SUMMARY

SYSTEM SOFTWARE VS. APPLICATION SOFTWARE

Chapter Objective 1: Understand the difference between system software and application software.

System software consists of the programs that coordinate the activities of a computer system. The basic role of system software is to act as a mediator between **application software** (programs that allow a user to perform specific tasks on a computer, such as word processing, playing a game, preparing taxes, browsing the Web, and so forth) and the computer system's hardware, as well as between the PC and the user.

THE OPERATING SYSTEM

Chapter Objective 2: Explain the different functions of an operating system and discuss some ways that operating systems can differ from one another.

A computer's **operating system** is the primary system software program that manages the computer system's resources and interfaces with the user. The functions of the operating system include booting the computer, configuring devices and **device drivers**, communicating with the user, managing and monitoring computer resources, file management, and security. To manage the enormous collection of files typically found on a PC's hard drive, *file management programs* allow the user to organize files hierarchically into folders. To access a file in any directory, the user can specify the *path* to the file; the path identifies the drive and folders the user must navigate through in order to access the file.

Some of the differences among operating systems center around whether they use a **graphical user interface** (**GUI**) or **command line interface**, whether they are a **personal operating system** designed for individual users or a **server** (*network*) **operating system** designed for multiple users, and the types and numbers of processors supported.

Chapter Objective 3: List several ways in which operating systems enhance processing efficiency.

A variety of processing techniques can be built into operating systems to help enhance processing efficiency. **Multitasking** allows concurrent execution of two or more programs for a single user, and **multiprocessing** and **parallel processing** involve using two or more CPUs to perform work at the same time. Operating systems typically use **virtual memory** to extend conventional memory by using a portion of the hard drive as additional memory, and **spooling** frees up the CPU from time-consuming interaction with input and output devices, such as printers, by storing input and output on the way in or out of the system in a **buffer**.

OPERATING SYSTEMS FOR DESKTOP PCS AND SERVERS

Chapter Objective 4: Name today's most widely used operating systems for desktop PCs and servers.

One of the original operating systems for PCs was **DOS** (**Disk Operating System**), which is still in existence but not widely used. Most desktop PCs today run a version of **Windows**. *Windows 3.x*, the first widely used version of Windows, was an *operating environment* that added a GUI shell to DOS, replacing the DOS command line interface with a system of menus, icons, and screen boxes called *windows*. *Windows 95*, *Windows 98*, *Windows 98 Second Edition* (*SE*), *Windows NT*, *Windows Me*, *Windows 2000*, and *Windows XP*—all successors to Windows 3.*x*—each included an increasing number of enhancements, such as multitasking, a better user interface, and more Internet, multimedia, and communications functions. The current personal version of Windows is **Windows Vista**, which has a variety of versions to meet specific needs and types of PCs. The current network version of Windows (**Windows Server**), based on Windows Vista, is **Windows Server 2008**.

Mac OS is the operating system used on Apple computers. The current personal version is **Mac OS X Leopard**; **Mac OS X Server** is designed for server use. **UNIX** is a

flexible, general-purpose server operating system that works on mainframes, midrange computers, PCs used as network servers, graphics workstations, and even desktop PCs. The open source **Linux** operating system has gathered popularity because it is distributed free over the Internet and can be used as an alternative to Windows and Mac OS. Linux has earned support as a mainstream operating system in recent years and is being used in computer systems of all sizes, from desktop PCs to supercomputers.

OPERATING SYSTEMS FOR HANDHELD PCS AND MOBILE DEVICES

Chapter Objective 5: State several devices other than desktop PCs and servers that require an operating system and list one possible operating system for each type of device.

Handheld PCs and mobile devices usually require a different operating system than a desktop PC. For handheld PCs, **Windows Mobile**, **Palm OS** (the operating system designed for Palm handheld PCs), and the **BlackBerry operating system** (used with BlackBerry devices) are widely used. **Embedded Linux** is another operating system used with handheld PCs and mobile devices; smart phones often use the **Symbian OS**, which is designed around the *EPOC* operating system. Other everyday devices—such as cars—that contain a computer use an operating system, as well. **Windows Embedded** is an operating system designed primarily for nonpersonal computer-based devices, such as cash registers, ATM machines, and consumer electronic devices.

OPERATING SYSTEMS FOR LARGER COMPUTERS

High-end servers, mainframes, and supercomputers may use an operating system designed specifically for that type of system, but are increasingly using customized versions of conventional operating systems, such as Windows, UNIX, and Linux.

UTILITY PROGRAMS

Chapter Objective 6: Discuss the role of utility programs and outline several duties that these programs perform.

A **utility program** is a type of system software program written to perform specific tasks usually related to maintaining or managing the computer system. **File management programs** enable users to perform file management tasks, such as copying, moving, and deleting files. The file management system built into Windows is **Windows Explorer**. **Search tools** are designed to help users find files on their hard drives; *diagnostic* and *disk management programs* deal primarily with diagnosing and repairing PC problems, such as hard drive errors and accidentally deleted files, as well as maintenance tasks, such as performing *disk defragmentation*. *Uninstall utilities* allow programs to be removed from a hard drive without leaving annoying remnants behind, *file compression* programs reduce the stored size of files so they can be more easily archived or sent over the Internet, and **backup** programs make it easier for users to back up the contents of their hard drive. There are also a number of security-oriented utility programs, such as *antivirus*, *antispyware*, and *firewall* programs.

THE FUTURE OF OPERATING SYSTEMS

Chapter Objective 7: Describe what the operating systems of the future might be like.

In the future, operating systems will likely become even more user-friendly, voice-driven, and stable, repairing themselves when needed and causing errors and conflicts much less frequently. They will also likely continue to include improved security features, support for new technologies, and assistance for coordinating data and activities among a user's various computing and communications devices.