



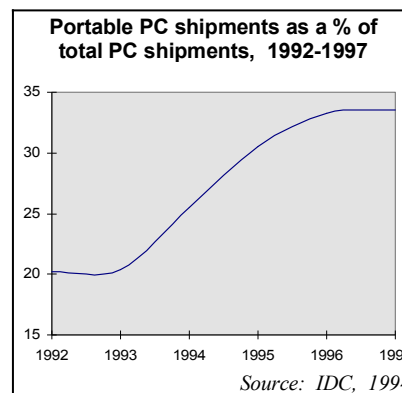
Mobile Computing

Windows® 95 Mobile Computing Design Goals

Microsoft®
Windows™ 95

Windows 95 is the first mainstream operating system designed with the Portable PC user in mind. The goal of mobile computing support in Windows 95 is to help everyone unlock the potential of portable PCs, by being aware of the special requirements and demands of mobile computing. By 1995, portable PCs (notebooks, laptops, etc.) are forecasted to comprise over 25% of all new computer systems sold – Windows 95 has been designed to reduce the costs of supporting portable PC users, and to make those users more productive when they're mobile. Windows 95's mobile computing support extends to more than just traditional portable PC users, however. As more and more companies experiment with telecommuting features like Dial Up Networking and remote fax and email will become increasingly important.

The explosion in portable PC sales prompted careful examination of the tasks that mobile computer users were doing with their machines, and what those machines looked like. The answers are interesting: mobile computer users are doing the same tasks away from the desk as they are in their offices. At the same time, the mobile computing environment is unique. Many assumptions about desktop computing do not hold true: mobile users usually have no direct network access, have a dynamic, ever-changing computer configuration, and face new problems like a limited power supply. These findings present something of a dichotomy: although the desktop computing environment and the mobile computing environment are radically different, the computing tasks that users want to accomplish are very much the same.



Major Feature Areas

Clearly, the scope of mobile computing extends far beyond emerging technologies like PDAs, wireless, or the Pen – it is about enabling users **today** to be as productive away from their desks as they are in their offices, and about making it easy and cost-effective to support these users. Windows 95 approaches mobile computing support in three ways: by **helping to get the most out of portable computing hardware** like notebook PCs; by **helping portable computer users stay in touch** through electronic mail, fax, and remote network access; and by **helping users stay organized while on the road** with features like the Briefcase and Deferred Printing.

- **Get the most out of your Portable Computer Hardware.** Windows 95 provides features that extend the life of existing portable computers, as well as new functionality that advances the state of the art when used with new portable PCs. Integrated disk compression dramatically increases the available storage on portable PCs. New APIs enable applications to be battery-aware. New 32-bit PCMCIA support eliminates the hassles currently associated with PCMCIA devices. Docking stations and port replicators are fully supported through the Plug and Play initiative – multiple-boot configuration schemes are a thing of the past.
- **Keep in Touch.** Windows 95 includes completely redesigned remote network access, electronic mail, and fax features. Using Dial-Up Networking in Windows 95, you can connect to any Windows NT server, NetWare Connect server, Shiva NetModem or LanRover, many Internet service providers and Unix servers, and many other types of machines. Dial-Up networking in Windows 95 works the same way as networking over a physical cable (except for speed, of course). The Microsoft Exchange client gives you the ability to send and receive electronic mail and faxes while on the road. You can retrieve all of your new messages and fax documents into one “universal inbox,” as well as work very efficiently with electronic mail servers via Header Download and other optimizations.
- **Stay Organized while on the Road.** Windows 95 includes new features that enable users of portable computers to stay organized when they travel. The Briefcase takes care of file synchronization problems: simply copy files from your desktop PC or network into the Briefcase, and Windows 95 takes care of keeping all of your information up to date. Deferred Printing support manages print jobs you create while on the road, and Direct Cable Connect makes it easy to exchange files between two PCs.

To the greatest extent possible, Windows 95 provides all the ease-of-use, power, and “connectedness” of a desktop PC, even though the computer in question may be far away from a desk: in the next city, on the other coast, or 30,000 feet in the air! On the bottom line, customers enjoy increased mobile user productivity and dramatically reduced support costs.

