MS-DOS 3, MS-NET, and Windows

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I will spend the next 45 minutes discussing MS-DOS issues, and particularly the enhancements that we will bring to this new standard personal computer operating system. However, before looking at what the future has in store, I would like to go over a little bit of history.

First Generation Personal Computers

- Examples
  - Apple II
  - CP/M machines
- Characteristics
  - 8-bit processor
  - 64Kb of memory
  - Variety of bus and video architectures
- Microsoft began with this generation
  - Basic
  - Apple II Softcard

It all began with the first generation of Personal Computers. The Apple II and a variety of CP/M based machines are good examples. From a technical standpoint, these machines had the following characteristics in common : an 8 bit processor, such as the Intel 8080, the Motorola 6502 or the Zilog Z80 and 64KB of adressable memory. They all used different bus and video architectures. This lack of standardization did not allow the development of a significant add-on accessories industries. An extension card for, say, an Apple II would not fit into the chassis of a Commodore pet.

Microsoft began with this generation. It first offered a BASIC interpreter and made a first attempt at pushing standards by selling the Apple softcard, which let Apple II users run the CP/M operating system.

At this point, the personal computer industry needed a more widely acceptable hardware platform in order to overcome the fragmentation which had prevented it from reaching critical mass.

When it was first introduced, along with the IBM PC in 1981, MS-DOS Version 1 was basically a 16 bit adaptation of the CP/M operating system.

Version 2, released in 1983 with the PC-XT, marked a clear break from CP/M. Because it needed to do a good job of supporting the PC-XT, it came with a sophisticated hierarchichal file system that let user better manage their files and documents.

Version 3, released in 1985 with the PC-AT, included networking functionality, so as to better satisfy user's need to better communicate and share expensive resources such as printers and peripherals.

In fact, MS-DOS has kept pace with the industry and also with its customers adding necessary support when needed. Our latest version, MS-DOS 3.2 features 3 1/2 " media support.

Before we go further, let us again go over the factors which have made MS-DOS a standard.

MS-DOS

- Why did it become a standard?
  - An open, consistent architecture supported by many hardware manufacturers
  - The decision to use a 16-bit chip
  - The momentum of the software industry

Nine million compatible machines IS something of a miracle!

First, the adoption of an open, consistent architecture provided a standard platform that made it economically possible to develop both hardware and software solutions that would solve customers problems.

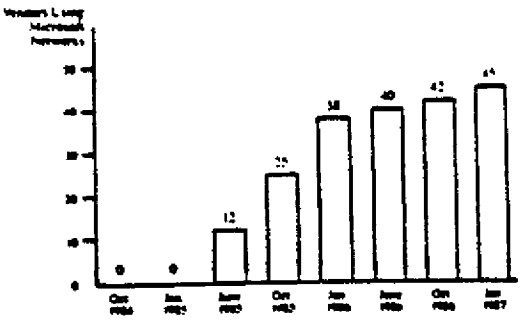
Second, the power of a 16 bit chip gave software applications programmers the opportunity to develop products powerful enough to be a real help to power users such as businesses. For instance, the 640KB of memory 1-2-3 was able to use made it considerably more powerful than its CP/M based competitor Visicalc, while its raw functionality was not fundamentally different.

Finally, the dynamics and the momentum of the software industry attracted a very large number of companies to develop a variety of applications, letting a single machine solve a large number of unrelated problems.

If nine million machines certainly represents a miracle, this miracle did not quite happen in a day. Standards just do not happen overnight as the following slides will show.

Another example: Windows. It took a good year for Windows to gather significant momentum. In January of this year, however, 850,000 copies had been shipped compared to 50,000 for IBM's similar offering, Topview.

Standards Develop Over Time



MS-NET also illustrates our point very well. Although it is part of all major LAN suppliers offering today, it had a relatively slow start and took nearly two years to become the standard product it is today.

Let us now take a look at these three products in a little more detail.

