

INPUT[®] Research Bulletin

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A Publication from INPUT's Federal Information Technology Market Program

Federal Government UNIX Market

New technologies appearing almost daily in the marketplace threaten the survival of traditional products. One traditional product that has enjoyed long-term success in the federal marketplace is UNIX. With emerging technologies and major marketing thrusts targeting workstation environments, some analysts claim that the demand of desktop UNIX will be exhausted. This bulletin examines some of the issues that will influence the direction of the federal market with respect to the UNIX desktop market.

The Federal Government Is Partitioned With Respect to UNIX

In spite of obvious overlaps in memory management and processing capability, distinctions between complex instruction-set computers (CISC) for the desktop and reduced instruction set computer (RISC) workstations are still made on functional grounds. Office systems, data base development, and routine programming environments are the domain of CISC, while scientific and high tech image-based applications are the domain of RISC. Text-based interfaces are improving for CISC personal computers, but these interfaces are not

yet where UNIX-based RISC workstation environments have been operating successfully over the past decade.

UNIX remains dominant as the multiuser, multitasking operating system in the federal government, while DOS-based personal computers dominate in more traditional, heavily populated office applications. UNIX has not been successfully implemented on (IBM-compatible) personal computer platforms because of its considerable demands for memory and high volume data transfer rates.

Within the federal government, UNIX is normally associated with Sun Microsystem RISC-based workstation platforms. AT&T, DEC, Hewlett-Packard/Apollo, IBM, and Intergraph platforms are also found in these environments. UNIX on CISC-based personal computers is limited for the most part to Apple Computer's Macintosh processors. Apple's implementation of UNIX (A/UX) for the Macintosh offers full functionality, but Apple has been unsuccessful in breaking into the federal government personal computer market, with less than 10% of the installed base. Other vendors are improving their UNIX-based products, but they are not appearing significantly in federal agencies.

UNIX Is Widely Distributed

Because UNIX is effective in high tech, multi-tasking environments, UNIX workstations can be found virtually everywhere, as shown in Exhibit 1. The 44% figure for military services (combined Army, Navy and Air Force) can be attributed to the fact that the Department of Defense has been standardizing on UNIX for their workstations. Both the Department of Energy and National Aeronautics and Space Administration represent other high tech environments in which UNIX has been heavily used. Laboratories in several agencies comprise the remainder of the installed base.

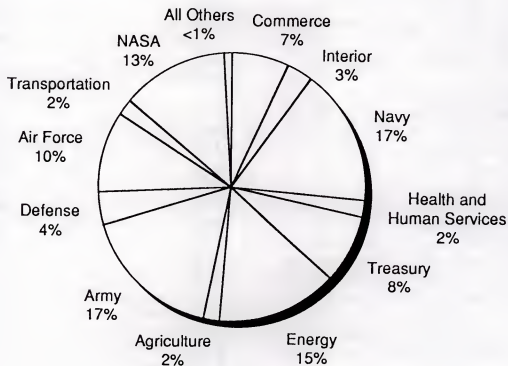
Workstations and midrange platforms that operate under UNIX are widely represented by different manufacturers (Exhibit 2). Not surprisingly, AT&T (22.8%), Sun (20.3%), and Intergraph (16.8%) all hold most of the market share, but several other vendors are represented. Exhibit 2 shows the distribution of vendors across workstation and UNIX midrange platforms installed in the federal government.

The Future of UNIX Is Dim

The largest threat to the UNIX environment appears to be Microsoft Corporation's anticipated new technology (NT) product. While NT is not yet appearing in federal

Exhibit 1

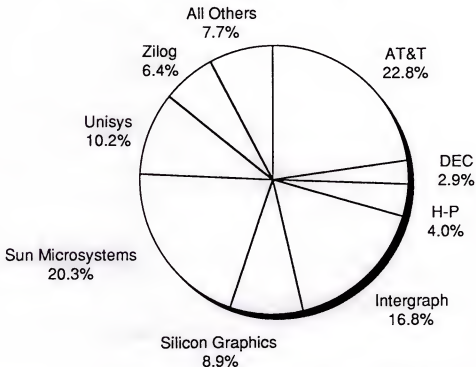
UNIX Distribution in the Federal Government



Source: Computer Intelligence

Exhibit 2

Manufacturers of UNIX Midrange Platforms Installed in Federal Agencies



Source: Computer Intelligence

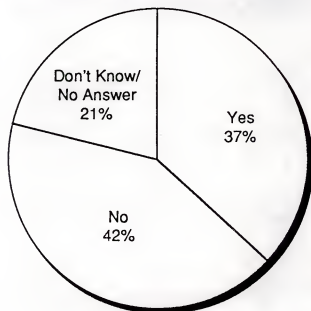
agencies, it promises considerable potential for high-end personal computer applications. Most of these high-end platforms are installed as part of local area networks (LANs), and the need for an effective operating environment across these LANs exists throughout those government offices where UNIX historically has not played well.

Results from a Dun & Bradstreet/UniForum survey of participants at the March 1993 UniForum Conference and Trade Show revealed that 37% believe Microsoft's new network-operating system product will extend benefits not offered by UNIX (Exhibit 3). Less than a majority (42%) believe NT would not extend benefits not offered by UNIX, and only 22% of those interviewed indicated they were unsure about comparable benefits. Without

considering the needs of these specific users, one could imagine a ground swell of interest in NT as an alternative to UNIX.

