

Windows 95 Feature Review

Microsoft® Windows® 95

Preview Program

**Microsoft
Corporation**

This is a preliminary document and may be changed substantially prior to final commercial release. This document is provided for informational purposes only and Microsoft Corporation makes no warranties, either express or implied, in this document. The entire risk of the use or the results of the use of this document remains with the user. Companies, names, and data used in examples herein are fictitious unless otherwise noted. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of Microsoft Corporation.

Adaptec is a trademark of Adaptec Inc. Adobe is a registered trademark of Adobe Systems, Inc. AT&T is a registered trademark of American Telephone and Telegraph Company. Apple, Macintosh, and TrueType are registered trademarks of Apple Computer, Inc. Artisoft and LANtastic are registered trademarks of Artisoft, Inc. Banyan and VINES are registered trademarks of Banyan Systems, Inc. Quattro Pro is a trademark of Borland International, Inc. COMPAQ and Qvision are registered trademarks of Compaq Computer Corporation. Compuserve is a registered trademark of Compuserve, Inc. Clipper is a trademark of Computer Associates International, Inc. CorelDRAW is a registered trademark of Corel Systems Corporation. Alpha AXP, DEC, and PATHWORKS are trademarks of Digital Equipment Corporation. TrueSpeech is a trademark of DSP Group, Inc. GENie is a trademark of General Electric Corporation. Kodak is a registered trademark of Eastman Kodak Company. Future Domain is a registered trademark of Future Domain Corporation. LaserJet is a registered trademark of Hewlett-Packard Company. Doom is a trademark of ID Software. Intel is a registered trademark and i386, i486, Indeo, and Pentium are trademarks of Intel Corporation. IBM is a registered trademark, and C/2 and PowerPC are trademarks of International Business Machines Corporation. Toshiba is a registered trademark of Kabushiki Kaisha Toshiba. 1-2-3, Freelance, Lotus, and Lotus Notes are registered trademarks of Lotus Development Corporation. Microsoft, MS-DOS, Windows, and Win32 are registered trademarks, and Windows NT is a trademark of Microsoft Corporation. MIPS is a registered trademark of MIPS Computer Systems, Inc. Netware and Novell are registered trademarks of Novell, Inc. UNIX is a registered trademark of Novell, Inc. in the U.S.A. and other countries, licensed exclusively through X/Open Company, Ltd. Prodigy is a trademark of Prodigy Services Company. America Online is a registered trademark of Quantum Computer Services, Inc. Shiva is a registered trademark of Shiva Microsystems Corporation. Silicon Graphics is a registered trademark of Silicon Graphics, Inc. Sun is a registered trademark of Sun Microsystems, Incorporated. Western Digital is a trademark of Western Digital Corporation. WordPerfect is a registered trademark of WordPerfect Corporation.

The information contained in this document represents the current view of Microsoft Corporation on the issues discussed as of the date of publication. Because Microsoft must respond to change in market conditions, it should not be interpreted to be a commitment on the part of Microsoft and Microsoft cannot guarantee the accuracy of any information presented after the date of publication.

Copyright © 1995 Microsoft Corporation. All Rights Reserved.

Document No. WI60285-0395
Printed in the United States of America.

Contents

Chapter 1 Windows 95 Product Review 1

Windows 95 Product Areas Covered by Guide 2

Summary of Improvements over Windows 3.1 3

Try It! 3

Chapter 2 The Windows 95 User Interface 5

Designing the User Interface in Windows 95 6

Objectives 6

Methodology 6

Improving Windows 3.1 6

Putting New Designs to the Test 8

Easy 8

The Desktop: Neat, Clean, and Logical 9

The Taskbar: Home Base 10

The Start Button: Up and Running in Seconds 10

Task Switching Made Simple from the Taskbar 12

Name Files Using Long Filenames 15

Network Neighborhood and Accessing Networking Features 16

Recycle Bin: Easily Delete/Undelete Files 18

More “Document-centric” 18

Undoing File Operations 19

New Help Engine: Accessible and Useful Online Information 20

Wizards: Your Guide to Powerful Capabilities 22

Powerful 23

Windows Explorer: File Management and Information Browsing 23

Shortcuts 25

Properties Everywhere 26

Right-Clicking Everywhere 28

Control Panel: The Consolidated Control Center 29

Find Files or Folders: Easily Locate Information 32

Printers Folder: Consolidated Printer Control 33

Font Settings: More Powerful Font Management and Preview 34

Quick Viewing of Files 35

Transition/Migration to the Windows 95 User Interface	36
Compatibility	37
For Users of Windows 3.1	38
For Users of MS-DOS	38