MS-DOS Features

- Single-user, single-tasking
- Designed for 8086/88-based PCs
- Runs on all PCs
  - 8086/8088, 80286, 80386
- Supports a multi-volume hierarchical file system
- Simple command interface

MS-DOS is a single user, single tasking operating system. It is designed to run on 8086/88 based PCs, which means it lets applications address 640 KB of memory. It runs on all PCs including the 80286 and 386 based machines.

It supports a multivolume hierarchichal file system, with full directories and subdirectories capabilities. It also comes with a simple and powerful command interface that includes advanced features such as output redirection and pipes.

Also, Windows takes care of devices specific matters, leaving the programmer free to concentrate on his application rather than the peripherals that will support it. For this reason, Microsoft keeps increasing its device drivers support, to make sure that programmers can take advantage of the latest available hardware.

Windows also supports data exchange mechanisms at two levels. First, it lets users cut part of a document such as a spreadsheet and paste it into a memo written with a wordprocessor. Moreover, it also lets applications transfer data from one to the other. This way, a stock market monitor can communicate real time with an application that helps a stockbroker make buy/sell decisions.

So, Windows is more than just a pretty interface and a convenient environment. It is also a product that enhances MS-DOS capabilities by providing task switching and sophisticated data exchange mechanisms.

Networking is another way to share and communicate data. Let us take a closer look at Microsoft offering in this area, MS-Network.

Microsoft Networks

- Full-featured Local Area Network (LAN) software for MS-DOS and XENIX machines
- First introduced for MS-DOS in 1984, XENIX in 1986
  - Over 50,000 nodes installed
- Sold through OEM channel exclusively
  - Major OEMs include:

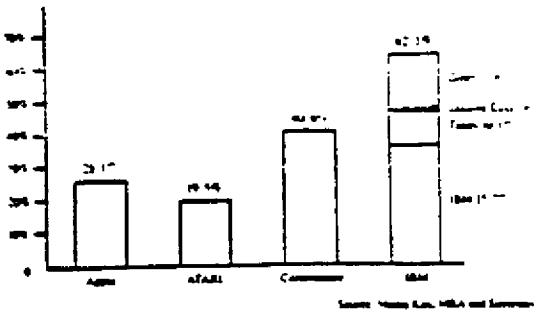
    AT&T DEC IBM 3 Com
    Bull HP NEC U/B
- Established industry standard interfaces:
  - SMB protocols
  - Net BIOS interface
  - MS-DOS redirector

Microsoft Networks, also known as MS-Net, is a full-featured local-area network software for MS-DOS and Xenix machines. It was first introduced for MS-DOS in 1984, for Xenix in 1986. It is currently installed on 50,000 nodes.

Sold exclusively through OEM channels, it is as the basis of many companies network solution offering. AT&T, IBM, NEC, BULL, HP to quote only but a few.

As other Microsoft products, it has established industry standard interfaces. Server message block protocols or SMB, Net BIOS interface and the MS-DOS redirector are the best known. Microsoft Networks is also quite rich in features.

Current Brand Ownership by Percentage



Brand Ownership by Percentage Change
(1984-86)

	1984	1986	% Change
Apple	20.4%	26.1%	+ 28%
ATARI	23.9%	19.5%	
Commodore	55.5%	40.6%	
IBM	24.1%	35.7%	+ 48%
Tandy	7.2%	10.1%	+ 40%
Leading Edge	N/A	9%	+ 100%
IBM/MS DOS Compatibles	N/A	15.6%	+ 100%
Total IBM	24.1%	62.3%	

We will do so not only because we want to improve upon the quality of the product we offer to our installed base of users, but also because we want to effectively support the very quickly increasing number of MS-DOS users in the homes and the schools.

The numbers you can see on this slide speak for themselves. In the home market, the MS-DOS market share has gone up from around 30% in 1984 to more than 60 % in 1986. The introduction of compatibles by Commodore, the increasing penetration of Tandy personal computers and substantially decreasing compatible prices are some of the factors that will help improve MS-DOS penetration of the home market.

