving away from the original model of a group of vendor shareholders supporting operations by paying large annual membership dues. The new revenue model supplements shrinking shareholder dues with a diverse mix of sources for revenue growth. While shareholders will continue to pay hefty membership dues, the combined revenue from memberships; participation fees from user organizations, independent software vendors, and smaller system vendors; and most importantly, a substantial growth oppportunity in trademark license dues, branding royalties, and publication sales are expected to increase from the current 20 percent of the budget to eclipse the shareholder contribution within the next five years.

The Rising Tide of Open Systems Will Boost Revenues

The key to meeting this growth expectation will be the growing number of open systems procurements that specify X/Open branding as a requirement. X/Open calculates that $7 billion in current procurements have referenced XPG specifications. The downstream growth in shipments of branded product should create a rising tide of royalty fees, directly connecting an increasing percentage of X/Open revenue with the value in the marketplace of the X/Open brand.

The X/Open Membership Roster: Fall 1992

Corporate Members	User Council		ISV Council
Amdahl Corporation	Andersen Consulting	Migros-Genossenschafts-Bund	ASE Consulting Ltd
Campagnie des Machines Bull	Bell Communications Rsrch	Ministerie van Financin	ASCII Corp.
Digital Equipment Corp.	Booz Allen & Hamilton, Inc.	National Institute of Standards and Technology	Boldon James Ltd
Fujitsu Ltd.	British Telecom	Nestec SA (Nestle)	Computer Associates Int'l
Hewlett-Packard	Bundesamt fr. Informatik	NHS Information Mgmt Center	Computer Power Group Ltd
Hitachi Ltd.	CCTA	Nippon Telegraph & Telephone Corp.	Gresham Telecomputing plc
IBM Corp.	Commission of the European Communities	PRC Inc.	Informix Software, Inc
ICL	Computer Sciences Corp.	Prime Minister's Office, Hungary	Ingres Corp.
NCR Corp.	Credit Lyonnais-France	Swedish Police	Liant Software Corp.
NEC Corp.	Daimler-Benz AG	Shell Internationale Petroleum	Micro Focus
Ing C Olivetti & Co, SpA	Dept. of Social Security	SITA	Microsoft Corp.
Oki Electric Ltd.	DHL Systems, Inc.	Statskontoret	Mimer Software AB
Siemens Nixdorf	E I DuPont de Nemours & Co.	STET	Mortice Kern Systems
Sun Microsystems, Inc.	Eastman-Kodak	Sweden Post	Netwise
Unisys Corporation	Electronic Data Systems	Swedish Telecom	Novell, Inc.
Unix International	Elf Aquitaine	SWIFT	Oracle Corp.
System Vendor Council	Ericsson	Telefonica	Progress Software
ATM Computer	ETIS	Texaco, Inc.	Quadratron Systems, Inc.
COMPAREX	Exxon Exploration Co.	The Boeing Co.	Raxco Inc.
Diab Data	Ford Motor Co.	The Inland Revenue	Retix
HaL Computer Systems, Inc.	GTE Telephone Operations	Unilever plc	Software AG
Omron Corp.	Guide International	Union Bank of Switzerland	Sybase Inc.
Sequent Computer Systems	Harris Corp.	U.S. Dept. of Agriculture	Tecsiel-IRI Finsiel
Sequoia Systems	Innenministerium des Landes	U.S. Dept. of Defense	The Santa Cruz Operation
Sony Corp.	Nordrhein-Westfalen	U.S. Dept. of Treasury	Unify Corp.
Stratus Computer, Inc.	KPMG Mgmt Consulting	U.S. Naval Computer Telecommunications Command	Uniplex Ltd.
Tandem Computer, Inc.	McDonnell Douglas Corp.		

Table 1. X/Open membership as of October 1992. Users are gradually expanding the rank.

Positioning X/Open

X/Open as Standards Integrator

As the open systems agenda broadens, X/Open is working hard to shift itself away from being the source of all standards specifications to the position of open systems "standards integrator." Instead of battling with the many existing and emerging special interest groups in the industry, X/Open seeks to leverage its own and others' work into a coherent body of standards in order to avoid the negative effects of redundancy and conflict on the open systems market.

Positioning X/Open

The (In)visible Hand of X/Open

Just as total reliance on market forces does not always produce the free and open exchange environment envisioned by economic philosophers, so, too, complete reliance on market forces to usher in the age of open systems has its limitations. X/Open has effectively worked behind the scenes to deliver standards in more complete form, more quickly, or more broadly than natural market forces could.

Strategic Alliances with Special Interests

For example, X/Open has established strategic alliances with the Object Management Group (OMG) and the SQL Access Group (SAG), which lead efforts to standardize those relatively narrow but critically important technology areas. (See "The SQL Standard," *Unix in the Office,* Vol. 6 No. 11, for a discussion of the role of X/Open with SAG.) As standards integrator, X/Open offers OMG and SAG a set of services including coordinating among relevant standards groups, controlling consistency, disseminating draft and final specifications to vendors and relevant users, securing the approval of the X/Open board, and marketing the accepted work of its strategic partners through its organization. X/Open leverages its infrastructure to absorb overhead that would otherwise be shouldered by each group individually, and, in return, ensures for its own constituency that these important technologies will evolve in a manner consistent with its framework for open systems, the Common Applications Environment (CAE).

In the case of OMG, X/Open has committed to developing test suites for the verification and branding of implementations of the Common Object Request Broker Architecture (CORBA) as part of its work on distributed computing and system management. X/Open had a shot at the CORBA specification at the same time it went out for comment within OMG, and X/Open is working hard to make sure a single model for managed objects is established in the CAE object management and system management areas.

Standards Integrator Track Record

X/Open played an important role as standards integrator in bringing the X.400 and X.500 work to fruition. By effectively collaborating with the OSI working groups and shepherding the specifications through the IEEE, X/Open moved the rate of progress from glacial to acceptable. In such situations, X/Open offers developers a valuable perspective on how a narrow effort fits into the larger open systems framework, or how technical work from one committee could be applied to the work of another committee to bring specifications and standards to the market more quickly.

Standards Integration Glues the Splinters Together

Unix vendors face a formidable monolithic threat in the form of Microsoft and Windows NT. X/Open hopes to leverage its role as standards integrator to put more than a pretty face on a messy situation. By providing umbrella-level standards integration, X/Open hopes to play the critical vendor-neutral role needed to present the open systems route as a real alternative to vendor-controlled specifications.