Get the Most out of your Portable PC Hardware

<i>Battery Monitor</i>	Most new portable computers support Advanced Power Management (APM) Version 1.1. Windows 95 fully supports APM 1.1, and provides a visual indication of the system's power status, right on the task bar.
<i>Power Management APIs</i>	Now applications can help conserve your portable PC's batteries. Windows 95 provides power management APIs which make the information provided by APM 1.1 available to applications. So now, programs can turn off disk-intensive background operations and make other adjustments to maximize battery life.
<i>Integrated Disk Compression</i>	Windows 95 includes the latest version of integrated DriveSpace disk compression. This proven technology, first introduced in MS-DOS 6.22, extends the useful life of portable computers that are running short of disk space. DriveSpace compression is completely transparent and fully integrated into the Windows 95 operating system. All you see is many extra megabytes of disk space!
<i>PCMCIA support</i>	Windows 95 includes state-of-the-art "hot swapping" support for all major PCMCIA cards and sockets. PCMCIA is supported as part of the Plug-and-Play technology built into the product, meaning that the system will automatically detect the cards and sockets available on the PC, and configure itself accordingly – even "on the fly". Real-mode drivers and card/socket services are a thing of the past.
<i>Hot Docking and Multiple Configurations</i>	One of the recent major technological advances in portable PCs is hot docking and "smart" docking stations. One of the major disadvantages of docking stations today is the hassle involved in inserting and removing the computer! To successfully implement a docking station, the user must manually create multiple-configuration startup files, and fully shut down and reboot the computer whenever it is going to be moved in to or out of the dock. Windows 95 eliminates both of these problems: the system automatically configures itself for docked and un-docked configurations, and (with proper hardware support) can switch between them without rebooting or suspending the machine.
<i>"Soft Suspend"</i>	Many notebook computers feature "suspend" modes that enable the computer to run in a very low power mode for extended periods of time. On most machines, invoking suspend mode involves manually manipulating some small button on the computer's case. Windows 95 replaces this with an option on the Start menu, and adds support for powering down and resetting peripheral devices as part of the suspend cycle.
<i>File Viewers</i>	Mobile computer users may not have the disk space or processor power to run all the same applications that they (or their co-workers) run on their desktop machines. Windows 95 provides a set of viewers for many popular application file formats. The viewers enable users to examine files that they've received in email or downloaded from the network without having the source application installed on their machine.

Keep in Touch

<i>Remote Access Wizard</i>	Simplifies the process of setting up a connection to a remote computer or network. The Remote Access Wizard asks for the appropriate communications device, telephone number, and other connection information, then handles the process of dialing and connecting to the remote computer. Connections can be saved and re-established with a simple double-click.
<i>Microsoft At Work™ Fax Support</i>	Microsoft At Work Fax support integrates the ability to send and receive faxes into the Microsoft Exchange client included with Windows 95. Instead of learning how to use a separate fax utility, users can send fax documents in the same way that they send an email message. The At Work subsystem takes care of rendering the document and interacting with the fax modem.
<i>Remote Mail</i>	Electronic mail has not adapted well to the mobile environment. Most electronic mail packages expect a fast, persistent connection to the network postoffice. The "Remote Mail" packages available today require a proprietary protocol, and work with only one mail system. The Microsoft Exchange client in Windows 95 includes extended functionality to support mobile users. Remote Mail will implicitly create a network connection using Remote Network Access. Users can download just the headers for new messages, select the items they wish to read, and then retrieve only the requested data.
<i>Implicit Connections</i>	If the system cannot access a requested network resource (such as a file folder) because no physical network connection exists, it will automatically establish a remote network access connection. All the user needs to do is supply a password.
<i>Multiple protocol support</i>	Windows 95 uses PPP (Point-to-Point Protocol) as its default protocol for remote network access. This industry-standard protocol enables access to a wide variety of systems, including Windows NT servers, other Windows 95 machines, and the Internet. Windows 95 also supports the NetWare Connect protocol, SLIP (Serial Line Internet Protocol), and Windows for Workgroups-style RAS (remote access service) protocol.
<i>Unimodem drivers</i>	Windows 95 includes a "universal" modem driver, which offers base-level support for virtually all popular modems (modem vendors can add a hardware-specific driver layer to take advantages of the special features of their devices). The Unimodem architecture greatly enhances the quality and ease of development of new modem drivers.
<i>Improved serial port drivers</i>	Enhancements to the core of Windows 95 enable the system to handle much higher serial-line data rates. Windows 95 will easily keep pace as advancements in modems, ISDN, and other technologies push data rates to 28.8kbps and beyond.

Stay Organized on the Road

<i>Briefcase</i>	One of the problems unique to mobile computing is file synchronization. The typical scenario is: the user copies some files from the network server onto their portable, takes the portable on the road and edits the files, then, upon reconnecting to the network, manually compares the file time stamps on their local machine to those on the server to determine which files are current. This process is tedious and error prone – and often results in multiple conflicting versions of documents. The Briefcase in Windows 95 solves these problems. Files added to the briefcase on a mobile computer automatically maintain their association with the original files on a desktop computer or network. When re-connecting to the network or desktop PC, the briefcase automatically figures out which files are the most current, and brings everything up-to-date.
<i>Deferred Printing</i>	Few mobile computer users carry a printer when they travel. If output is desired, options are few (sending a fax to yourself or using a sticky note to remember which files to print are common solutions). Windows 95 provides deferred printing. Go ahead and create print jobs as you normally do. If no printer is available at the moment, Windows 95 stores your output, and automatically prints it the next time you have access to a printer. This is a great example of how Windows 95 creates a desktop-like environment in a mobile setting.
<i>Direct Cable Connect</i>	Nearly 75% of all portable PC owners also use a desktop PC. Transferring files between one's desktop machine and one's portable has often involved purchasing a costly network card for the portable, or else using an overly complex utility to transfer files via a serial or parallel cable. Windows 95's Direct Cable Connect (DCC) utility simplifies the file transfer process by providing a simple, integrated interface for connecting the two machines. DCC even enables a portable to access the network via using the desktop PC.