

Microsoft Operating System Strategy

"The Pitch"

Steve Ballmer

**Senior Vice President
Systems Division**

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Plaintiff's Exhibit

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Comes V. Microsoft

Graphical User Interface

The market has moved this direction,
common user access is the key.

- OS/2 Presentation Manager
- Windows/286, 386
- SAA
- OSF/Motif
- Macintosh

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Microsoft Windows

- Immensely successful
- Over 50,000 retail copies per month
- As popular as Macintosh
- Focus for most new DOS development
- Rich set of applications
Excel, Pagemaker, Designer, Illustrator,
Samna Ami ...
- New releases focus on size, user
interface appeal

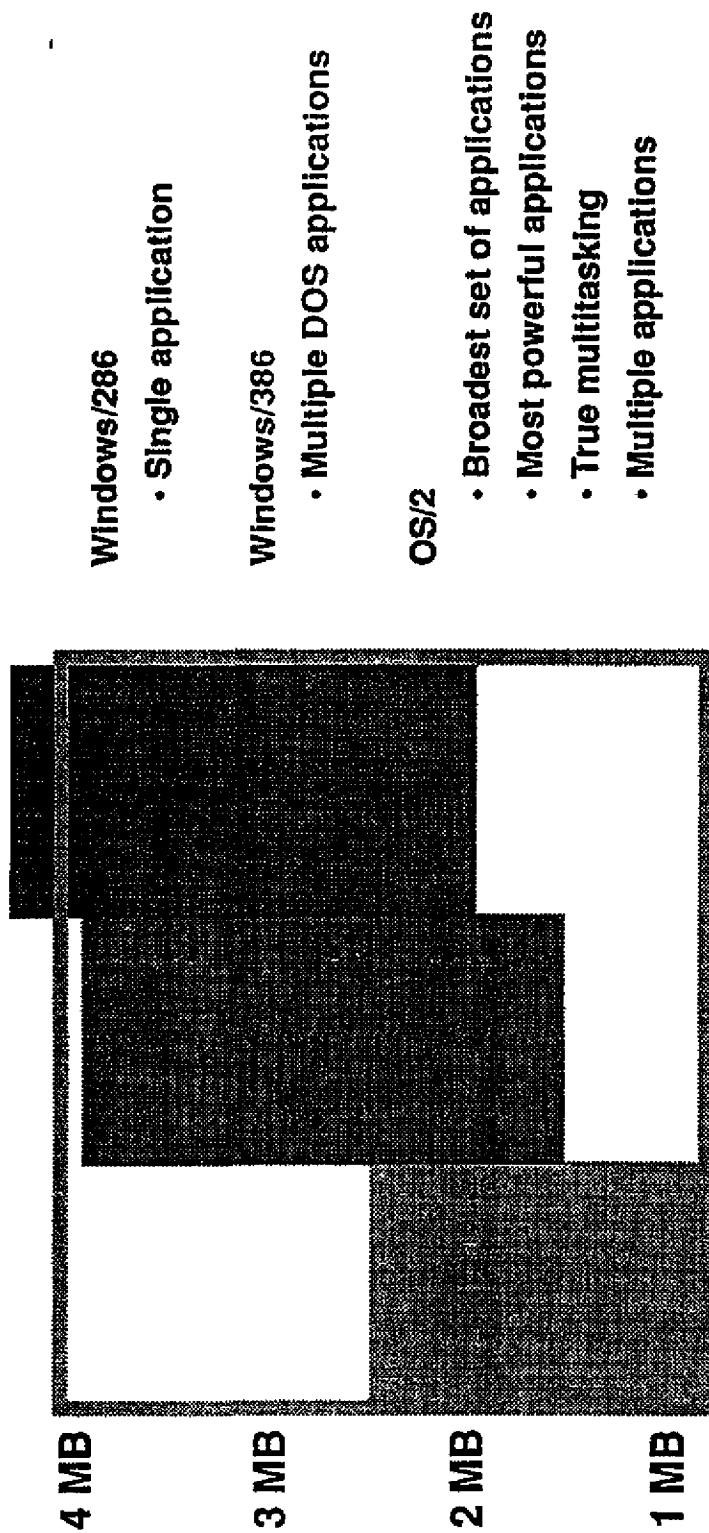
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Expected Memory And User Types