Making the World Safe for de Facto Standards

The appeal of de facto standards is that they are "real standards"—standards real people have paid good money to implement. However, de facto standards present problems for users and application developers because they are subject to change at the whim of the inventor. Enter X/Open. The role of X/Open in accepting responsibility for CPI-C, NFS, LAN Manager, or any other de facto standard is far more significant than it appears. In the final analysis, such standards become frozen as baseline X/Open specifications, which then evolve through the X/Open process. This means that the de facto standard is no longer under the direct control of the inventing vendor, which is exactly what users want. Of course, IBM, Sun, or Microsoft can build a successor product or specification with new features, but the X/Open specification remains a stationary target for procurement. The most interesting example of X/Open in this role is currently unfolding with OSF's Distributed Computing Environment (DCE), which will become part of the XPG4 Distributed Computing Profile.

Users and X/Open

Breaking through the Gridlock

X/Open has suffered at times from finger-pointing by both vendors and users. Users have puzzled over how to motivate vendors to build and brand products, while vendors complain that user requirements are not "real world." Activist users within X/Open plan to eradicate this tail-chasing by working hand-in-hand with vendors through requirements workgroups associated with the technical workgroups, and by tuning up the Xtra requirements definition process. The chicken/egg problem here stems on the one hand from the high-stakes gamble open systems poses to vendors, and, on the other hand, from the often ill-defined requirements that have been generated within X/Open. By committing time and resources to the new requirements workgroups, activist users hope to more clearly illustrate the market need for specific standards and to enable vendors to extrapolate real market segments from the needs of high-involvement users. If the vendors can discern a clear business case around X/Open components or profiles, they will, it is hoped, more readily commit resources to implement product.

Users Search for the Leverage Point

Large user organizations become involved with user groups in order to influence the technology and business directions of their vendors of core technologies, such as computer systems and strategic enableware like OLTP and databases. But users who have committed to open systems need a higher-level leverage point than that provided by their principal vendors in order to move the entire supply side to where it needs to be for users to get what they want from open systems. X/Open hopes to position itself at that leverage point for users.

1992—Watershed Year for Users in X/Open?

Although the wheel has turned, 1992 does not amount to a watershed year for users at X/Open. The 1991 breakthrough of placing the User Council chair on the board still only gives users one vote in 20. In 1992, users gained control over the Xtra requirements definition process. While this signifies that the system vendors are turning additional clout over to users, with the additional power comes additional responsibility—responsibility for paying a greater share of the expenses and for an increased share of the volunteer resources required in the X/Open operation. This shift in responsibility seems quite logical since the open systems movement is about empowering users to be able to buy interoperable computer systems without the millstone of vendor dependence.

X/Open Has Attracted Users, but Can It Retain Them?

Today, X/Open owns the franchise for user involvement in the process of making open systems a reality. But it is not a franchise in perpetuity across all user segments. While government organizations may bring a long-term perspective to the workings of X/Open, commercial users come from organizations which must report quarterly earnings to stockholders who expect tangible results over a shorter term. Over the next year, X/Open will have to bring its results cycle more in line with the expectations of commercial users. The longer-term vitality and viability of the organization depends on the increasingly broad involvement from the commercial market.

The CAE and the XPG: The Ethereal and the Concrete

Open Systems as Defined by X/Open

The term *open systems* has become so widely used in vendor marketing literature that it is difficult to define crisply. X/Open operates under a broad, carefully worded definition which can include both de facto and de jure standards, but which also considers the role of ready availability of products to the user: "An open system is a vendor-independent computer environment consisting of commonly available products which have been designed and implemented in accordance with accepted industry standards." Under this definition, X/Open has been able to build a more-or-less coherent structure of open systems specifications which run the gamut from "designed by committee" standards, such as the X.400 mail protocol, to specifications popularized by a single vendor, such as IBM's Common Program-

The CAE and the XPG: The Ethereal and the Concrete

ming Interface for Communications (CPI-C), designed to interoperate with proprietary mainframe systems implementing IBM's SNA LU6.2 protocol for data communications.

The X/Open Common Applications Environment (CAE)

The overarching conceptual guide to where X/Open is going with XPG4 and beyond is the X/Open Common Applications Environment (CAE). (See Illustration 1 for a diagram of the CAE.) It is important to note that the CAE is not an architecture. CAE provides a framework within which X/Open defines the critical areas of functionality within the system and network environment, such as data management or security, for which standards must be specified, managed, and integrated in order to enable users to acquire and build open systems. Unlike an architecture, CAE neither describes nor prescribes the roles or relationships of these critical areas in an information system. Although X/Open does not maintain a system architecture, it does apply a rigorous methodology to defining and specifying the functionality required to enable a technology area to be translated into products.

Fighting the Forces of Entropy

Of course, the X/Open CAE is not the only framework in town. And, while X/Open works on many fronts to offer value, its house of standards could topple if the forces of entropy in the open systems segment were allowed to operate unfettered. Unix International (UI) offers the UI-Atlas framework; several system vendors have articulated frameworks or architectures of their own for open systems; and some large users, such as Nippon Telephone and Telegraph (NTT), and industry/user advocacy groups, such as the Petrotechnical Open Systems Corporation (POSC), have proposed still other frameworks or narrowly-focused architectures for open enterprise computing. The good news for users is that most of the frameworks pretty much agree on what pieces are needed. The bad news is that "framework fragmentation" does present a real threat to the consensus crafted by X/Open. X/Open has no choice but to try to incorporate these "contributions," wanted or unwanted, in order to retain its franchise.

The Architecture Challenge

The 1991 Xtra survey documented a user need that has bedeviled the industry—an industry- and vendor-independent architecture for open systems. Users want an architecture, but practicality dictates against being able to define a generic technical system architecture that would have any meaning to real users. An architecture relevant to DHL would be useless to Exxon Exploration or the Department of Defense, but all three are organizations involved in the X/Open User Council. Back in the real world of installed systems and corporate commitments to one or another networking scheme, X/Open has wrestled with this issue and has determined that the best it can do is offer a "technical taxonomy"—the CAE. It is important to note that X/Open is not allergic to archictectures. While it sees no value in developing a generic system architecture, architectural work certainly does go on in X/Open in the emerging areas of system management, object management, and OLTP, where a meaningful technical architecture can be described because of the relatively narrow technological frame and a fairly clean slate.

The Relationship of the CAE and XPG

Where the CAE provides the big picture, the XPG instances its concepts with detailed, implementable interface specifications for XPG components that implement specific functionality within each of the CAE technology areas. This dichotomy comes with the bargain of open systems as the concept evolves from being an aspect of engineering to becoming a genuine alternative for enterprise computing.

The X/Open CAE and the XPG: Technical Overview

XPG: The Series

The first X/Open Portability Guide, XPG1, was published in 1985, before open systems emerged as a major force in the market. XPG1 (1985), XPG2 (1987), and XPG3 (1989) focused on source code applications, portability issues related to basic operating system interfaces, commands, utilities, third-generation languages, file/data management, and rudimentary networking. For almost half of those seven years since the first XPG, the XPG3 has been the official working basis for implementing the XPG in user RFPs and vendor product lines.

