

Microsoft® Desktop Operating Systems

Product Line Overview *Microsoft Business and Personal Systems Divisions— February 1996*

Windows® 95 and Windows NT™ Workstation Product Comparison: How to make the right decision for your organization, now and in the future

EXECUTIVE SUMMARY

Microsoft has two strategic corporate desktop operating systems, Windows 95 and Windows NT Workstation. More and more code will be shared on both platforms over time, however, there will continue to be two complementary desktop operating system products, to meet the diverse needs of customers. Both products are strategic for organizations because they enable a new generation of applications based on the Win32(tm) API and OLE(tm), lower your support costs, and help users be more productive—across all desktops. Today's personal computers are being used for a many different tasks ranging from simple word-processing to complex mathematical calculations and financial transactions. Given the added complexity of a huge installed base and tremendous customer investment in hardware and software, no single operating system can optimally satisfy these diverse requirements.

Many customers reflect these needs within their organizations and are therefore deploying both operating systems in a mixed-mode strategy. With their common API set (Win32™) and a common object technology (OLE™), both products are an attractive combination and coexist well in mixed environments. Both are less costly to own than Windows 3.x or Windows for Workgroups due to increased reliability, built-in supportability tools, and greater ease of use.

This White Paper provides a reference framework for your evaluation. By selecting the right product or mix of products given your specific corporate needs and constraints, you can achieve the most cost-effective migration to a 32-bit Windows operating system on all your desktops. Whether you deploy Windows 95, Windows NT Workstation, or go for a mixed solution, you cannot make a mistake. Microsoft will continue to enhance both products and provide a smooth migration path to future versions of both products.

WHY DOES MICROSOFT OFFER TWO DESKTOP OPERATING SYSTEM PRODUCTS?

Microsoft has multiple desktop operating system products because that is what is required to meet the diverse needs of corporate customers. Organizations not only need great compatibility and performance for the broad installed base of systems being used for mainstream business applications, they also need the ability to run the most demanding applications on systems which exploit the latest advances in system technology. They need to run common applications throughout the organization, provide employees with an easy to use system that makes them as productive as possible, and manage all their desktops with a minimum of expense. To meet these needs, Microsoft will provide consistent interfaces for application developers, end-users, and administrators across the product line. With the introduction of Windows 95 and Windows NT Workstation 3.51, it is now possible to run the exact same Win32™ and OLE™ application on both platforms. With the next release of NT Workstation (version 4.0, expected in mid-1996) Microsoft will provide an identical user interface on both products. Both products already contain the essential infrastructure to do effective desktop management, by providing a System Registry which is accessible remotely through the Win32™ API. Microsoft will continue to enhance the system management capabilities of Windows 95 and Windows NT Workstation to make the desktop easy to manage centrally in a large, complex organization. (For a summary of the similarities and differences of the products, see page 4).

HOW DO I MAKE THE RIGHT DECISION FOR MY BUSINESS TODAY AND IN THE FUTURE?

To make the move to a 32-bit desktop as cost-effective as possible, either operating system may be the right choice. Very often a mix is the right answer. To make the best decision we recommend that you look at the needs and constraints of your organization. Whether you need to equip salespeople to create compelling presentations on the laptops that you bought last year, or enable scientists to calculate the results of massive, complex models on a multiprocessor desktop in a high-security laboratory,

Microsoft has a Windows operating system that meets your needs. Consider the following examples:

Mobile Users

Many companies have employees who spend a significant fraction of their working hours away from their office, whether they're at a customer site, in a hotel, or in remote locations, and rely on mobile form-factor computers to help them perform their jobs. These mobile computer users need integrated features, such as electronic mail, fax, and remote networking, which ease information access from whatever location. They need a high level of compatibility with their current devices and applications, and an operating system which places moderate demands on the system (RAM, disk space, battery power) and provides Plug and Play device configuration capabilities. Since Windows NT Workstation will not provide Plug and Play and Advanced Power Management capabilities until the 1997 release, Windows 95 is the best choice today.

Developers and Technical Workstation Users

Developers, engineers, scientific researchers, statisticians, and other technical users often run processing-intensive applications, while also using business productivity applications. Today, many of these users must have both a UNIX-based workstation and a PC on their desk to get their job done. Windows NT Workstation can save costs by meeting their demands for greater processing power while also running Windows-based personal and business productivity applications on the same system. Windows NT Workstation provides the performance of a leading-edge workstation or mini-computer at a fraction of the cost, with its support for symmetric multiprocessing (SMP) and its portability to different high-performance platforms like those based on Alpha AXP, PowerPC, or MIPS-based CPUs.