Windows/286

- Single application

Windows/386

- Multiple DOS applications

OS/2

- Broadest set of applications
- Most powerful applications
- True multitasking
- Multiple applications

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OS/2

**The Most Powerful
Graphical User Interface System**

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OS/2 Success Factors

- Critical mass of binary compatible installations
- Microsoft and IBM commitment to the product
- Technical strength

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Microsoft and IBM Commitment

- Identical OS/2 version 1.0 and 1.1 products
- Open architecture
- Programmatic interface

Device drivers

Fonts

Data Interchange protocols

- Refinement

Speed

Size

Useability

- Enhancement

New features

Hardware support

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OS/2 Technical Strength

- Pre-emptively scheduled kernel supporting multiple concurrent tasks and multiple threads of execution
- Advanced memory management and inter-process communication facilities
- Extensible system services via use of dynamic link libraries
- Integrated graphical user interface
- Advanced networking support

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OS/2 Momentum OEM Support

• 60 OEMs worldwide have licensed OS/2, including:

Alcatel, Apricot, AST, AT&T, Bull, Compaq, Dell, HP, IBM, NCR, NEC, Olivetti, Research Machines, SMT Goupil, Tandem, Tandon, Tandy, 3Com, Toshiba, Unisys, Wang, Wyse, Zenith.

• 6 OEMs are now shipping OS/2 1.1:

Bull, Compaq, IBM, NCR, Nokia, Zenith

• 9 or more OEMs will be shipping OS/2 1.1 in the next 90 days

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OS/2 Application Development Developer Programs

• MS OS/2 Software Development Kit program Total kits sold (International and domestic)	7,244
• OS/2 Seminar training	2,500
• Microsoft University classes	2947
• Registered OS/2 applications	1,000+
• OS/2 applications shipping now	362
• OS/2 1.1 based applications shipping now	4

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Key OS/2 1.0 Applications

Ashton-Tate	DBase IV	Q2 '89
Ashton-Tate/Microsoft	SQL Server	Q2 '89
Borland	Paradox	shipping
Lotus	1-2-3 ver. 3	Q2 '89
Microsoft	Word 5.0	shipping
Oracle	LAN Manager	shipping
WordPerfect	Oracle	shipping
	WordPerfect 5.0	shipping

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Major Vendors Supporting OS/2 1.1

Aldus	Micrografix
Ashton-Tate	Microrim
Autodesk	Microsoft
Blyth	Software Publishing
Borland	SPSS
Computer Associates	T/Maker
DataEase	Traveling Software
Digital Research	Ventura
Gupta Technologies	Versacad
Information Builders	Whitewater Group
Logitech	WordPerfect
Lotus Development	Z-Soft
MDBS	Zenographics

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OS/2 1.1 Device Drivers

Video

EGA	Shipping
VGA	Shipping
VGA+ (800x600 - Video 7)	Shipping
CGA	Shipping
8514	Shipping
Compaq Plasma	Shipping
TIGA	Shipping (Q3)

Printer

IBM 4201 (ProPrinter)	Shipping
Epson	Shipping
PostScript	June '89
HP-PCL	July '89
HP-PaintJet	(Q3)

Plotters

HP-GL	Shipping
IBM Plotters	Shipping

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OS/2:

**Momentum Is Better Than DOS At
Year One!**

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The future for OS/2

- File system improvements
- Support of 386 processor
- Imaging model
- Networking
- Object oriented enhancements
- Multi-processor support

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Microsoft Systems Software Timetable

- | | |
|------|-----------------------------------|
| 1987 | • OS/2 1.0, December 1987 |
| 1988 | • LAN Manager 1.0, September 1988 |
| 1989 | • OS/2 1.1, October 1988 |
| | • OS/2 1.2, Q3 1989 |
| | • Windows 3.0, Q4 1989 |
| | • OS/2 2.0 SDK, Q3 - 4 1989 |
| 1990 | • LAN Manager 2.0, Q3 1989 |
| | • OS/2 2.0, 1st half 1990 |

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OS/2 version 1.2

- Release scheduled third quarter 1989
- Completely compatible with OS/2 1.1
Superset of OS/2 1.1 APIs
OS/2 1.1 applications run unmodified
Major enhancements are in the file system
(Kernel, not PM)

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OS/2 1.2 File System Enhancements

Installable File System

- Support for non-FAT file systems to be installed in OS/2.
- IFS's can be configured as the default file system or as an optional file system.