The X/Open Common Applications Environment (CAE)

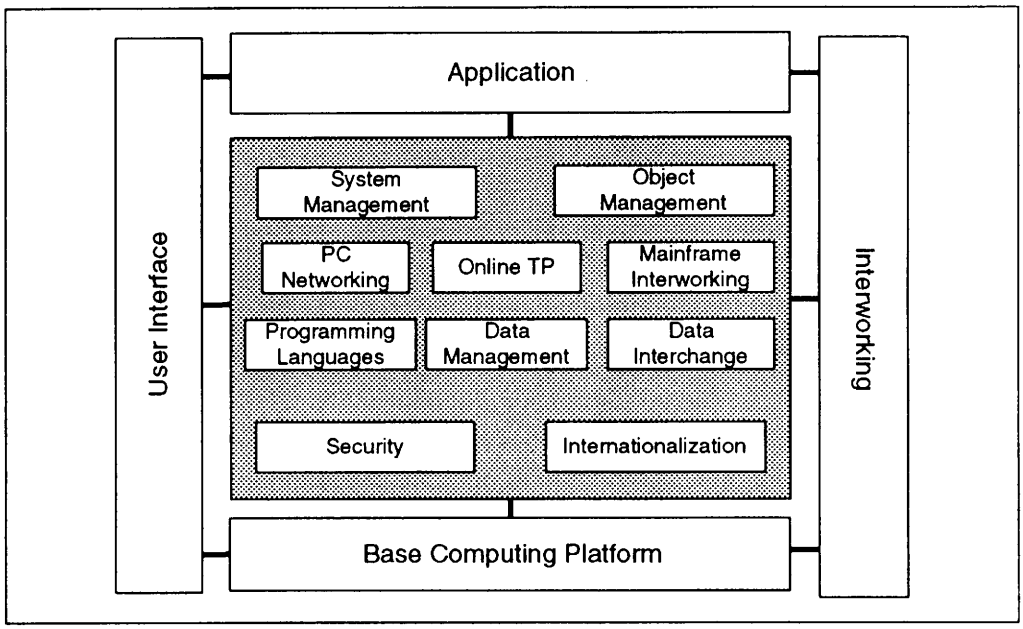

Illustration 1. The X/Open Common Applications Environment (CAE) illustrates the current dimensions of the X/Open efforts to define and develop specifications for open systems. System management, object management, and online transaction processing (OLTP) are considered areas in which detailed specifications will begin to appear in the next year, though some relevant specifications already exist for OLTP in the data management area, such as the XA specification for TP monitor/database interoperation.

XPG3 as a Baseline

XPG3 addressed source code portability for applications developed to run on single computer systems with X Window-based or character-based displays and PCs running terminal emulation. XPG3 began to venture beyond the bounds of portability with specifications for the first iteration of the XTI transport interface, a protocol-independent network transport API.

The XPG3 structure defined three levels of components: base, extension, and optional. (See Illustration 2.) The 1989 version of the CAE did not explicitly refer to work-in-progress or specific anticipated areas for future work, as does the 1992 CAE. As basic as XPG3 seems now, it was substantially ahead of the marketplace in 1989, and it has just begun to become an important factor in the purchase of Unix-based workstations—witness the NASA award discussed below.

Since the 1989 publication of XPG3, changes in technology and in the marketplace have at once reinforced the importance of XPG3 and obsoleted its packaging and scope. In crafting XPG4, X/Open found much about XPG3 nonextensible, except, of course, the underlying technical specifications.

XPG Components Are Key

XPG components bridge the gap between the specifications and the conceptual framework of the CAE. Specifications are the bedrock of the CAE, but the components are its most basic implementable, brandable elements. Each component consists of detailed specifications built from one or more de jure or de facto industry standards. Component specifications typically combine standards work from many sources to define the set of brandable components and the interface functionality of those components in sufficient detail to meet the needs of the system builder. X/Open is committed to ensuring that component specifications integrate into the CAE framework, so a generic four-dimensional model for component definition is applied to each new component. (See Illustration 3.) Most components do not have all four interfaces, but the methodology ensures that new components will integrate with existing XPG compo-

nents. For example, the XPG4 X.400 component does not have a Human/Computer Interface or an Interchange Format, but it certainly has a Portability Interface and a Communications Interface. On the other hand, the XPG4 Byte Stream File Transfer (BSFT) component has a Human/Computer Interface, a set of Interchange Formats, and a Communications Interface, but no Portability Interface. This model is critical to the profile concept of integrated components, discussed below, which was brought forth as part of XPG4.

Components do not necessarily map to products. One product could implement multiple components. For example, an operating system product might package Network File System and the X Window display system together with the internationalized system calls and commands and utilities—four X/Open components—for sale under a single catalogue number.

XPG3 Component Layering

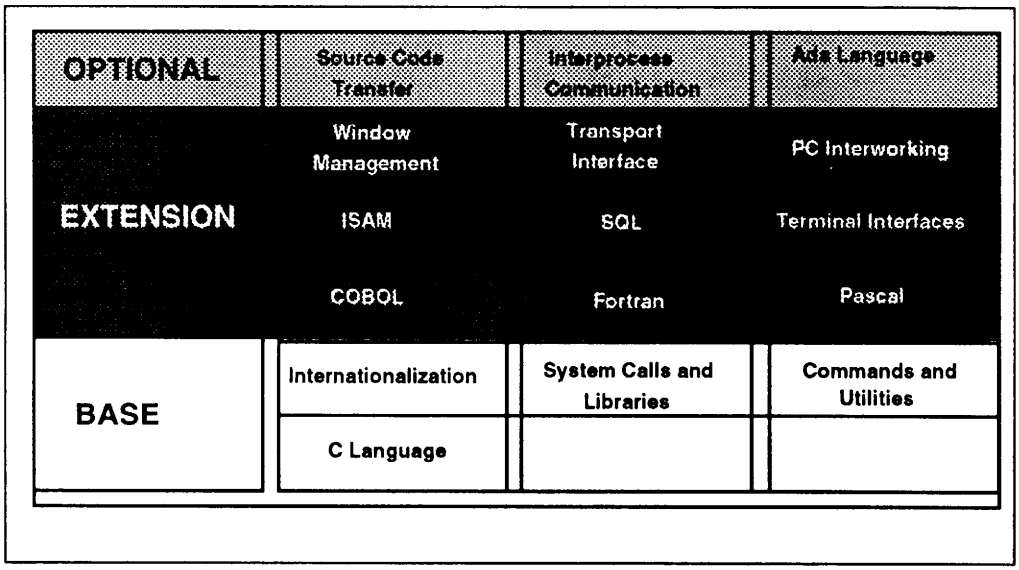

Illustration 2. In XPG3, components were divided into three categories to provide vendors with the flexibility to package the components appropriate to a particular market on the base platform.

