Mobile Computing

Design Goals for Windows 95 Mobile Computing
Fact Sheet

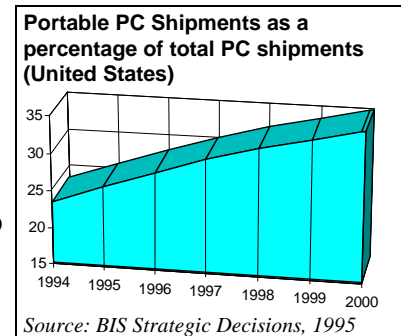**For More Information, Contact:**

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Overview

The Microsoft® Windows® 95 operating system is the first version of the Windows operating system designed with the portable PC user in mind. Mobile computing support in Windows 95 is designed to make portable and remote PC users more productive and to help reduce the costs of supporting these users. Portable PCs (notebooks, laptops, etc.) constitute nearly 25 percent of all new PC systems sold, and analysts predict that this proportion will continue to grow (according to BIS Strategic Decisions, 1995). Mobile computing is becoming a larger and more significant part of the PC market, and customers demand robust mobile support as part of their mainstream operating system.

The steady growth in sales of portable PCs led the designers of Windows 95 to carefully examine the ways in which mobile customers used their machines, and the configurations of those machines. What Microsoft found is that customers use their portable machines for the same tasks they use a traditional desktop machine for (word processing, spreadsheets, electronic mail, and so on). However, although the computing tasks that users want to accomplish are very much the same, the desktop computing environment and the mobile computing environment are radically different. Key differences include the lack of direct network access; dynamic, ever-changing computer configurations; and problems such as limited power supply. Portable PC customers also use a broader variety of hardware, including PC Card devices, docking hardware and infrared ports.

Portable PC Shipments as a percentage of total PC shipments (United States)

Source: BIS Strategic Decisions, 1995

Major Feature Areas

The scope of mobile computing extends far beyond emerging technologies such as PDAs, wireless communications, or pen-based computing — mobile computing is about enabling users **today** to be as productive away from their desks as they are in their offices, and about making those users easy and cost-effective to support. Windows 95 delivers mobile computing support in three ways: by helping users to get the most out of mobile computing hardware such as notebook PCs; helping portable computer users stay in touch through electronic mail, fax and remote network access; and helping users keep information organized with features like the Briefcase, Deferred Printing and Direct Cable Connect.

- **Get the most out of portable computer hardware.** Windows 95 provides features that extend the life of existing portable computers, as well as new functionality that advances the capabilities of new portable PCs. New application programming interfaces (APIs) enable applications to be battery-aware. New 32-bit PC Card support eliminates the hassles currently associated with PC Card 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. Integrated disk compression dramatically increases the available storage on portable PCs.

- **Stay in touch.** Windows 95 includes completely redesigned remote network access, electronic mail and fax features. Using Dial-Up Networking in Windows 95, users can connect to any Windows NT™ operating system-based 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). The Microsoft Exchange client gives users the ability to send and receive electronic mail and faxes while on the road. New messages and fax documents can be retrieved into one "universal inbox," as well as work very efficiently with electronic mail servers via built-in remote mail functionality and other optimizations.

- **Keep Information organized.** 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: Users can simply copy files from a desktop PC or network into the Briefcase, and Windows 95 takes care of keeping all of the information up to date. Deferred Printing support manages print jobs users 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 offers portable and remote PC users all the ease of use, power and "connectedness" of a desktop PC. Even though their computers may be far away from a desk — in the next city, on the other coast, or 30,000 feet in the air — mobile customers enjoy increased productivity and dramatically reduced support costs.

Key Features and Benefits

Get the Most Out of Portable Computer Hardware

- **PC Card support.** Windows 95 includes state-of-the-art hot-swapping and automatic-installation support for PC Cards and sockets. PC Card hardware is supported through Plug and Play, meaning that the system will automatically detect the cards and sockets available on the PC and configure itself accordingly — even on the fly. Built-in support for the top eleven PC Card chip sets provides compatibility with hundreds of PC Card devices.

- **Advanced power-management support.** Most new portable computers support advanced power management (APM). Windows 95 fully supports APM version 1.1 and provides a visual indication of the system's power status right on the taskbar. Windows 95 provides power-management APIs that make the information provided by APM 1.1 available to applications. Now, applications can help conserve portable PC batteries by turning off disk-intensive background operations and making other adjustments to maximize battery life. Windows 95 makes built-in power-management hardware easier to use by supplementing external "suspend" buttons with an option on the Start menu, and by powering down and resetting peripheral devices as part of the suspend cycle.

- **Hot docking and multiple configurations.** A recent major advance in portable PC technology is hot docking and "smart" docking stations. One of the current disadvantages of docking stations and port replicators is the hassle involved in inserting and removing the computer. To support docking hardware, the user must create multiple-configuration startup files manually, and shut down and reboot the computer fully whenever the configuration changes. Windows 95 eliminates both of these problems: The system automatically adapts to docked and undocked configurations and (with proper hardware support) can even switch between them without rebooting.

