

## 1 What Is System Software, and What Are the Two Types of System Software?

System software consists of the programs that control or maintain the operations of a computer and its devices. Two types of system software are operating systems and utility programs. An operating system (OS) is a set of programs containing instructions that work together to coordinate all the activities among computer hardware resources. A utility program, also called a utility, performs maintenance-type tasks, usually related to managing a computer, its devices, or its programs.

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## 2 What Are the Functions of an Operating System?

The operating system starts and shuts down a computer, provides a user interface, manages programs, manages memory, coordinates tasks, configures devices, establishes an Internet connection, monitors performance, provides utilities, updates automatically, controls a network, and administers security. The user interface controls how data and instructions are entered and how information is displayed on the screen. Two types of user interfaces are a graphical user interface (GUI) and a command-line interface. Managing programs refers to how many users, and how many programs, an operating system can support at one time. An operating system can be single user/single tasking, single user/multitasking, multiuser, or multiprocessing. Memory management optimizes the use of random access memory (RAM). If memory is insufficient, the operating system may use virtual memory, which allocates a portion of a storage medium to function as additional RAM. Coordinating tasks determines the order in which tasks are processed. Tasks include receiving data from an input device, processing instructions, sending information to an output device, and transferring items between storage and memory. Configuring devices involves loading each device's driver when a user boots the computer. A driver, short for device driver, is a small program that tells the operating system how to communicate with a specific device. Establishing an Internet connection sets up a connection between a computer and an Internet access provider. A performance monitor is an operating system program that assesses and reports information about computer resources and devices. Operating systems often provide the capability of managing and searching for files, viewing images, securing a computer from unauthorized access, uninstalling programs, and other tasks. Most operating systems also include an automatic update feature that provides updates to the program. A server operating system is an operating system that organizes and coordinates how multiple users access and share network resources. Network administrators typically have an administrator account that enables them to access files, install programs, and specify network settings, including creating user accounts and establishing permissions.

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## 3 What Is the Startup Process on a Personal Computer?

Booting is the process of starting or restarting a computer. When a user turns on a computer, the power supply sends a signal to the system unit. The processor chip finds the ROM chip(s) that contains the BIOS (basic input/output system), which is firmware with the computer's startup instructions. The BIOS performs the power-on self test (POST) to check system components and compares the results with data in a CMOS chip. If the POST completes successfully, the BIOS searches for the system files and the kernel of the operating system, which manages memory and devices, and loads them into memory from storage. Finally, the operating system loads configuration information, requests any necessary user information, and displays the desktop on the screen. The operating system executes programs in the Startup folder, which contains a list of programs that open automatically when you boot the computer.

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## 4 What Are Features of Windows Vista, Mac OS X, UNIX, and Linux Operating Systems?

A stand-alone operating system is a complete operating system that works on a desktop computer, notebook computer, or mobile computing device. Windows Vista is Microsoft's fastest, most efficient operating system to date, offering quicker program start up, built-in diagnostics, automatic recovery, improved security, and enhanced searching and organizing capabilities. Most users choose from Windows Vista Home Basic, Windows Vista Home Premium, Windows Vista Ultimate, or Windows Vista Business editions. Mac OS X is a multitasking operating system available only for Apple computers. UNIX is a multitasking operating system developed at Bell Laboratories. Linux is a popular, multitasking UNIX-type operating system that is open source software, which means its code is available to the public for use, modification, and redistribution.

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## 5 What Are Various Server Operating Systems?

Server operating systems include Windows Server 2008, UNIX, Linux, Solaris, and NetWare. Windows Server 2008 is an upgrade to Windows Server 2003 and includes features of previous Windows Server versions. UNIX, like Linux, is a multipurpose operating system because it is both a stand-alone and server operating system. Solaris, a version of UNIX developed by Sun Microsystems, is a server operating system designed specifically for e-commerce applications. Novell's NetWare is a server operating system designed for client/server networks.

## **6 What Are the Features of Several Embedded Operating Systems?**

Mobile devices and many consumer electronics have an embedded operating system that resides on a ROM chip. Popular embedded operating systems include Windows Embedded CE, Windows Mobile, Palm OS, iPhone OS, BlackBerry, embedded Linux, and Symbian OS. Windows Embedded CE is a scaled-down Windows operating system designed for use on communications, entertainment, and computing devices with limited functionality. Windows Mobile, an operating system based on Windows Embedded CE, provides a user interface designed for specific types of smart phones and PDAs. Palm OS is an operating system used on smart phones and PDAs. iPhone OS, developed by Apple, is an operating system for the iPhone and iPod touch. The BlackBerry operating system runs on handheld devices supplied by RIM. Embedded Linux is a scaled-down Linux operating system for smart phones, PDAs, portable media players, and other devices requiring an embedded operating system. Symbian OS is an open source multitasking operating system designed for smart phones.

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## **7 What Is the Purpose of Several Utility Programs?**

Most operating systems include several built-in utility programs. A file manager performs functions related to file management. A search utility attempts to locate a file on your computer based on criteria you specify. An image viewer displays, copies, and prints the contents of a graphics file, such as photos. An uninstaller removes a program and any associated entries in the system files. A disk cleanup utility searches for and removes unnecessary files. A disk defragmenter reorganizes the files and unused space on a computer's hard disk. A backup utility is used to copy, or back up, selected files or an entire hard disk to another storage medium. A restore utility reverses the backup process and returns backed up files to their original form. A screen saver displays a moving image or blank screen if no keyboard or mouse activity occurs for a specified time. A personal firewall detects and protects a personal computer from unauthorized intrusions. An antivirus program protects computers against a virus, or potentially damaging computer program, by identifying and removing any computer viruses. A spyware remover detects and deletes spyware and other similar programs. An adware remover detects and deletes adware. Internet filter programs can include Web filtering software, an anti-spam program, a phishing filter, and a pop-up blocker. A file compression utility shrinks the size of a file so that it takes up less storage space. A media player allows you to view images and animation, listen to audio, and watch video files on a computer. Disc burning software writes text, graphics, audio, and video files on a recordable or rewritable CD, DVD, or Blu-ray Disc. A personal computer maintenance utility identifies and fixes operating system problems and improves a computer's performance.

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