X/Open Component Verification Testing and Branding

Next to the specifications themselves, one of the major foundations of the X/Open value to the industry is its verification and branding program. X/Open unveiled a trademark license and branding program in 1988 to designate products that have not only passed verification tests but whose vendors have committed themselves to some stringent warranty terms by signing the license agreement. The branding concept is a logical outgrowth of the open systems ethic that a user should be able to implement a functional system consisting of mix-and-match, standards-compliant products from multiple vendors. The branding and assurance program provided by X/Open essentially replaces the single vendor relationship of the past. The Trade Mark License Agreement language clearly requires a vendor to fully back branded products with bug fixes and support to either ensure full compliance with APIs or to surrender the right to label with the X/Open logo.

The Verification Test Crisis

Users have begun to invest significant expectations in the X/Open testing and branding program. Some consider the testing/branding dimension of the X/Open activity to be the ultimate service X/Open renders to the marketplace. X/Open has historically both contracted for the development of test suites outside of X/Open and developed them in-house. Today, test "production" lags behind the number of components being specified, and new components join the ranks each quarter. Also, integration tests will now be required for profile-branding. X/Open has two methods available to bridge this gap. One method falls back on the contractual agreement between the vendors and X/Open, wherein the vendors commit to making the

branded product work or lose the brand. This lever has never been pulled, but instances have occurred where the threat of revocation has motivated vendors to quietly make good on component conformance. The other method is to produce more tests, and quickly. X/Open is proceeding on both paths. The latter path has become a technical project to develop "assertion test" technology that would take much of the handwork out of the test development process. Between the two routes, X/Open hopes to maintain the public trust and confidence in its hard-won reputation as the Underwriters Laboratories of the computer industry and avoid falling victim to a verification testing bottleneck.

X/Open Component Interface Model

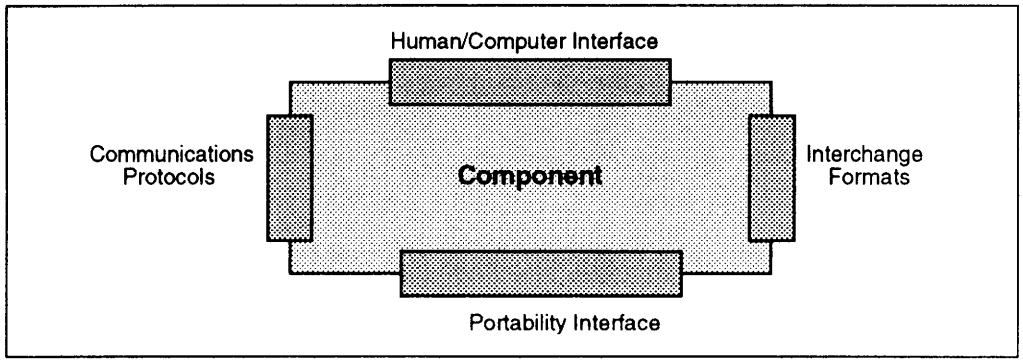

Illustration 3. An X/Open component is the basic element in the X/Open branding program. Components typically consist of multiple specifications, bridging the gap between specifications and products.

XPG4: New Form, New Substance

XPG4 was issued in October 1992, offering many new and updated components. XPG4 includes 22 components, 9 of which are new, and most of the remainder, updated. In form, XPG4 has been designed for enhancement and addition in key areas outlined in the CAE, particularly in the distributed computing technology areas of system management, object management, and OLTP. In substance, XPG4 has moved beyond the portability issue into interoperability as the primary focus, addressing issues of legacy data access and heterogeneous enterprise computing.

As in the past, X/Open remains committed to bringing existing components up to date with clear migration routes and to defining new components that will integrate with the CAE.

Profiles: The Hot New Item in XPG4

The 1991 Xtra survey asked for and XPG4 delivers groupings of components into profiles that offer something close to entities that users might actually buy. Profiles will be brandable when composed of branded components. Six profiles have been defined in XPG4, five of which have been fully defined; the sixth consists of "to be defined" distributed computing components. Brandable profiles include the Base Profile, OSI Communications Gateway Profile, Base Server Profile, Workstation Profile, and Database Platform Profile.

The Xtra Process: User Requirements Poll?

Xtra Past

In 1988, the Xtra process was devised to provide user requirements to the shareholders of X/Open. Each year, an extensive survey of users was conducted, the survey results were discussed at the Xtra World Congress, and a synthesis of the survey and the World Congress discussions was compiled into a publication called Open Systems Directive (OSD), which expressed to vendors the issues with open systems products users wanted to be addressed. The 1991 Xtra survey, considered by many to be the definitive open systems user survey to date, surveyed 237 prominent open systems user activists on four continents, and summarized the results of that survey and the prioritization discussion from the 1991 Xtra confer-

The Xtra Process: User Requirements Poll?

ence in the 1991 Open Systems Directive. The 1991 OSD prioritized the top five user requirements as follows:

1. Interoperability across heterogeneous systems and networks
2. An overall architecture for enterprise open systems computing
3. Heterogeneous networked database access and management
4. Integrated open and proprietary network management
5. Open systems access to proprietary mainframe applications

X/Open was heartened to note that the requirement for a single GUI had dropped from being a top requirement in the previous two Xtras to the number six position in the 1991 OSD.

Xtra Present

In 1992, the User Council formally received control over Xtra, and, in its first official act, flipped the poll around from a survey of users to a survey of vendors. The 1992 Xtra is termed a "supply side" survey, in which the users have surveyed the vendor community to determine the current and future open systems directions being pursued by vendors. The 1992 Xtra queried vendors on interoperability, distributed transaction processing, distributed systems and network management, and data management.

Why the Switch?

From the user viewpoint, there appeared to be little benefit to undertaking another large-scale user study on a one-year interval, but more importantly, this change signals that users are taking a vigilant role to ensure that the vendors are held accountable for putting R&D money where their mouths are—in open systems. It is also important to put this change in the context of more fluid vendor-user interaction within X/Open. A general atmosphere of "we're in this together" appears to be emerging. In this context, the switch to a supply-side survey could represent users establishing a better-informed baseline of vendor R&D commitments to enable users to more effectively and realistically prioritize future requirements.

X/Open Gets a Report Card, Too

The 1992 vendor survey has also provided X/Open with a more immediate measurement of its impact, which has been difficult to gauge because the Branded Products list measures only the end-point of a lengthy pipeline of processes. Xtra '92 will show to what degree vendors are currently investing in technologies that X/Open has articulated as important to the growth of open systems. Though Xtra 1992 does not survey users, a new issue of the Open Systems Directive will be published in the first quarter of '93 based on the user requirements that emerge from the working groups that assembled at the Xtra '92 World Congress in December 1992.

What Does Xtra 1992 Tell Us?

Not much new appears to have come out of Xtra 1992. Generally, the vendors are moving toward standards where they exist and in time frames that are in line with the standards processes.