Both IBM and Tandy have seriously penetrated the school market, where their current market share is 14 and 17 % of total sales respectively. This trend is likely to continue, as schools want to expose their students to MS-DOS, the business world operating system standard.

MS-DOS 3.30

- Improved national languages support
  - Lets user choose between different character sets
  - Lets DOS access more country-specific information
  - Supports EGA/IBM LCD displays, new IBM printers
  - Supports NLSFUNC, new T & SR command. NLS implementation

Finally, MS-DOS 3.30 includes improved National Language Support. MS-DOS 3.30 now has access to extended country information, such as collating sequences, currency format and more, which was not available in previous releases.

Also, the user can now switch between different character sets, which was impossible before. We support Portuguese, Finnish, Canadian French and other character sets.

We are already planning for a MS-DOS 3.31 version, that will feature even more I/O performance improvements. Without mentioning, of course, MS-DOS 3.4...

Microsoft Windows Future

- Enhanced/Improved
  - Performance
  - Old application support
  - Expanded memory
  - New device support

We are also working hard to improve on Windows.

Let us discuss performance first. We are working to improve the efficiency of our graphical device drivers. We also will expand our memory management capabilities. In terms of expanded memory, Windows will support bank switching schemes.

Finally, Microsoft will continue to enhance its device support as new peripherals such as scanners, plotters and laser printers become available.

CONFIDENTIAL

Windows 2.0

Tandy Trower, Director
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Where We Are

- Award-winning product - PC Magazine, PC World, InfoWorld, Software Publisher's Association
- On SoftSel HotList since shipment
- Windows - The Solutions Magazine
- User groups
- International releases - support for over 26 countries
- Over 750,000 copies sold world-wide

It is appropriate before presenting our future plans for Microsoft Windows in the DOS 3 environment to briefly review the last year's highlights.

- **Award Winning Product** - Microsoft Windows received a number of awards from the major computer publications - including PC, PC World, InfoWorld, and the Software Publisher's Association
- **SoftSel Hotlist** - Since its shipment, Microsoft Windows has consistently been on SoftSel's Hot List of the top 30 business products (their toughest category).
- **Windows Magazine** - In February, PCW Communications, publishers of successful magazines such as PC World, MACWORLD, and Publish!, announced their plans to introduce a new user magazine this fall based on Microsoft Windows.
- **User Groups** - Windows popularity has grown so significantly that user groups are even springing up around the product. A Chicago group boasts over 500 members.
- **International Releases** - Windows has not only increased in popularity in the US, but gained momentum internationally. Windows is available both retail and through major OEMs in a number of languages, including Dutch, French, German, Italian, Spanish, Swedish, and Kanji versions.
- **Growing Sales** - Over 850,000 copies of Microsoft Windows have been sold to date.

Increased Output Performance

- Better internal algorithms
- Driver redesign

The first major enhancement will be a dramatic improvement in output performance. This will be accomplished by:

- Improving the underlying algorithms found in the Windows graphics kernel.

  In reviewing our internal routines we have found ways to provide faster throughput for functions, such as line drawing and text output. Since many applications depend on these functions, they will see immediate improvement.

- Improving our device drivers.

  By continuing to study the variety of devices in the marketplace, and the new trends in device capabilities, we have found ways to improve the way that Windows works through these devices, taking more advantage of what they have.

Better performance has an important impact on the acceptability of Windows on existing hardware. These improvements may broaden the appeal of Windows on a larger range of hardware.

Memory Manager Enhancements

- Support for expanded memory
  - Continued support for LIM EMS
  - New extensions for expanded memory
    - Design to support both EMS and EEMS boards (others)

This release of Windows will include extensions to the Windows memory manager that will give it the ability to run applications in expanded memory. (Note expanded memory is memory provided via devices that provide bank switch technology—e.g. Intel Above Board, AST RAMpage card, etc. This is not the same as extended memory which is the term used to refer to memory above 1 megabyte).