Chapter 3 Base System Architecture 39

Summary of Improvements over Windows 3.1	40
Fully-Integrated Operating System	40
A Preemptive Multitasking Operating System	41
No Need for CONFIG.SYS or AUTOEXEC.BAT	43
MS-DOS Not Really There?	43
32-Bit Versus 16-Bit Components	44
Virtual Device Drivers—What is a VxD?	45
Layout of System Architecture for Windows 95	47
Support for Win16-based Applications	48
Compatibility	48
Size	49
Performance	50
Protection	50
Robustness Improvements	51
Support for MS-DOS-based Applications	51
Protection	52
Robustness Improvements	52
Improved Support for Running MS-DOS-based Applications	52
Support for Win32-based Applications	52
Preemptive Multitasking	53
Separate Message Queues	53
Flat Address Space	54
Compatibility with Windows NT	54
Long Filename Support	54
Memory Protection	55
Robustness Improvements	55

32-Bit File System Architecture	56
Architecture Overview	57
Installable File System Manager	58
32-bit File Access—Protected-mode FAT (VFAT) File System	59
32-Bit CDFS—Protected-mode CD-ROM File System	61
Disk Device Architecture—Block I/O Subsystem	61
Long Filename Support	64
Additional File Date/Time Attributes	66
Coordinated Universal Time (UTC) Format	66
Exclusive Volume Access For File Recover Tools	67
DriveSpace Disk Compression	68
Improved System Capacity	69
System Resource Limitation Improved	70
Better Memory Management	72
Linear Memory Addressing for Win32-based Applications	72
Compatible with the Memory Model used by Windows NT	72
Improved Virtual Memory Support—Swapfile Improvements	72
The Registry—Centralized Configuration Store	74
Problems with Windows 3.1 .INI Files	74
Solution to Windows 3.1 .INI File Problems	75
.INI Files Still Exist for Compatibility Reasons	76
Role in Plug and Play	76
Remote Access to Registry Information	77
Better Font Support	77
32-bit TrueType Rasterizer	77
Chapter 4 Robustness Improvements	79
System-wide Robustness Improvements	79
Better Local Reboot	80
Virtual Device Driver Thread Clean-up When a Process Ends	81
Per-Thread State Tracking	81
Virtual Device Driver Parameter Validation	82

Robustness for MS-DOS–based Applications	82
Improved Protection for Virtual Machines	82
Better Cleanup When a Virtual Machine Ends	83
Robustness for Win16–based Applications	83
Per-Thread State Tracking	84
Parameter Validation for Win16 APIs	85
Robustness for Win32–based Applications	86
Each Win32–based Application Runs in its own Private Address Space	86
Parameter Validation for Win32 APIs	86
Per-Thread Resource Tracking	87
Separate Message Queues for Win32–based Applications	87
Improved Local Reboot Effectiveness	89
Structured Exception Handling	89
Local Reboot	90

Chapter 5 Improved Support for Running MS-DOS–based Applications 91

Summary of Improvements over Windows 3.1	92
Zero Conventional Footprint Components	92
Improved Compatibility	94
Single MS-DOS Application Mode	95
Improved Support for Graphic-intensive MS-DOS–based Applications	95
Improved Memory Protection	96
Better Defaults for Running MS-DOS–based Applications	96
Consolidated Customization of MS-DOS–based Application Properties	97
Toolbar in MS-DOS Window	98
User-Scalable MS-DOS Window	100
Ending MS-DOS–based Applications Graceful	100
Local Virtual Machine Environment Settings	101
Support for UNC Pathnames to Access Network Resources	102
New MS-DOS Prompt Commands	103
Starting MS-DOS <i>and</i> Windows–based Applications	103
Support for Long File Names	103
Improved Support for Running MS-DOS–based Applications	104
More Free Conventional Memory	104
MS-DOS–based Application Property Sheets	104
Scalable MS-DOS Window	105
Launching Applications from the MS-DOS Command Prompt	105

Chapter 6 Plug and Play 107

- The Problem With PCs Today 108
 - Mobile Computers Demand Much Higher Flexibility 109
- The Plug and Play Solution 110
- Plug and Play Support in Windows 95 111
- Benefits of Plug and Play with Windows 95 113
- Hardware Design Guide for Microsoft Windows 95 114
- Device Manager 115