Xtra Future: The Relationship of Xtra to XPG

In 1993, we expect to see Xtra return to a survey of user requirements. In order for users to benefit themselves at X/Open, they must provide a credible and somewhat objective basis for the requirements from which the technical work agenda is derived. The first measure of the value of the Xtra process is to see if the requirements translate into XPG components within X/Open. If the users bring anything to the party, it has to be an increasingly clear, specific, and credible description of the products they want to buy from the vendor community. On that basis, a supply-side survey testing the response to the 1991 user priorities does not advance the dialogue, and it certainly offers no new broad-scale input for the requirements prioritization that should occur at the annual World Congress.

The NASA Award

XPG Branding Drives a Big Procurement

NASA issued an RFP early in 1992 for Unix workstations that would support the development of portable and interoperable applications. The U.S. space agency RFP required compliance with two specific standards: POSIX and XPG3. On October 26, 1992, NASA awarded seven different pieces of the approximately $1 billion procurement to six workstation vendors: Sun Microsystems, Hewlett-Packard, Harris Computer Systems, IBM, Silicon Graphics, and Digital Equipment Corporation. While vendors were allowed to self-attest to POSIX compliance, all of the workstation vendors were required to present an XPG3 branding certificate before the "live test demonstration." In order to make the next step, some of the winners are now fast-tracking through the X/Open certification process. In light of the NASA procurement and other large-scale government procurements where XPG has been specified, the meaning of the X/Open brand has jumped to a new level of importance.

Issues Facing X/Open for the Future

The X/Open Value Proposition: Branding, Branding, Branding

X/Open serves a complex set of stakeholders, and, as with any organization, it derives its legitimacy from its stakeholders' trust that the time, effort, and money they have invested in X/Open will deliver value. Stakeholder groups vary in defining value: Large system vendors, ISVs, small system vendors, government users, commercial users, and other consortia and standards bodies each bring an agenda to the party. But the common denominator is the value of X/Open verification testing as represented by the brand. X/Open is wealthy in the currency of brand credibility, in part because it has figured out how to accomplish something that others have talked about but have been unable to do—demonstrate the ability to produce tests that actually mean something in the purchase of multivendor computer systems. A generally skeptical industry and user community believes that X/Open branding means something. X/Open should husband this value and make absolutely sure that expectations based on the branding of profiles do not compromise its credibility, particularly in the eyes of users.

Fighting the Good Fight against Fragmentation

Over the past two years, X/Open has had to cope with the formation of special interest user groups which, in some cases, have been founded on a countercultural position. Two major user organizations, POSC and the IBM user's group GUIDE, are working particularly closely with X/Open. GUIDE joined the user council in the past year. While POSC is not actually a member of X/Open, three of its principal members are on the X/Open User Council. This is also the case with the Group of Ten, which emerged in 1991. In order to succeed in its mission, X/Open must include the efforts of these groups in order to forestall fragmentation.

The OSI Influence Threatens Market Distortion

Fundamental differences exist between the needs of public sector and private sector users. X/Open, by virtue of its roots, puts great importance on the OSI model. Through GOSIP, the U.S. government has placed enormous weight behind OSI. But the private sector in the United States shows few signs of OSI adoption. Private sector users inside and outside X/Open find the OSI bent troubling. Vendors, knowing that some of the X/Open work pertains solely to the government market, point to the OSI issue as a force that could undermine the value of X/Open in its quest to represent the needs of the lucrative commercial marketplace in the United States. Vendors fear that the OSI push could result in their having to develop product

Issues Facing X/Open for the Future

that is only applicable in the government sector and suffering poor return on investment. X/Open needs to find a way to meet the needs of the government users without warping the marketplace by acquiescing to government requirements that simply do not apply to the commercial U.S. market.

The User Interface Wars: Tilting at Windmills

In 1990, a joint user/vendor committee tried to nail the multiple-GUI issue by defining a single API to implement OpenLook and Motif. The task then broadened to include Presentation Manager and Windows. The workings of the committee became unwieldy due to branding rules considerations and industry politics, and X/Open dropped this hot potato. X/Open learned a painful lesson about tilting at windmills in situations where an X/Open determination would create big winners and big losers. Instead, the group has thrown its energies into forming close working relationships which cross user, vendor, integrator, and association lines to ensure that critical emerging technologies, such as object technology and distributed OLTP, create a win-win situation for all concerned with open systems.

Conclusion

Faster Than a Speeding Bullet...

In order to "make open systems safe for users," X/Open could probably use the help of an old-fashioned superhero. Superman could turn coal into diamonds in an instant, circumventing the organic processes of time and chance. But X/Open is challenged to find a real-world methodology to compress the time it takes to go from defining requirements to branding products. X/Open must find a way to continue to increase the participation of users and vendors without becoming bloated with new agendas and processes. The recent attraction of systems integrators into X/Open should help increase the real-world time scale of its processes.

The United Nations of the Computer Industry

The $300 billion dollar computer industry houses innumerable special interest organizations. X/Open functions like the United Nations as it weaves a common fabric out of the diverse self-interests of system vendors, users, ISVs, system integrators, and narrow-agenda groups. X/Open does appear to suffer from "reputation lag" in the market, which it might address by visibly hastening the commercialization of the hot technology areas on its 1993 agenda. As the only game in town, X/Open will always attract criticism, but it deserves credit for consistently achieving consensus from a situation rife with conflict. We think that, overall, it has served its constituency well along this uncertain path to open systems, but, in this unforgiving industry, X/Open will have to continue to earn its bars if it wants to stay in the pilot seat. ◐

Next month's *Unix in the Office* will address two topics:
X/Open XPG4 and High-Availability Systems

For reprint information on articles appearing in this issue,
please contact Donald Baillargeon at (617) 742-5200, extension 117.

Open Systems: Analysis, Issues, & Opinions

FOCUS: OPEN SYSTEMS AND UNIX

Novell and USL: "Open NetWare" Is the Way to Beat Microsoft

Novell Buys Unix (and Open Systems?)

Novell has decided that an open systems strategy is its best hope of slowing down the Microsoft juggernaut. Novell's announced intent to purchase AT&T's Unix System Laboratories (USL) will collect under one corporate roof NetWare, the dominant PC LAN operating system, and Unix System V, the dominant open systems application platform. By offering both platforms to its customers, Novell can deliver a set of distributed computing services available on multiple LAN protocols and server operating systems *and* a widely available, scalable platform for building distributed applications. In the minds of many customers, it will also become the vendor most closely associated with open systems.

OPEN SYSTEMS AS A COMPETITIVE WEAPON. Novell won't unify NetWare and Unix System V—at least not anytime soon. Rather, the two will exist side by side within a relatively complete open distributed computing environment. Microsoft's Windows NT won't be able to deliver equivalent scalability, widespread availability, and interconnection of multiple operating system environments until 1994 at the earliest. In the meantime, Novell will seek to brand Windows NT as just the latest in a line of proprietary operating systems and networking environments. Novell will position itself as the ultimate open systems vendor. With hundreds of commercial licensees, Unix System V is not just the de facto operating standard but the basis for many formal standards as well. And NetWare is a multiplatform distributed computing environment that either supports every major standard today or will in the near future.