When an application is run, all or part of the program is placed in expanded memory (depending on the hardware configuration and capabilities of the expanded memory device). This allows applications to run more efficiently, and in fact, users may be able to run more applications, since expanded memory can now be used to store those programs.

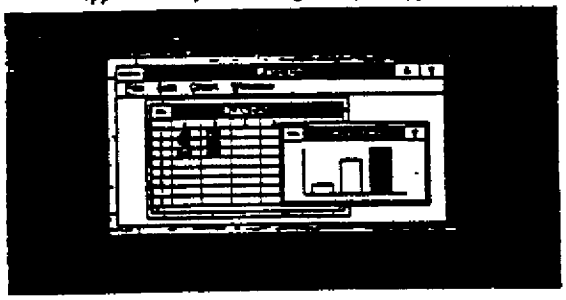
There have also been some improvements in the mouse interface to menus. The current "spring-loaded" method of press-drag-release sequence is still supported, but in addition, a user may also click on a menu title which will cause the menu to be displayed until the mouse is clicked on a command or somewhere else on the screen. This allows the user to inspect a menu without needing to hold the mouse button, a major plus for new users

In addition icons have been placed in the title bar to provide a fast, direct interface for mouse users to maximize or minimize a window.

Visual and operational fidelity with the OS/2 Presentation Manager will allow developers the opportunity to create applications that have the same look and feel in both the MS-DOS and OS/2 environments. An obvious benefit to users as it allows them to transfer their learning skills across both operating systems.

Multiple Document Interface Support

- Application style to manage complex applications



As in the current implementation, an application developer has freedom to design the internal contents of the application's window as he sees fit. However, Windows also provides basic building blocks and style guidelines to promote a common interface approach.

With the change to an overlapping environment, there is great potential for the clutter on the screen to make working with an individual application difficult. If that application includes multiple windows of its own. To help the developer maintain order, some additional functions have been added to facilitate a style we called the Multiple Document Interface. This style recommendation is specifically designed for complex applications that may offer the capability to simultaneously display different views of the same data (spreadsheet, chart, etc.) or different sets of data. Such applications can implement these views or documents as separate child windows that are always kept within the parent application windows. This eliminates the document windows from getting lost on the screen among the other application windows.

At the same time, it should be understood that a goal for compatibility is a difficult thing to measure. (This is a potentially unbounded task to undertake since software is not developed cleanly, and sometimes breaks the rules.) It is not our intention to guarantee the infinite variety of possibilities, but to work with existing developers who have Windows related software products in the market and provide as seamless a path as possible for their applications to run with little or no modification.

Availability

This version of Windows is now in testing. We anticipate release of this version in the third quarter of this year.

Migration

Windows also helps application developers better prepare for development under the OS/2 environment. Version 2.0 provides a common visual and operational set of interface with the OS/2 Presentation Manager (both use messages, menus, dialogs, buttons, scroll bars, etc.).

However, while version 2.0 preserves the current Windows API (application program interface), there are differences between it and the OS/2 Presentation Manager. Application binaries written for Windows on DOS will not run without modification under the OS/2 Presentation Manager. This is due in part to changes in the underlying file I/O system and changes in the internal parts of the Windows Presentation Manager itself. Many of these changes are syntactical in nature and the conversion effort will be largely mechanical. Some areas may require some recoding effort. To assist developers in this effort, we are already looking ahead to provide information on the differences and define some conversion tools that will help migrate 2.0 applications to the OS/2 Presentation Manager. These will be included as part of the Presentation Manager components of the OS/2 toolkit.

Conclusion

This release will be very significant, both to the existing users and developers, because it provides increased performance and use of memory, improved user interface operation, and bridging between the DOS and Windows application world.

The good news is that many of the improvements in this release are generally transparent to the application. Existing Windows applications will be able to reap the benefits of these features without changes. And for enhancements like the keyboard access improvements, the changes for the application developer are optional and can be added easily.

This release will provide the foundation that a number of significant products will build upon and provide access in the MS-DOS world to the interface that will continue to be a basic part of a user's PC system.