General Business Desktop Users

For the Business Desktop, Microsoft highly recommends that you begin by examining the business problem you're trying to solve. If you decide to deploy a mix, there is good news for you. It has become much easier to deploy both products in your organization today, and to realize the advantages of moving to a Win32-bit operating system. Benefits of a 32-bit Windows desktop include:

- Lower support requirements
- Improved system management
- Higher end-user productivity
- Superior application platform¹

To make the right decision, we recommend that you consider the following issues:

¹ For more information on the financial benefits of moving to a 32-bit Windows platform today, several studies are available for your reference, including studies done by Workgroup Technologies and Usability Sciences. These studies, and additional information are available on www.microsoft.com.

Are your applications, devices and systems ready for Windows NT Workstation?

To answer this question, you need to compile the following information about your computing environment:

- Do your current systems have the resources (recommended 16 MB RAM, 90 MB hard drive space and a fast 80486 microprocessor) required to run multiple applications on Windows NT Workstation?
- Are there Windows NT Workstation drivers for the devices you have in place, including video cards, drive controllers, proprietary 3270 devices, and network interface cards? The Windows NT Hardware Compatibility List can be used to determine if drivers are available for these devices.
- Are your applications compatible with Windows NT Workstation? If you have an application that requires an MS-DOS or Windows device driver or TSR, you will need to upgrade that application to a version which can run on Windows NT Workstation.
- If the answer to the above questions is yes – in the areas that the applications and hardware you have in place are compatible with Windows NT Workstation, or as you bring in new hardware – then you should deploy Windows NT Workstation because you will be able to take advantage of the premium features it offers without incurring substantial incremental cost during the migration. In your existing (non NT-capable) installed base, or where Windows NT Workstation is incompatible with applications or devices, Windows 95 will benefit your organization immediately.

Do you need the additional application and system protection features offered by Windows NT Workstation?

In some situations, the business cost from a disruption in service caused by an application bringing down another application or the system can be very high. This may occur in a transaction-processing environment where the data that may be lost due to an application error is extremely valuable, or a customer service environment where the cost of keeping the customer waiting while restarting the system is high. Windows NT Workstation can help minimize these costs by running Win16 applications in separate address space (often referred to as separate virtual machines) so that if one Win16 applications fails, all of the other applications will continue to run. Win32™ applications running on both platforms provide greater reliability through use of separate memory address areas, multiple asynchronous message queues, and structured exception handling. Windows NT Workstation provides an additional level of protection for the system by completely separating operating system and application code, and can be configured to automatically restart if the system fails.

If these additional protection features offered by Windows NT Workstation are important for your business, you should upgrade your desktop computing environment today so you can deploy Windows NT Workstation.

Do you need the data security features offered by Windows NT Workstation?

In industries or functions that need to protect sensitive data or application files, such as banking, defense, or human resources, the value of having a secure desktop is very high. (Data on a server would, of course, be protected by the server system's security capabilities). Both Windows 95 and Windows NT Workstation can help prevent naive users from damaging their system configuration. Beyond this, the Windows NT File System (NTFS) can be configured to completely restrict access to systems and data. This prevents malicious users from deleting system files or damaging line-of-business applications. A Windows NT Workstation system can even be shared by multiple users and still maintain security for all files on the system. Windows NT Workstation has passed the requirements for the United States government C2 security certification.

If these additional protection features offered by Windows NT Workstation are critical for your business, you should upgrade your desktop computing environment so you can deploy Windows NT Workstation.

SO HOW SHOULD I PLAN MY OPERATING SYSTEM ROLL OUT DURING THE NEXT SEVERAL YEARS?

You should move to the 32-bit platform today based on the guidelines above. In many cases a combination of both Windows 95 and Windows NT Workstation will provide you with the most tangible benefits **today** and the ability to deploy new Win32 applications throughout your organization now and in the future.

Instead of having multiple operating systems require different applications (MS-DOS, Windows, Macintosh, UNIX), you can consolidate on one application platform today. Because applications that carry the "Designed for Windows 95" logo must also run on Windows NT Workstation, and because future releases of Windows NT Workstation and Windows 95 will share the same user interface, end-users will be able to switch between the two operating systems with little or no impact.