Chapter 7 Improved Device Support 117

- Device Driver Philosophy in Windows 95 118
- Better Disk Device Support 119
 - Support for IDE Drives and Controllers 120
 - Support for SCSI Devices and Controllers 121
 - Support for ESDI Controllers 121
 - High-Speed Floppy Disk Driver 121
- Better Display Adapter and Monitor Support 122
 - Summary of Improvements Over Windows 3.1 122
 - Improved Driver Stability and Reliability 123
 - Improved Video Display Performance 123
 - Support for More Video Display Adapters Than Windows 3.1 124
 - Robustness Improvements 124
 - New Control Panel Enhancements and Customization Properties 125
 - Image Color Matching Support 126
 - Energy Star Monitor Support 126
- Better Mouse and Pointing Device Support 128
 - Summary of Improvements over Windows 3.1 128
 - Improved Windows Mouse Driver 128
 - Mouse Control Panel Enhancements 129
- Try It! 130
 - Floppy Disk and Multitasking Performance 130
 - New Display Settings 130
 - Single Mouse Driver 130

Chapter 8 Networking 131

Summary of Improvements over Windows 3.1 and

Windows for Workgroups 3.11: 132

Easier networking with Windows 95 133

 Windows 95 Provides great Novell NetWare Integration 133

 Windows 95 is the “Well-Connected Client” Operating System 134

 Windows 95 Puts Information on the Internet Just a

 Mouse-Click Away 135

 Windows 95 Makes Using the Network as Easy as “Point and Click” 135

 Windows 95 Makes Mobile Network Support Easier 136

 Windows 95 Client: Designed for Manageability 137

Network Architecture in Windows 95 140

Network Provider Interface: Concurrent Support for Multiple

Network Servers 141

Installable File System: Support for Multiple Network Redirectors 144

NDIS 3.1: Multiple Protocol Support 145

Novell NetWare Integration 146

 32-bit Microsoft Client for NetWare Networks 146

 Microsoft File and Printer Sharing for NetWare 148

 NetWare 4.x support 151

 Other NetWare Interoperability 151

Microsoft Network Integration 152

 32-bit Microsoft Client 152

 32-bit Microsoft Network Peer Services 153

Network Compatibility 154

Protocol Support 154

 IPX/SPX 155

 TCP/IP 155

 NetBEUI 157

Network Interprocess Communications Interfaces 158

Long Filename Support 158

Network Printing 158

Network Security 159

 Password Control: Unified Logon 160

 User-level Security 161

Dial-Up Server/Remote Access Gateway 163

Chapter 9 Systems Management 165

- The Registry 166
- User Management 170
 - User Profiles 171
 - System Policies 172
 - Registry Tools 175
 - Role of the Server in Systems Management 176
- System Management 177
 - Windows 95 Tools 178
 - Performance Monitoring 179
- Network Management 180
 - Server-based Backup 180
 - Network Management Tools 182
 - Windows 95 Tools 183

Chapter 10 Printing Improvements 185

- Summary of Improvements over Windows 3.1 186
- 32-bit Print Subsystem 186
 - 32-bit Preemptive Spooler 187
 - Enhanced Metafile Spooling 187
- Improved Printing Support for MS-DOS-based Applications 189
- Support for Deferred Printing 190
- Image Color Matching Support 190
- Installing and Configuring a Printer 192
 - Easy New Printer Setup 192
 - Configuring a Printer 194
- Managing Print Jobs 195
- Network Printing Improvements 196
- Plug and Play Support 197
 - Examples of Plug and Play-Compatible Printers 197
 - Quick Return to Application Time 198
 - Spooling from an MS-DOS-based Application 198
 - Plug and Play Support 198

Chapter 11 Communications 199

Summary of Improvements over Windows 3.1	199
Communications Architecture	200
Communication Goals of Windows 95	200
Kernel Improvements in Windows 95 Makes Communicating More Responsive	202
Driver Architecture	203
Telephony API (TAPI)	205
Better Sharing of Communication Devices Between Communication Applications and Services	207
Centralized Modem Setup and Configuration	208
Modem Configuration in Windows 3.1	208
Modem Configuration in Windows 95	209
Improved Device/Hardware Support	212
16550A UART FIFO Support	212
More Ports Supported	212
Support for Future Parallel Modems	212
Plug and Play Support	213
Modems	213
New Communications Application: HyperTerminal	214
New Communications Application: Dialer	215
Background Multitasking of Communications Applications	216
Power of the Telephony API	216