Long File Names

- File names up to 254 characters.

Extended Attributes

- Provides the ability for an application to attach information to a directory or file which describes that directory or file to another application, the operating system, or the file system.

Examples: PM Icon type for documents, Owner name...

High Performance File System

- The new file system for OS/2 written as an IFS.
- Offers 2 to 10 times the performance over the DOS FAT file system.
- The HPFS is transparent to applications.

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OS/2 2.0 Overview

- Release scheduled first half of 1990
 - Pre-release software development kit available in 1989
 - Provides a 32-bit version of OS/2 for the 80386
 - Compatible with OS/2 1.1 and 1.2
- 16 bit OS/2 applications will run unmodified

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OS/2 2.0 Features

- 0:32 flat memory model
- Supports demand paging (4K page size)
- No 64K segment limitations
- 32-bit application program interfaces (APIs)
- 32-bit file system
- Multiple virtual 640Kb DOS machines
- Major shell enhancements

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Microsoft's Projected OS/2 1.1 Run Rate

- 1989 500,000 units
- 1990 1,000,000 to 2,000,000 units

Crossover with DOS in the office will
occur in late 1991 or early 1992

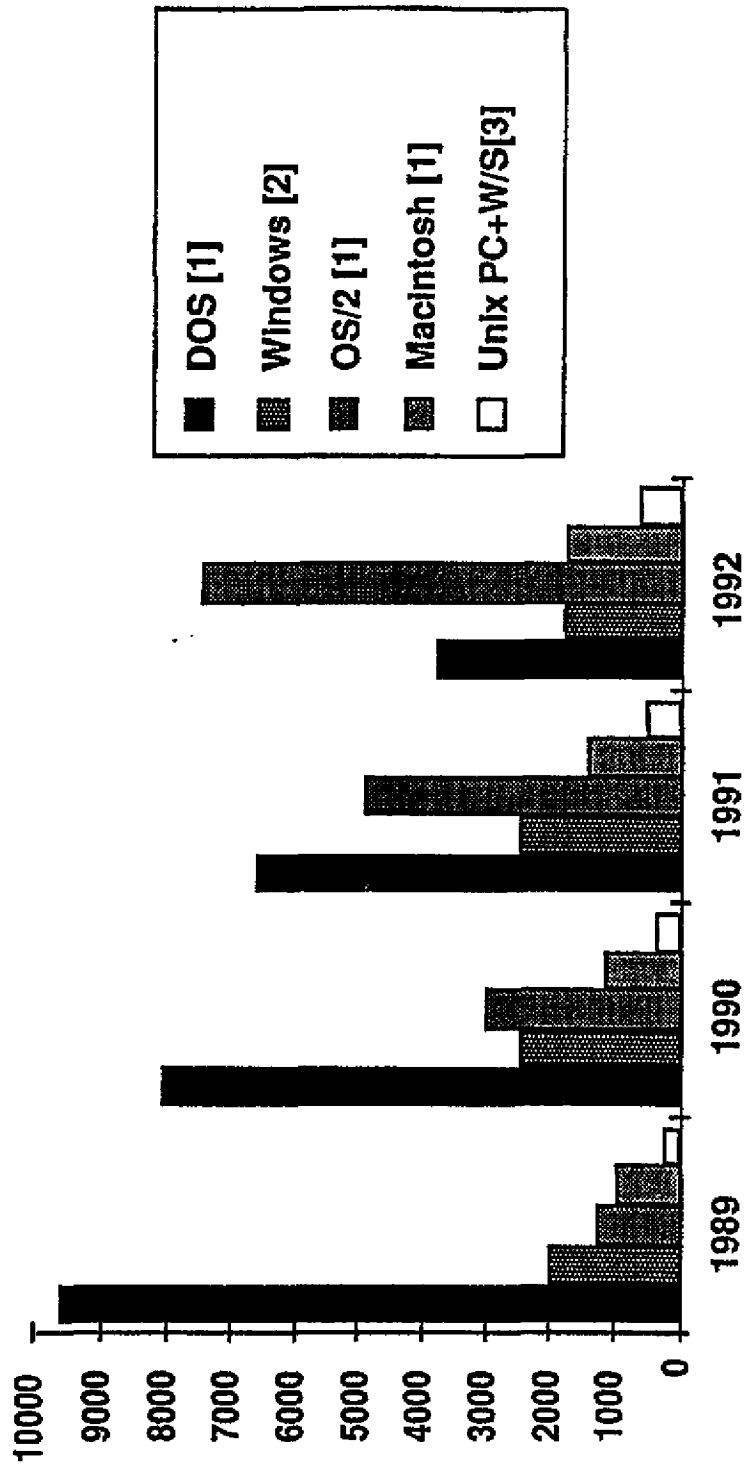
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OS/2 Projected Run Rate