CONTINUED INDUSTRY TURMOIL. Novell's planned purchase of USL, announced just before Christmas 1992, signals the beginning of a dramatic shift in the dynamics of the open systems movement that will be felt thoughout the entire computer industry. The open systems movement—a collection of Unix systems vendors, independent software vendors (ISVs), and ad hoc user organizations—had largely accomplished its goal of breaking the stranglehold on the industry held by IBM, Digital Equipment Corporation, and other established vendors. The movement's legacy is dramatic reductions in the cost of systems and applications and equally dramatic changes within most major system vendor organizations.

However, the open systems movement has never been very effective in addressing the question of how to fit PCs and distributed computing into its Unix-centric picture. Now, Novell has accepted responsibility for resolving this question. How it does so will impact most vendors and tens of millions of users worldwide.

The Deal of the Year: Unix for $330 Million

Novell paid, in effect, approximately $330 million for USL. This wasn't a cash transaction but an exchange of stock. After the deal is finalized, AT&T will own 3 percent of Novell, and the minority holders of USL will own less than 1 percent of Novell stock.

USL has not been a profitable operation for AT&T. AT&T has never been able to translate owning the Unix trademark into competitive advantage, in large part due to the history of Unix licensing. After all, the Open Software Foundation (OSF) was created largely over the issue of "fair and equitable licensing terms."

What did Novell buy? Since one can license the source code for USL's technologies for a lot less than $330 million, Novell was obviously shopping for more than an operating system (Unix SVR4), some language and compiler technology (C and C++), and a transaction monitor (Tuxedo). What Novell really acquired was rights to the Unix trademark and the mantle of open systems. It purchased credibility as a player in Unix and open systems, an increasingly important market segment among large corporate buyers. And it bought an extra ace in its hand to play against Microsoft.

What the Deal Means to USL

USL will continue to be a standalone operation under its new ownership. It will fulfill commitments it has made to its licensees, partners, and Unix International. However, under the control of Novell, USL will now be free to pursue sources of value-added that make business sense to Novell as a publicly-held company. Support for distributed computing and management are just two areas in which USL can be expected to concentrate its efforts.

It is likely that USL will begin to de-emphasize its work on future operating system development after the acquisition. Even though many of the specialized versions have begun to converge with Release 4.2, operating system development is expensive, thankless work—just ask the OSF. There are plenty of competing sources of advanced Unix operating system technology in the industry—including the OSF, SunSoft, Chorus Systems, and Carnegie Mellon—to adequately take care of USL's licensees. Instead, we expect USL to become a Novell development center for open systems-based distributed services that will, over time, be integrated with NetWare services.

What the Deal Means to Open Systems

Unix is bigger than USL and, depending on your perspective, bigger than AT&T. Although USL has always controlled the direction of Unix evolution, it had to work under the guise of guidance and approval from the general Unix industry in the form of Unix International. It often had to invest development dollars into projects that made technological sense from the point of view of Unix licensees but made no business sense from the AT&T perspective.

Novell's acquisition of USL will signal major shifts in the open systems movement. Unix licensees will now be faced with paying license fees to a company against which they directly compete, both in distribution channels and on customer premises. Before the creation of Univel in 1992, USL had no direct channel of distribution. On the other hand, it had access to every channel, since Unix was sold by its licensees through a broad range of channels. Post-acquisition, USL will be competing with all of its licensees much more directly than it ever has before. As a result, many are likely to look elsewhere for their technology.

OSF GAINS PENETRATION. Some USL licensees may choose to go the OSF/1 route. Such an action would breathe new life into the prospects for OSF's operating system efforts. Even though OSF would be competing with USL in the area of operating system technology, OSF will become a major source of open systems technology to Novell and USL. OSF's Distributed Computing Environment (DCE) will become a key component in Novell's open systems direction. Over time, NetWare will support access to DCE's directory services, as well as to its remote procedure calls and security features. It is also safe to assume that other components of USL's directions for distributed computing, including support for OSF's DME, will be included in a future "Open NetWare."

With the potential of widespread distribution of its technology through Novell's channels, OSF may find that the USL acquisition is the best thing that ever happened to it.

X/OPEN RISES TO THE TOP. In some ways, the X/Open Consortium and its XPG become critical parts of Novell's Open NetWare strategy. As other vendors have discovered, slapping the word "open" on a product is not sufficient to cause it to be accepted as an open systems product. XPG branding is increasingly becoming the requisite stamp of approval. We expect that a future technology coming out of USL would have NetWare services and XPG branding. We further expect Novell to advocate for having certain of its key protocols included in future X/Open specifications and profiles.

UNIX INTERNATIONAL'S FORTUNES SINK. The role of Unix International becomes less clear than it ever has been. Its road map for Unix was largely a reflection of where USL was going anyway. It functions largely as an advocate, proselytizer, champion, and missionary for Unix. With Novell's marketing and distribution organizations now fulfilling those roles, what role is left for Unix International? There is already a large Unix users group—UniForum. X/Open is the designated standards integration consortium in the industry. Novell is able to obtain customer feedback from numerous sources. OSF is the industry's software think tank. Unix International may become an organization of open systems ISVs, at best, serving an advocacy and education function.

SUN IN A PIVOTAL POSITION. Sun is caught between a rock and an opportunity. On the one hand, NetWare combined with Unix competes directly with Sun's most strategic products, the Solaris environment with its Open Network Computing (ONC) and PC NFS. Two of Sun's business units, SunSoft and SunConnect, rank Novell and Univel as their arch competition. Sun has several options that it can pursue, and the Unix and open systems industry will be watching the company very closely to see how it reacts. Sun could ignore the acquisition and face loss of market share on the

desktop; embrace it, and license and resell the various combinations of NetWare and Unix; or strike back and ditch System V, put Solaris interfaces on top of the Mach 3.0 microkernel, and go into direct competition with Novell and the OSF as a supplier of PC networking and operating system technology.

MICROSOFT'S OPTIONS. Although taking the open systems high ground seems like a sound strategy for Novell in competing with Microsoft's minimally standards-compliant NT direction, it is a fragile position. With only a slight amount of backpedaling and public relations smoke, Microsoft could adopt XPG branding as a key part of its operating system strategy. Even worse for Novell, Microsoft could expand its support for DCE beyond its current plans, completely co-opting Novell's distributed computing offensive. Novell believes these to be unlikely moves on Microsoft's part, but Novell should talk to the IBM OS/2 people about how easily Microsoft can shift strategies midstream.