Chapter 12 Mobile Computing Services 217

Vision of Mobile Computing with Windows 95	217
Mobile Framework in Windows 95	218
Staying Connected	220
Dial-Up Networking	220
Telephony API	223
Unimodem	224
Dynamic Networking	224
Password Management	225

Moving To and From the Desk	225
Hot Docking Support	225
New Message Support	226
The Registry	226
PCMCIA Support	227
Power Management	227
Flexible Video Resolution Support	228
Pointing Devices	228
Dealing With the Mobile Environment	228
File Synchronization: The Briefcase	228
Microsoft Fax	230
“Local” Connections	230
Document Viewers	231
Deferred Printing	231
Remote Mail	231
Messaging API	232
Chapter 13 Microsoft Exchange: E-Mail, Faxes and More	233
Microsoft Exchange Highlights:	234
Windows Messaging Subsystem - MAPI 1.0	234
Open Architecture for Open Connectivity	235
Microsoft Exchange	237
Summary of Improvements over Current Microsoft Mail	238
Working in Microsoft Exchange	238
Rich Text Mail Messages	240
Saving Messages	241
Personal Address Book	241
Information Stores	242
Microsoft Mail drivers	244
Microsoft Mail Post Office	246
Microsoft Internet Mail drivers	246

Send and Receive Faxes from your Desktop	248
Fax at your Fingertips	250
Rich Messaging Capabilities	251
Workgroup Fax Features for MIS	252
Easy Access to Fax Information Services	253
Fax Viewer and Cover Page Designer	253
Secure Faxing with Encryption and Digital Signatures	254
Compatible with Popular Fax Modems and Fax Machines	255
Coexistence with Windows-based Telecommunications Applications	256
MAPI Integrates Fax with Applications	256

Chapter 14 The Microsoft Network - OnLine Service 257

Easy To Get Started	258
Easy To Use and Understand	258
The Microsoft Network Highlights	258
Shortcuts	258
Electronic Mail	258
Multitasking	259
World Wide Access	259
How To Get Started	259

Chapter 15 Multimedia Services 261

Microsoft Windows and Multimedia	262
A Little History	262
Windows 95—A New High-Performance Multimedia Platform	263
For consumers, Windows 95 makes multimedia easier, more fun, and more engaging.	264
For developers, Windows 95 offers a powerful platform for professional multimedia authoring	264
For hardware makers, Windows 95 offers exciting new opportunities	264
Making Multimedia Easier	265
Plug and Play Support	265
AutoPlay: Spin and Grin	265
Built-in Support for Digital Video	266
Built-in Support for Sound and MIDI	266
CD Player: Whistle while you work	267

Making Multimedia More Engaging	268
CD+ Support Built Into Windows 95	268
Bigger, Faster, Better-looking 32-bit Digital Video Playback	268
Multitasking and Threads: “We <i>Don’t</i> Interrupt This Program...”	269
Built-in Support for Fast CD-ROMs	270
MPEG-Hardware Support for TV-like Video from Your CD-ROM	270
Making Windows More Fun	271
Fast DIB Drawing	271
Built-in Joystick Support	272
Powerful Development Environment	272
Sound Compression for CD-quality Sound	272
Polymessage MIDI Support for Better Sound	273
Multitasking	273
Professional Quality	274
Capture and Compression of Bigger Digital Video	274
General MIDI: You Want a Trumpet, You Get a Trumpet!	274
Built-in Support for Multimedia Devices	274
Opportunities for IHVs and OEMs: Multimedia PCs for 1995	275
New Opportunities for Great-Sounding Audio	276
DCI: Taking Advantage of New Video Card Features	276
Multimedia Architecture	277
Multimedia Graphics Architecture	277
How Multimedia Data is Routed in Windows	279
Chapter 16 Installation and Setup of Windows 95	281
Summary of Improvements over Windows 3.1	282
Modular Setup Architecture	282
GUI-based Setup Program	283
Leveraging of Detection Code	283
Improved Customization	284
Improved Hardware Detection	284
Four Scenario Setup Options	284
Simplified Four-Phase Setup	285
Hardware Detection Phase	285
Configuration Questions Phase	286
Copying Files	286
Final System Configuration	286
Better Control Over Installed Components	286
Smart Recovery Mechanism for Setup	286
Built-in Verification of System Files	287