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IDC [1], Gartner Group [2], Dataquest [3] CONFIDENTIAL **Microsoft**

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Microsoft OS/2 Support

- Technical Support
 - Microsoft University (MSU) classes
 - Microsoft OnLine support system
 - Special OS/2 Design Workshops
- Marketing Support
- What Else?

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Summary

- OS/2 has early critical momentum
- Planned enhancements will consistently improve end user and developer benefits
- OS/2 is the foundation for technology innovation

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Tall file cab,
Top drawer,
First thing in L Bin

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Personal Computers

In The '80s

- ◆ Spreadsheet, word processing, publishing tools
- ◆ Terminal emulation
- ◆ Same limited transaction processing, information access
- ◆ 60 million desktop machines (85% + MS-DOS)

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Networks In The '80s

- ◆ Shared disks, printers
- ◆ Centralized backup, application storage
- ◆ Some file sharing, file-based applications
- ◆ Limited mail, information sharing
 - Million servers
 - Million desktops

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Microsoft Vision

**A computer on
every desk and in
every home**

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PC Opportunity

- ◆ Downsize Applications
 - Cheaper MIPS
 - Richer presentation

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PC Opportunity

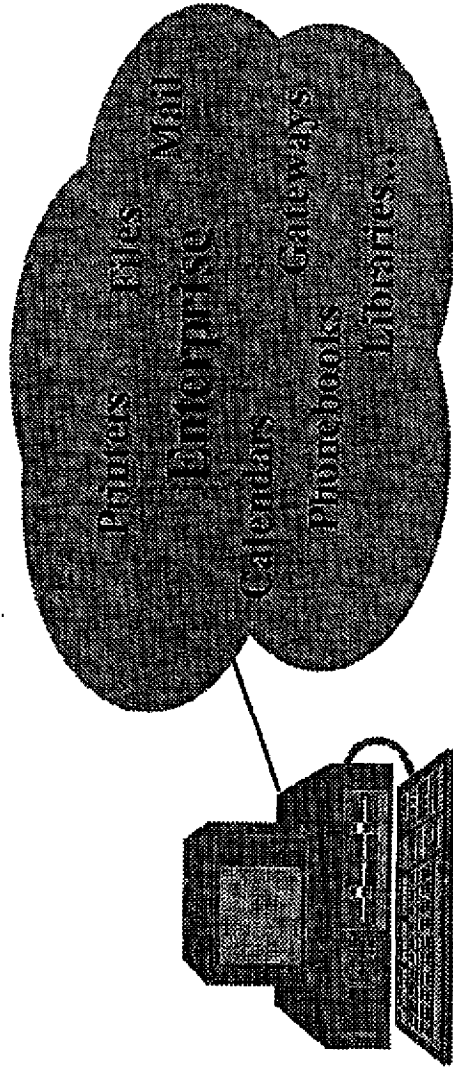
- ◆ **Information Access**
 - Most generic applications
 - Increases utility of all PCs
 - Computers better than people

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Computer Systems In The '90s



"Information at your fingertips"
More than sharing disks and printers

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Information At Your Fingertips:

What Is It?

- ◆ File, retrieve, and browse information more automatically than you can today
- ◆ Integrate different kinds of information together seamlessly
 - Specifically locally and remotely stored data
- ◆ Software maintains information dependencies and constraints
- ◆ Automate use and business-specific procedures

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Information At Your Fingertips:

Examples

- ◆ **Seamless access to information regardless of data location on network:**
 - "Find all information about my last trip to Europe"
- ◆ **Better communication with others on network:**
 - "Send this e-mail message with high urgency to all members of the accounting group"
- ◆ **Harness power of network:**
 - "Find a PC on the network with free CPU cycles, recalc this spreadsheet on it, and return the result to me"

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Requirements For Information At Your Fingertips