WHERE DOES SCO GO? Santa Cruz Operation (SCO), a leading seller of Unix software for low-end systems, was close to mending fences with USL and basing its future direction on SVR4. Now, with Novell pushing Unix as its application platform, SCO will be competing with Novell for every installation currently running SCO products. SCO has a narrow range of choices open to it, since it depends heavily on outside sources for technology. SCO could end up as a Novell OEM customer and license SVR4 and perhaps UnixWare also. It could return to its OSF/1 strategy from the days of the ACE initiative. Or it could become the provider of the XPG-branded version of Windows NT, mentioned above. Of the three possibilities, only the OSF/1 strategy is unlikely.

What the Deal Means to Novell

With this acquisition, Novell will have a dual-product strategy. The first product is NetWare, which is a set of connectivity and distributed computing services available on many different platforms. The second product is an operating system for application servers—Unix. In both cases, users have the freedom to choose multiple desktop environments, including DOS, Windows, Macintosh, or Unix.

With USL in its hip pocket, Novell will become a different company than it is today. Novell will be a *platform* company, not just a networking company. Customers will be able to go to Novell to obtain the operating systems and services software they need to build sophisticated distributed applications.

This change is apparent in Novell's comments about its plans to rationalize its standing product lines and those of USL.

REPOSITIONING OF NETWARE. Novell took great pains in discussing its plans for Unix System V to assure the open systems community that its hard-fought gains won't be lost in the fine print of the deal. Novell did so by outlining a two-platform strategy that included a repositioning of NetWare.

In the new Novell, NetWare will become a distributed computing environment. That is, NetWare will no longer be sold primarily as a server-based "network operating system." Rather, it will be sold as a multiplatform connectivity engine and a related set of distributed computing services, including directory, security, object management, imaging, and so forth. Novell has been moving in this direction with NetWare 3.11 and 4.0 for some time.

Novell will sell Unix System V, on the other hand, as a general purpose operating system environment. Unix System V will be the preferred environment for users to develop custom applications—not NetWare. In other words, Novell will no longer recommend that users build custom applications with NetWare Loadable Modules (NLMs) as their primary applications platforms. Rather, Novell will recommend Unix System V as that development platform, with NetWare providing the distributed computing foundation for access to other objects in the environment. NLMs have been repositioned as a mechanism for building NetWare services, such as directory, image management, and object management. This is not an entirely new positioning for NetWare, since Univel has been backing into it in its positioning of UnixWare, native NetWare, and NetWare for Unix (formerly Portable NetWare).

CONSOLIDATION OF UNIX AND PC LANS. When the deal is consummated, Novell will have the opportunity to consolidate two separate streams of development in the computer industry. The first of these streams is open systems, which has been built largely on Unix as a base. The second is PC LANs, a market dominated by NetWare. Conceptually, this consolidation is very attractive. It means that developers will be able to integrate Unix-based application servers with PCs and Macintoshes on the most widely used LAN protocols much more closely and with greater ease than is possible today.

However, accomplishing the integration will be an arduous task that will surely occupy Novell for the rest of the decade. Novell will face challenges in three

distinct areas: management, APIs, and networking protocol access.

Common Management. NetWare will be increasingly manageable via SNMP. This isn't so today. Novell's current SNMP implementation only works on IPX, not TCP/IP, and it is incomplete. Novell has now committed to a common management API across NetWare and Unix System V.

Common APIs. NetWare, which is often perceived as a single product, is actually several products with often-incompatible APIs. And these APIs are different still from those that exist and are planned for Unix System V. For the consolidation of NetWare and Unix to have any meaning for corporate developers, Novell will have to harmonize these APIs. The company has a three-stage plan for doing so.

The first stage is the culmination of an existing effort to consolidate the various NetWare client APIs into a single set of cross-platform APIs. Applications on DOS, Windows, Macintosh, and other clients will be able to call NetWare's services through the same or similar API calls. These APIs will also be provided on Unix System V clients. The result should be increased portability of applications across NetWare clients.

The second stage of Novell's plan is to provide a C++ class library that provides access to its service APIs. This library will contain objects that encapsulate the semantics of accessing the NetWare services. To use a particular service, developers will subclass from these objects, making developing for the NetWare environment easier. Novell has already begun work on this project also.

The third stage is a long-term effort in conjunction with Symantec Corporation (Santa Monica, California), Apple Computer Incorporated (Cupertino, California), and others to develop a full environment for building distributed applications using the NetWare services and Unix as an application server platform.

Novell hasn't yet released the details of any of the three steps, other than to commit to two broad goals. The first goal is to make the NetWare APIs as close to the POSIX operating system interface standards as possible. The second is to add the APIs specified in UI-Atlas and the APIs for USL's Tuxedo into the NetWare interfaces.

Common LAN and WAN Service Access. Novell plans to consolidate the access to LAN and WAN services from within applications running on Unix and other platforms. Of particular interest are WAN protocols, including SNA and X.25.

DCE: NOVELL'S LINK OUTSIDE NETWARE. The latest version of NetWare—NetWare 4.0—is, itself, a distributed computing environment. It includes directory, security, remote execution services, distributed file access, and the other major distributed computing services. This puts NetWare into direct confrontation with the Open Software Foundation's Distributed Computing Environment. DCE will be at the heart of distributed computing products from IBM, Digital, Hewlett-Packard, and many other vendors, making it a formidable competitor.

As recently as the NetWorld trade show in October 1992, a top Novell executive dismissed DCE as a solution looking for a problem. There was no customer demand for Novell to support DCE, said Darrell Miller, executive vice president. When there was demand, Novell would support DCE.

However, USL has already committed to supporting DCE in Unix System V. Indeed, UI-Atlas, its road map for the Unix System V, is largely based on DCE for distributed computing services.

Novell resolved this apparent conflict by committing to implementing support for DCE as an *interoperability* mechanism between NetWare and the rest of the world. This is good news for major corporate users who are banking on DCE as their distributed computing foundation. It means that Novell will license DCE and support it as a key way of communicating with non-NetWare systems.

However, Novell's announcement *does not* mean that DCE services will gradually replace NetWare's current and planned services. Novell views DCE services as an option similar to NetWare for SAA, Novell's gateway to IBM SNA environments.

THE IMPACT FOR NETWARE USERS. Current NetWare users will see little immediate effect from the Novell-USL deal (assuming it is completed). The company plans to run USL as a standalone operation, maintaining the Unix International process for feeding customer requirements into USL's development lab.

In the meantime, Novell will continue its existing program to provide developers with a rational, easier-to-use set of APIs to the NetWare services. It is only when Novell begins to layer the APIs of Unix System V and Tuxedo into NetWare that developers will see changes. We hope the changes will be for the better, but they might not be.