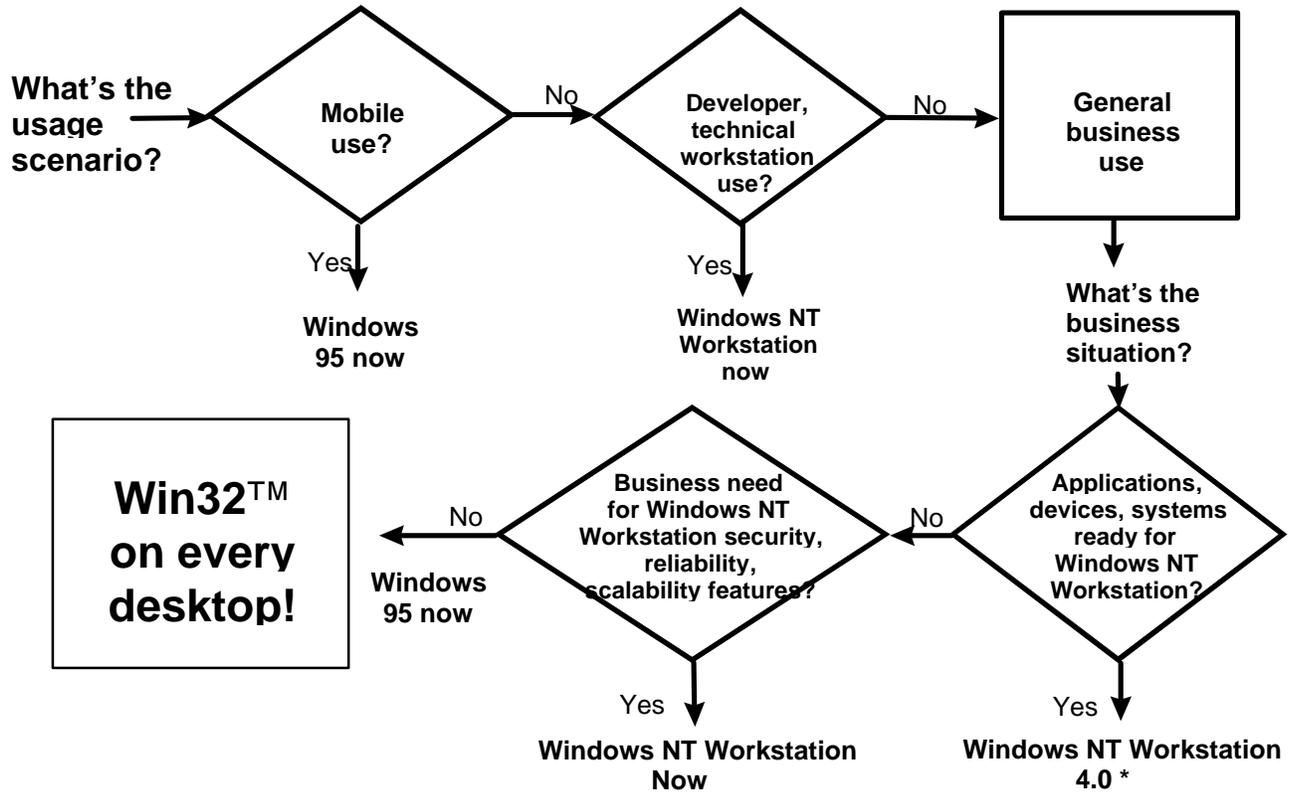
For the greatest flexibility in the future, you should plan your hardware purchases today to be compatible with and provide adequate resources for responsive performance running a full suite of applications on future releases of Windows NT Workstation. You should buy at least 16MB (recommended) of RAM and 500 MB of disk space (more will always give you greater flexibility) and select products from vendors who are providing device support for Windows NT Workstation.

No matter which system you choose, you cannot make a wrong choice. Microsoft will continue to invest heavily in both products, and will design new functionality to run across the entire product line. Over time the products will share more fundamental technology. Today, Windows 95 and Windows NT Workstation share technologies in the Win32™ API, OLE™ and networking. In the future, we

expect them to will share even more capabilities, including the new User Interface, Direct Draw, and further down the road Plug and Play capabilities, OpenGL, network OLE™, and more multimedia API's. Due to differences in product development cycles, the technologies noted may appear on one product prior to the other, but these differences will be temporary. This means that your investment will be protected by having the ability to run the same Win32™ applications across all your desktops. Your investment will also be protected because Microsoft will strive to provide a smooth migration path between each product in the desktop operating system product line.

Microsoft is doing several things to help you start your migration today. In February 1996, the Service Pack for Windows 95 will provide free and convenient access to new drivers and components for Windows 95, as well as updates to address the very few significant problems identified since release. With over 20 million copies shipped the quality of Windows 95 is excellent and it has undergone widespread use by both businesses and consumers. To make it easier to deploy a mix of Windows 95 and Windows NT Workstation, Microsoft will deliver the new user interface and tools for managing a mixed Windows 95/Windows NT Workstation environment in the Windows NT Workstation version 4.0 release, due in mid-1996. And, to make migration a simpler financial proposition we now offer a license which for a single price per desktop provides the option to run whatever mix of Windows desktops is right for you and receive all upgrades for two years. To learn more about how to make your migration as successful as possible, please visit the Windows Web site (www.windows.com) or contact your local Microsoft representative or Solution Provider partner.