- ◆ Graphical operating systems with integrated information browsing
- ◆ A PC server operating system that is standard and has minicomputer capability
- ◆ A wide array of server applications (including file and print service)
- ◆ Efficient and powerful administration tools
- ◆ High performance, reliable network software with connectivity to other PC networking systems
- ◆ Access to data stored on non-PC systems
- ◆ Client applications that exploit this model

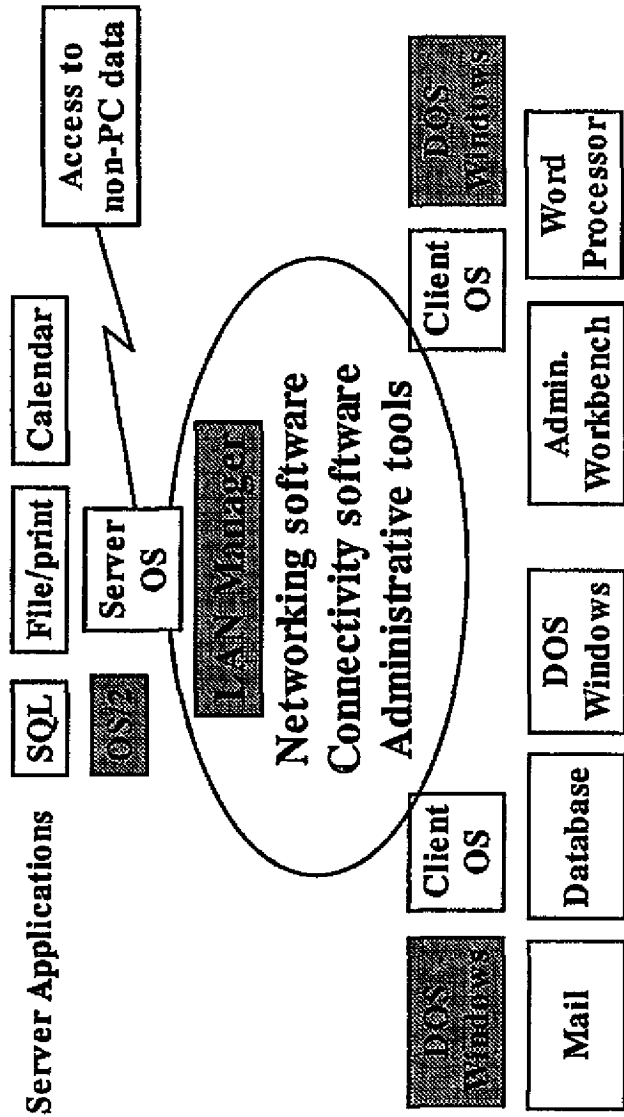
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Information At Your Fingertips

A Picture



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Requirements For Information At Your Fingertips

- ◆ Long-term R&D investments
- ◆ Industry support and effort
- ◆ Strategic emphasis on service and support

Commitment

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Why Microsoft?

Microsoft: A company of vision/patience

1980s successful crusades

- ◆ **The MS-DOS binary standard**
- ◆ **The Windows graphical user interface**

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Why Microsoft?

Requires Integrated Approach

Client OS	Microsoft	?
Server OS	Microsoft	UNIX
Server applications (ind. file/print)	Microsoft	?
Administrative tools	Banyan	Microsoft, Novell
Connectivity/Networking software	Novell	Microsoft
Access to non-PC data	Microsoft	Oracle

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Why Microsoft?

Requires open approach, partnership

- ◆ Evangelism of ISVs
 - Lotus, Oracle, Novell, WordPerfect, etc.
- ◆ Open design
- ◆ Partnerships with key hardware vendors
 - IBM, Compaq, AT&T, DEC, H-P, etc.

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Microsoft And IBM

- ◆ **A healthy, long-term relationship**
- ◆ **To improve development efficiency:**
 - DOS, Windows, OS/2 3.x at Microsoft
 - OS/2 1.x and 2.x at IBM
 - MS maintains a significant role in OS/2 1.x and 2.x
- ◆ **All products are fully cross-licensed**
- ◆ **LAN Manager and LAN Server converge**
- ◆ **IBM provides Data Manager, Comm Manager as unbundled client/server applications**

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Novell's Future

- ◆ **Focus:** PC file/print sharing
Build WIN/own? technology
Good products
- ◆ **Vision:** Unclear
Role of client/server
applications?
Integrated information access?
Independent vision?