Network Setup Improvements	287
Network Installation Location Remembered	288
Batch Installation Support	289
Configuration Preserved When Upgrading from Windows or Windows for Workgroups	289
Chapter 17 International Language Support	291
Summary of Improvements over Windows 3.1	292
Benefits for Users	292
Benefits for Developers	293
Localization of the Windows 95 Operating System	294
International Language Issues	294
From the End-User's Perspective	294
From the Developers Perspective	295
International Language Support	295
Date and Time Formats	295
Sorting and Searching Support	296
Support for Different National Character Set Support, Keyboards, and Fonts	297
International Language Solution: Multilingual Content Support	297
What is Multilingual Content?	297
Switching Between Languages and Keyboards the Easy Way	298
Multilingual Extensions to the ChooseFont Dialog Box	299
Multilingual Support for Exchanging Information Via the ClipBoard	300
Win32 National Language Support APIs	301
Support for Multilingual Content	302
Chapter 18 Accessibility	303
Summary of Improvements Over Windows 3.1	304
General Accessibility Enhancement Features	305
Online Help	305
Controlling the Accessibility Features	305
Emergency Hotkeys	306
Accessibility TimeOut	306
Accessibility Status Indicator	306
Features for Users with Low Vision	307
Scaleable User Interface Elements	307
Customizable Mouse Pointer	307
High-Contrast Color Schemes	307
High-Contrast Mode	307

Features for Making Keyboard and Mouse Input Easier	308
StickyKeys	308
SlowKeys	308
RepeatKeys	308
BounceKeys	309
MouseKeys	309
ToggleKeys	310
Features for Users Who Are Hearing-Impaired	311
ShowSounds	311
SoundSentry	311
Support for Alternative Input Devices	311
SerialKeys	311
Support for Multiple Pointing Devices	311
Features for Software Developers	312
Accessibility Guidelines for Software Developers	312
Methods for Simulating Input	312
Chaining Display Drivers	312
New Common Controls	312
Don't Touch that Mouse	313
Try Typing With a Pencil	313
Support for MS-DOS-based Applications	313
Take a New Look	313

Chapter 19 Applications and Utilities 315

File Viewers	316
WordPad	318
Paint	319
Backup	320
HyperTerminal	321
New MS-DOS-based Edit.Com	323
Disk Utilities	324
Disk Defragmenter (Optimizer)	324
ScanDisk (Disk Checking and Repair Tool)	325

Chapter 20 What Makes A Great Application for Windows 95? 327

- The Win32 Application Programming Interface 328
 - User Benefits of Using Win32-based Applications 328
- OLE Functionality 329
 - The Solution for Application Integration 329
 - Features of OLE 329
 - Drag-and-Drop 330
 - Visual Editing 330
- Windows User Interface Style Guideline 4.0 332
- Support for Plug and Play Events 335
- Long Filename Support 336
- Consistent Setup Guidelines 337

Chapter 21 The Windows 95 Logo Program 339

- Availability of Windows 95-Based Products 340
- Licensing Criteria for Windows 95 Logo 340
 - For More Information 341

Index 343

Microsoft WinNews - Get The Latest Information on Microsoft Windows

Microsoft Windows 95 is continuing to evolve as we get closer to the released availability of the product. To help keep you informed of the latest information on Windows, Microsoft has created the WinNews information forum, which serves as an easily accessible electronic-distribution point for new white papers, press releases, and other pertinent documentation. If you have a modem or access to the Internet, you can always get up-to-the-minute information on Windows 95 direct from Microsoft on WinNews. Use the following electronic addresses to access further information:

On CompuServe®	GO WINNEWS
On the Internet	ftp.microsoft.com/peropsys/win_news
On the Worldwide Web	http://www.microsoft.com
On GEnie™	WINNEWS Download area in Windows RTC
On Prodigy™	Jumpword WINNEWS
On America Online®	Keyword WINNEWS
On The Microsoft Network	Computers and Software\Software Companies\Microsoft\Windows 95\WinNews

To subscribe to Microsoft's WINNEWS Electronic Newsletter, send e-mail to news@microsoft.nwnet.com with the words SUBSCRIBE WINNEWS in your message.