Novell is a pragmatic company, and its plan to deal with the different APIs it will gain as a result of buying

USL fits this corporate personality. The company has specifically rejected the notion of merging the Unix System V and the NetWare APIs. Novell will continue to maintain its multiple APIs for the foreseeable future. Novell won't break existing code by changing APIs. Rather, it will seek to hide the differences among its APIs under C++ class libraries.

Unfortunately, encapsulating APIs is not an answer to the problem of multiple APIs; it is just a tactic for dealing with heterogeneity. For corporate developers to truly enjoy the benefits of the NetWare distributed computing services and the scalability and richness of Unix as an application server platform, Novell is going to have to clean up its APIs at some point. If it doesn't, the complexity of the environment Novell presents to corporate developers will be a major obstacle to acceptance of its plan to merge the open systems movement and PC LANs.

Conclusions

This acquisition once again changes the structure and dynamics of the computer industry. It raises uncertainty about the future of Unix as well as the future strategies of many Unix licensees. It also raises questions about directions for many Unix-related issues, such as standards ranging from POSIX to OMG's CORBA. Much will depend on how USL is integrated into Novell's corporate structure and culture. If USL is left essentially in charge of its own fate, which has been Novell's history with acquisitions, little will change. But if Unix starts creeping more and more into Novell's strategy, the reverberations will be heard thoughout the industry.

Nobody can blame AT&T for ditching an unprofitable operation. We may now learn just how unprofitable it has been. This deal has set the stage for a year of shifting alliances and, perhaps, shifting fortunes.

— J. Rymer and M. Goulde

Patricia Seybold's Computer Industry Reports

ORDER FORM

Please start my subscription to:		U.S.A.	Canada	Foreign
☐ *Patricia Seybold's Office Computing Report*	12 issues per year	$385	$397	$409
☐ *Patricia Seybold's Open Information Systems*	12 issues per year	$495	$507	$519
☐ *Patricia Seybold's Distributed Computing Monitor*	12 issues per year	$495	$507	$519
☐ *Paradigm Shift—Patricia Seybold's Guide to the Information Revolution*	6 issues & tapes per year	$395	$407	$419
☐ *Paradigm Shift—Patricia Seybold's Guide to the Information Revolution*	6 issues per year	$295	$307	$319

Please send me ☐ *Distributed Computing Monitor* ☐ *Open Information Systems*
a sample of: ☐ *Office Computing Report* ☐ *Paradigm Shift—Patricia Seybold's Guide to the Information Revolution*

Please send me information on: ☐ Consulting ☐ Special Reports ☐ Conferences

☐ **My check for $_____ is enclosed.** ☐ **Please bill me.** ☐ **Please charge my subscription to: Mastercard/Visa/American Express** (circle one)

Name: _____ Title: _____
Company Name: _____ Dept.: _____
Address: _____
City, State, Zip code, Country: _____
Fax No.: _____ Bus. Tel. No.: _____

Card #: _____
Exp. Date: _____
Signature: _____

Checks from Canada and elsewhere outside the United States should be made payable in U.S. dollars. You may transfer funds directly to our bank: Shawmut Bank of Boston, State Street Branch, Boston, MA 02109, into the account of Patricia Seybold Group, account number 20-093-118-6. Please be sure to identify the name of the subscriber and nature of the order if funds are transferred bank-to-bank.

Send to: Patricia Seybold Group: 148 State Street, Boston MA 02109; FAX: 1-617-742-1028; MCI Mail: PSOCG
To order by phone: call (617) 742-5200

IO-193

Topics covered in Patricia Seybold's Computer Industry Reports in 1991 & 1992:

Back Issues are available, call (617) 742-5200 for more information.

Office Computing Report

1991—Volume 14

#	Date	Title
12	Dec.	IBM/Lotus Relationship—Building a Platform for Communicating Applications

1992—Volume 15

#	Date	Title
1	Jan.	The Groupware Phenomenon—Does It Focus on the Proper Issues?
2	Feb.	Digital's TeamLinks—A Renewed Focus on the Client Desktop
3	Mar.	Requirements for Workflow—What Should We Expect from the Vendors?
4	Apr.	Desktop Multimedia—Moving beyond the Chicken and the Egg
5	May	Borland International—A Database-Centric, Object-Oriented Approach to Desktop Integration
6	June	Apple's Macintosh—Can It Become "the Cadillac of Collaboration"?
7	July	Business Intelligence—A Framework for Data Analysis Applications
8	Aug.	The Quest for Common Mail APIs—Clearing up the Confusion
9	Sept.	BeyondMail for Windows—Epitomizing the Mail-Enabled Application
10	Oct.	Microsoft's Workgroup Strategy—Moving Group Functionality into Windows
11	Nov.	Visual Programming—Application Design for End Users and Professional Developers
12	Dec.	The Notes Phenomenon—The Industry Reacts to Lotus Notes

UNIX in the Office

1992—Volume 2

#	Date	Title
1	Jan.	Downsizing with Open Systems—Can Unix Symmetric Multiprocessing Systems Meet MIS Requirements?
2	Feb.	System V.4 and OSF/1—Matching up in the Marketplace
3	Mar.	Europe's Harness Project—Integrated Technology for an Open, Object-Oriented, Distributed Applications Platform
4	Apr.	The X Window System—Where is Its Future?
5	May	HP's Master Plan—Winning Is Everything in Palo Alto
6	June	Digital's DECworld Gems—Alpha and Accessworks Shine

Open Information Systems

#	Date	Title
7	July	Integrating Applications in the Real World—Evolution, Not Revolution
8	Aug.	Windows NT 3.1—Microsoft's Bid for Desktop Dominance
9	Sept.	Oracle's Version 7—Can It Leapfrog the Competition?
10	Oct.	Galaxy from Visix—Application Portability Breakthrough?
11	Nov.	European Open Systems Architectures—Europe's Vendors Strike out for Open Distributed Systems
12	Dec.	The Unix Data Center—Fact or Fiction?

Network Monitor

1992—Volume 7

#	Date	Title
4	Apr.	Message Express—A Message Platform for Cooperative Processing
5	May	Novell NetWare 4.0—Building toward an Enterprise Distributed Object Computing Environment
6	June	Distributed Printing—Major New Approaches Begin to Relieve One of Distributed Computing's Most Frustrating Problems

Distributed Computing Monitor

#	Date	Title
7	July	The New E-Mail APIs—Finally, Real Progress toward Mail-Enabled Applications
8	Aug.	Distributed Object Computing—The Merger of Distributed Computing and Object-Orientation into a New Architecture
9	Sept.	Gradient DCE for PCs—PC-DCE Spurs OSF to Make PCs Peers to Unix and Other More Powerful Platforms
10	Oct.	Database Interoperability—A Comprehensive Approach to Database Access for the 1990s
11	Nov	Transarc Encina—Will Distributed OLTP Systems Overrun the Mainframe's Last Stronghold?
12	Dec.	UI-Atlas Distributed Management—Object-Oriented, Distributed Management for the Unix System V World