Many agencies are installing Microsoft's Windows, a product which is orienting DOS-users to the advanced graphic user interface environments that, until only recently, had been supported principally on Apple's Macintosh platforms and in UNIX-based RISC workstations. The transition to Windows running on a LAN positions the NT product favorably to challenge UNIX, at least on high-end CISC personal computer platforms, particularly if one ignores the nature of the actual applications running in UNIX-operating environments. In actuality, the anticipation of NT on the network may serve more to improve operations for the personal computer-based

Exhibit 3

Will NT Offer Benefits Not in UNIX?

Source: Dun & Bradstreet Software

The NT challenge against UNIX as the dominant network-operating system could be dissipated as a result of the recent purchase of UNIX Systems Laboratories from AT&T by Novell Inc. Novell's Univel subsidiary has set a goal to both unify UNIX products and bring UNIX as an operating system into the domain of personal computers. The combination of talents and capabilities from both organizations suggests a serious force to continue UNIX effectiveness, as a minimum in those workstation environments in which it has played successfully over the years. The fact that Novell networks have been the overwhelming choice of federal users offers an advantageous, installed base to support a new UNIX-network product that could migrate from high tech environments to the domain of the personal computer.

LAN, and it can provide more clarity regarding appropriate applications for UNIX-based workstation networks.

At this point, the recent partnership between Microsoft and MIPS (now owned by Silicon Graphics) suggests an argument that the RISC workstation may be targeted by NT, but existing UNIX users in the government are skeptical that a serious challenge can be effected.

The Future of UNIX Is Bright

Developers in the UNIX market are not sleeping. The PowerPC chip, jointly produced by IBM, Apple, and Motorola will support many new desktop applications, and a new version of IBM's UNIX operating system (AIX) is now under development. Apple itself is shipping an upgrade for its A/UX product (Version 3.0), which offers full UNIX functionality.

What Does UNIX Need?

The predominant CISC personal computer operating environment in the federal government continues to be DOS, with no serious challenges short of Microsoft's NT. Microsoft's recent DOS upgrades and enhanced Windows product, especially for the network environment, represent major improvements in traditional office-based LAN operations. However, UNIX still has a performance advantage in RISC environments. Microsoft's NT is being promoted by some market analysts as an alternative to both DOS on CISC network servers and UNIX on RISC servers.

Agency officials are interested in upgrading operating system functionality and manageability of both RISC and CISC environments. While both UNIX and NT are potential operating systems in either environment, both cannot serve simultaneously

as a single standard government-wide network operating system. As it stands now, NT is slow getting started in the marketplace, and UNIX developers have time to adjust to criticisms of its limitations. UNIX will not likely replace the Microsoft products as preferred operating systems on personal computers, but it can solidify its hold on the workstation processors.

The lack of effective standards will remain a question mark in UNIX network operating environments. Users continue to cite problems with the multiplicity of installed UNIX versions. UNIX International, the vendor body attempting to address the problem of multiple versions of UNIX, announced, late in 1992, the formation of a work group to set direction for future releases of the System V version. Original Equipment Manufacturers (OEMs), Independent Software Vendors (ISVs), and end-users are included in the work group. Nothing yet has been made public, at least for federal users.

UNIX developers have two strategic directions to follow. First, developers must solidify UNIX's existing installed base. They appear to be doing this. New and improved products are being marketed to bridge existing installed applications across UNIX platforms provided by different vendors. More rugged UNIX-based tools, which take advantage of recent advanced hardware technologies, are necessary to provide interoperability between programs operated by different agency programs.

For federal government users, the anticipated competition between NT and UNIX is presently not a real issue. Agency buyers are occupying a "wait and see" position. Currently, the potential environments for each product are distinct and separate. The possibility that NT will make inroads into traditional UNIX workstation

environments, or that Novell's UNIXWare network-operating system will make inroads into corporate network environments, is not a well-discussed issue among federal agency information technology buyers. These officials will let the issue resolve itself in the commercial markets.

The outcome of this mostly hypothetical competition could cause concern to users in either office or workstation environments because of the need to protect installed applications. For the foreseeable future, network-operating systems in federal agency RISC workstation environments will improve around upgraded UNIX products and tools. Network-operating systems in federal agency CISC desktop environments will improve around Windows-based or Apple-based applications, and may benefit from a rugged, fully functional NT product. Operating systems which potentially cross over environments will meet with stiff resistance.

While small COTS applications are easier to sell than big UNIX applications, software that can be easily moved from platform-to-platform has a huge potential market. UNIX configurability, programming capabilities, and multiuser nature all can eliminate the drawback of today's LANs. In federal agencies, a larger issue must be addressed. Users must adjust their organizational processing scenarios to a transition, from single users attached to networks to multiple users operating multi-tasking applications in network environments. This is a difficult task, and vendors should be prepared to help.

This Research Bulletin is issued as part of INPUT's Federal Information Technology Market Program for the information services industry. If you have questions or comments on this bulletin, please call your local INPUT organization or Bob Deller at INPUT, 1953 Gallows Road, Suite 560, Vienna, VA 22182, Telephone (703) 847-6870, Fax (703) 847-6872.

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