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Timeline

	1991	1992	1993
DOS	DOS 5.0	DOS 6.0	DOS 6.1
OS/2	Windows Libraries OS/2 2.0 OS/2 3.0 SDK	OS/2 3.0 Server	OS/2 3.0 cl
Windows	Windows 3.1 Pen Extensions Multimedia Extensions	Windows 3.2 Net Extensions	Window 4.0
LAN Manager	Lan Manager 2.1 TCP/IP	Lan Manager 3.0	LAN Manager 4.0
	Dial-in Server Net Management Agents		

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MS-DOS: The Foundation

- ◆ Installed base of more than 50 million users
 - Wide choice of hardware
 - Single binary standard for software
- ◆ 1991
 - DOS v. 5.0 replaces MS-DOS v. 3.3/4.0
 - Focus on memory utilization, user-oriented features, easy upgrade
 - Aggressive retail upgrade program from Microsoft

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Microsoft Windows Phases

- ◆ Refine
- ◆ Extend
- ◆ Improved operating system support
- ◆ Enhance

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Microsoft Windows v. 3.0

Red Hot!!

- ◆ 1,000,000 Retail copies in 3 months
- ◆ 50 OEM licenses
- ◆ 20,000 Software Development Kits
- ◆ 1,000 Compatible applications

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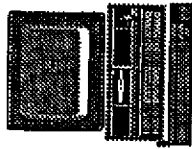
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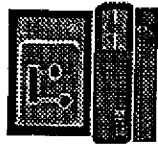
Windows Everywhere



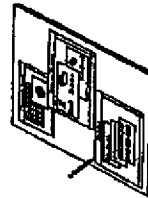
- ◆ Portable
- ◆ ROM-able



- ◆ Networking Extensions
- ◆ Connectivity Extensions



- ◆ CD-ROM
- ◆ Multimedia



- ◆ Handwriting Support

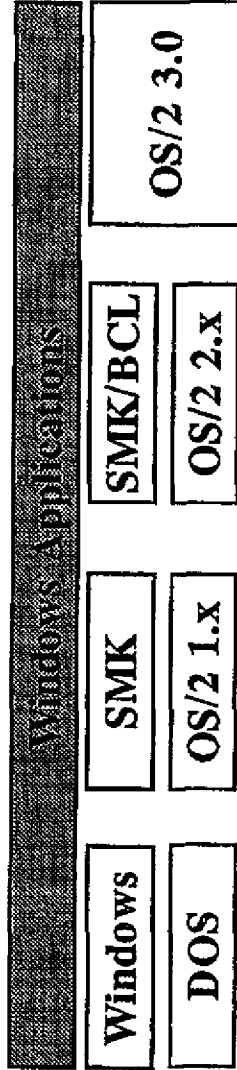
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DOS And OS/2

- ◆ New approach: family, not replacement strategy
- ◆ Software Migration Kit (SMK) allows developers to package Windows applications for OS/2 1.x & 2.x
- ◆ Binary Compatibility Layer (BCL) allows users to run Windows applications protect mode binary on OS/2 v. 2.x



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Windows: The Next Generation

- ◆ **Compound documents**
- ◆ **Data storage**
- ◆ **Object-oriented shell**
- ◆ **External macro programming**

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OS/2

1.X	2.X	3.X
80286 and up	80386 and up	80386 and up
Preemptive MT	Preemptive MT	Preemptive MT
Protection	Protection	Protection
Segmented Memory	Paged Memory	Paged Memory
Network Server	Network Server	Network Server
DOS apps	DOS apps	DOS apps
Mission-critical apps	Windows Libraries	Windows native
	Mission-critical apps	Mission-critical apps
		POSIX apps
		Security
		Multiprocessor support
		Portable

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LAN Manager V. 2.1

- ◆ Refine version 2.0
- ◆ Improve connectivity
- ◆ OS/2 remains primary server operating system
- ◆ Upgrade LAN Manager for UNIX

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LAN Manager V. 3.0

- ◆ Focus on world-class administration
- ◆ Use graphical user interface for administration
- ◆ Take advantage of networking extensions for Windows for better administration
- ◆ Provide servers for all integrated Windows client features
- ◆ Migrate to OS/2 version 3.0 on server

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LAN Manager V. 4.0

- ◆ Align with Windows
version 4.0

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