How to Plan the Migration



*, Windows NT Workstation 4.0, also referred to as the "Shell Update Release" features the Windows 95-compatible user interface, administrative tools for managing mixed Windows 95/Windows NT Workstation environments, and other functionality available today for Windows 95. This release will greatly simplify the rollout of a mixed Windows 95/Windows NT Workstation environment within your organization.

SIMILARITIES OF WINDOWS NT WORKSTATION AND WINDOWS 95

This table summarizes features which the products will share over time. The next release of Windows NT Workstation, (version 4.0) scheduled for mid-1996, will bring the user interface into parity across both products. Additional feature differences which exist today but will be resolved in the future are noted as "Future Release".

Product Feature	Windows 95	Windows NT Workstation
Application Support		
■ Win32 API for application development, OLE™ for linking data across applications	Yes	Yes
■ Preemptive multitasking of Win32 applications	Yes	Yes
■ Runs Win16 applications	Yes	Yes
■ Multimedia API's (DibEngine, Direct Draw, DirectSound, Direct Input, Reality Lab 3D graphics libraries)	Yes	Direct Draw and DirectSound: mid-1996 Release; Others: 1997 Release
■ Network OLE™	Future Release	mid-1996 Release
■ OpenGL graphics libraries for 3D graphics	Future Release	Yes
Ease of Use		
■ Auto-detection and configuration of hardware during installation	Yes	Yes
■ Next-generation Windows User Interface	Yes	mid-1996 Release
■ Plug and Play technology that lets you add hardware automatically and dynamically reconfigure the system	Yes	1997 Release
Connectivity		
■ LAN connectivity and peer-to-peer networking, with all popular protocols including TCP/IP, IPX/SPX, DLC and NetBEUI	Yes	Yes
■ Open networking architecture provides choice of clients, transports and drivers and extensibility for support of third party networking applications	Yes	Yes
■ Built-in Remote Access services	Yes	Yes
■ Built-in universal inbox providing email and fax	Yes	mid-1996 Release
■ Built-in Microsoft Network (MSN) client software	Yes	Delivered separately post 4.0 Release
Manageability		
■ Open system management architecture provides infrastructure for third party system management solutions	Yes	Yes
■ Supports existing and emerging system management standards (SNMP, DMI)	Yes	Yes
■ System Policies to provide centralized control over desktop configuration	Yes	mid-1996 Release
■ User profiles to provide consistent configuration for roving users or different users sharing a single system	Yes	Yes
■ Remote monitoring of system performance	Yes	Yes
System and Peripheral Support		
■ Fully exploits 386DX, 486, and Pentium platforms	Yes	Yes
■ Disk compression	Yes (for VFAT file system)	Yes (for NTFS file system)
■ Dynamic PCMCIA support (don't have to reboot system to add a device)	Yes	Static today, Yes in 1997 Release
Support and Service		
■ Quick Fix Engineering teams to solve critical problems at specific sites	Yes	Yes
■ Immediately post new drivers and component updates on line	Yes	Yes
■ Regular Service Pack releases to provide new drivers and component updates	Yes	Yes

DIFFERENCES OF WINDOWS NT WORKSTATION AND WINDOWS 95

This section summarizes differences in the two products that will persist over time.

Product Feature	Windows 95	Windows NT Workstation
Application Support		

Microsoft Windows 95 and Windows NT Workstation Market Bulletin

■ System Resource Capacity	Greatly expanded	Unlimited
■ Runs MS-DOS applications	Yes	most
■ Runs IBM Presentation Manager (through 1.3) & POSIX 1003.1 applications	No	Yes
Application and Data Protection		
■ Preemptive multitasking for Win16 applications	No	Yes
■ System completely protected from errant Win16 and Win32 applications	No	Yes
■ NTFS file system provides complete protection of files on a stand-alone system (Files, folders, and applications can be made “invisible” to specific users)	No	Yes
■ Has automatic recovery from a system failure	No	Yes
System and Peripheral Requirements and Support²		
■ Runs MS-DOS device drivers	Yes	No
■ Runs Win16 device drivers	Yes	No
■ Recommended RAM for running multiple applications	8MB	16MB
■ Typical disk space requirement	40MB	90MB
■ Runs on PowerPC, MIPS, and DEC Alpha AXP-based RISC systems	No	Yes
■ Supports multiprocessor configurations for scaleable performance without changing operating system or applications	No	Yes

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² Windows NT Workstation requires 16 MB (recommended) RAM 486 or greater, or compatible RISC-based system. Also, certain categories of applications that try to directly access hardware will not work on Windows NT Workstation because they compromise security or system robustness (e.g. applications that try to directly access hardware such as Norton Utilities, some MS-DOS games requiring specialized hardware access, and old MS-DOS and Windows device drivers, including VxDs). In some cases, we have been able to virtualize access to the hardware. For instance, Windows NT Workstation v. 3.51 supports Delrina WinFax Pro and WinFax Lite.