- **Infrared support.** Infrared (IR) support enables computers and peripherals to communicate via infrared light. Infrared communications represents a major advance in portable PC technology, since it supports the ad-hoc nature of many mobile computing activities. For example, the user of an infrared-equipped portable PC can simply walk up to an IR printer and print. Support for IR in Windows 95 complies with IrDA (Infrared Data Association) standards, so a Windows 95-based PC will be able to communicate with any other IrDA-compliant device. The infrared-driver architecture can emulate traditional parallel and serial ports for backward compatibility with existing software.

- **Integrated disk compression.** Windows 95 includes the latest version of the integrated DriveSpace™ disk compression utility. This proven technology, first introduced in the MS-DOS® operating system version 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 the user sees is many extra megabytes of disk space.

- **File viewers.** Mobile computer users may not have the disk space or processor power to run the same applications that they (or their co-workers) run on their desktop machines. Windows 95 provides viewers for many popular application file formats, thus enabling users to examine files that they've received in e-mail or downloaded from the network, without running the full application on their machine.

Keep In Touch

- **"New Connection" Wizard.** Windows 95 dramatically simplifies the process of setting up a connection to a remote computer or network. The New Connection Wizard asks for the appropriate communications device, telephone number, and other
connection information, then handles the process of setting up a Dial-Up Networking connection definition. Connections are saved and can be activated with a simple double-click.

- **Dial Helper.** Dial Helper enables users to define phone numbers in a location-independent fashion. Given an area code and phone number, the Dial Helper applies location-specific parameters to the number, such as a prefix to get an outside line, long-distance call prefixes, or international dialing codes. When the same number is dialed from a different location, Dial Helper automatically adjusts the prefixes, area

codes and other parameters. Dial Helper's database contains information on virtually all telephone systems around the world.

- **Remote mail.** Electronic mail has not adapted well to the mobile environment. Most electronic mail packages require a fast, persistent connection to the network postoffice. Remote-mail packages available today require a proprietary protocol and work with only one mail system. The Windows 95 Inbox includes functionality to support mobile users. The Inbox can implicitly create a network connection using Dial-Up Networking, and users can download headers for new messages, select the items they wish to read, and then retrieve only the requested information. The remote mail features are compatible with any MAPI-compliant mail system.

- **Fax support.** Microsoft 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 e-mail message. The Microsoft At Work subsystem takes care of rendering the document and interacting with the fax modem.

- **Multiple protocol support**. Windows 95 uses point-to-point protocol (PPP) as its default protocol for remote network access. This industry-standard protocol enables access to a wide variety of systems, including Windows NT 3.5-based servers, other Windows 95-compatible machines and the Internet. Windows 95 also supports the NetWare Connect and Windows® for Workgroups and Windows NT 3.1 remote access service (RAS) protocols.

- **Scripting.** Microsoft is developing a script engine for Windows 95 Dial-Up Networking. Many serial line IP (SLIP) and PPP dial-up servers require some interaction with the user while a connection is being set up. The script engine can automate tasks such as connecting to a UNIX shell account and launching SLIP (including parsing out an IP address), connecting via an X.25 pad, or connecting through a security device.

- **Implicit connections.** If the system cannot access a requested network resource (such as a file folder) because no physical network connection exists, it will automatically (at the user's option) establish a Dial-Up Networking connection. All the user must do is supply a password and modem.

- **UniModem drivers.** 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 advantage of the special features of their devices). The UniModem architecture greatly enhances the quality and ease of development of new modem drivers.

Stay Organized

- **Briefcase.** One of the problems unique to mobile computing is file synchronization. Typically, a mobile user will copy files from a network server onto a portable PC, edit the files while off the network, and then, upon reconnecting to the network,

manually compare file time stamps to determine which files are current. This process is tedious and error prone, and often results in multiple conflicting versions of documents. In Windows 95, files copied to the Briefcase automatically maintain their association with the original files on a desktop computer or network. When connected to the network or desktop PC, the Briefcase updates all files to the most recent version.

- **Deferred Printing.** Few mobile computer users carry a printer when they travel. If output is desired, options are few (sending a fax to oneself or using a sticky note to remember which files to print are common solutions). Windows 95 provides deferred printing. If no printer is available when a print job is created, Windows 95 stores the output and automatically prints it the next time a printer is available. Deferred Printing is a great example of how Windows 95 creates a desktop-like environment in a mobile setting.

- **Direct Cable Connect**. More than half of all owners of portable PCs also use a desktop PC. Transferring files between a desktop machine and a portable has often involved purchasing a costly network card for the portable or else using a utility to transfer files via a serial or parallel cable. The Windows 95 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 using the desktop PC. Enhancements to the core of Windows 95 allow the system to keep pace easily as advancements in modems, ISDN, and new technologies such as infrared push data rates to 28.8Kbps, 4Mbps and beyond.

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Other Documents about Mobile Computing in Windows 95:

- *Mobile Computing with Windows 95.* A detailed look at the mobile computing feature set in Windows 95. This document is designed to assist reviewers and evaluators.
- *Windows 95: Implementing Mobile Computing.* A guide to implementing Windows 95 in a corporate mobile computing environment, organized by "problem areas" faced by corporations. From Tech•Ed 95, includes slides.
- *Windows 95 Mobile Computing: Questions and Answers.* Common questions and answers about mobile computing with Windows 95.

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