

Discovering Computers
Concepts for a Digital World **2003** Chapter 8 Objectives

Describe the two types of software

Identify various stand-alone operating systems

Understand the startup process for a personal computer

Identify various network operating systems

Describe the term user interface

Recognize devices that use embedded operating systems

Explain features common to most operating systems

Discuss the purpose of the following utilities: file viewer, file compression, diagnostic, uninstaller, disk scanner, disk defragmenter, backup, and screen saver

Know the difference between stand-alone operating systems and network operating systems

Next
8.2

Discovering Computers
Concepts for a Digital World **2003** Operating Systems

What is an operating system (OS)?

- Set of programs that coordinates all activities among computer hardware resources

Operating System

Next
8.3

Discovering Computers
Concepts for a Digital World **2003** Operating Systems

What are the functions of an operating system?

start up the computer

monitor performance and provide housekeeping services

manage memory

administer security

manage programs

control a network

schedule jobs and configure devices

provide user interface

access the Web

p.83 Fig. 8-1

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Concepts for a Digital World **2003** Operating Systems

Where is the operating system located?

operating system resides on ROM in handhelds

operating system resides on hard disk in most cases

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Discovering Computers
Concepts for a Digital World **2003** Operating Systems

What is a cross-platform application?

- One that runs identically on multiple operating systems

runs on Windows 95, 98, 2000, ME, and XP

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8.4 Fig. 8.2

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What is booting?

- Process of starting or restarting a computer

cold boot

Process of turning on a computer after it has been powered off completely

warm boot

Process of restarting a computer that is already powered on

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What messages display on the screen when you boot the computer?

BIOS version and copyright notice: ROM BIOS Version 2.10 A05
Copyright BIOSTech Inc. 2003
All rights reserved

total amount of memory: 0065536 KB

devices detected and tested: Keyboard.....Detected
Mouse.....Detected
Hard Disk Installed WCV AC41600H
Floppy A: Installed

Windows message: Starting Windows

sound card and CD-ROM drivers loaded: SoundUTIL TSR Version 1.20
Copyright SoundCard Technology 2002-03
IDE CD-RW Device Driver Version V2.33 (4/20/03)
Copyright Gajjin Electric Co.
1 drive(s) selected

Next
8.4 Fig. 8-3

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How does a personal computer boot up?

- 1: Power supply sends signal to components in system unit
- 2: The processor accesses BIOS to start computer

Step 2

Processor

BIOS

Next
8.5 Fig. 8-4

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Step 3: BIOS checks components such as mouse, keyboard connectors, and expansion cards

Step 3

processor

BIOS

expansion cards

CD-ROM drive

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8.5 Fig. 8-4

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Step 4: Results of POST are compared to data in the CMOS chip

Step 4

processor

BIOS

expansion cards

CD-ROM drive

CMOS

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8.5 Fig. 8-4

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Step 5: BIOS looks for system files in drive A (floppy disk drive) and then drive C (hard disk)

Step 5

processor

BIOS

expansion cards

hard disk

CD-ROM drive

floppy disk drive

CMOS

Drive that contains operating system is called **boot drive**

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8.5 Fig. 8-4

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Step 6: Boot program loads kernel of operating system into RAM from boot drive
 Operating system in memory takes control of computer

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8.5 Fig. 8-4

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Step 7: Operating system loads configuration information and displays desktop on screen
 Operating system executes programs in StartUp folder

click Start to display list of applications you can run

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8.5 Fig. 8-4

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What is an emergency recovery disk?

- Floppy disk that contains system files that will start computer when hard disk becomes damaged and computer cannot boot
- Also called repair disk, boot disk, or rescue disk

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8.6 Fig. 8-5

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What is a user interface?

- Controls how you enter data and instructions and how information displays on screen

command-line (DOS) interface

graphical (Windows) interface

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8.7 Fig. 8-6

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What is multitasking?

- Allows single user to work on two or more applications that reside in memory at same time

- Foreground contains active application - the one you currently are using
- Background contains inactive programs that are running but are not in use

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8.9 Fig. 8-8

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What are other program management features of operating systems?

- multiuser**
Operating system enables two or more users to run a program simultaneously
- multiprocessing**
Operating system can support two or more processors running programs at same time
- fault-tolerant computer**
Continues to operate even if one of its components fails
Computer has duplicate components such as processors, memory, and disk drives

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What is memory management?

- Optimizes the use of random access memory (RAM)

allocates, or assigns, data and instructions to area of memory while they are being processed

monitors contents of memory

clears items from memory when processor no longer requires them

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What is virtual memory (VM) management?

- Operating system allocates portion of hard disk to function like RAM
- Paging
- Thrashing

page swapped out

disk (virtual memory)

RAM (physical memory)

page swapped in

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8.8.10 Fig. 8-9

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How does an operating system schedule jobs?

- Adjusts schedule based on job's priority

receiving data from an input device

job

An operation the processor manages

transferring items from storage to memory and from memory to storage

sending information to an output device

processing instructions

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What is spooling?

- Print jobs sent to buffer instead of directly to printer, where print jobs wait their turn

print spooler application

print job

print queue

server

jobs to be printed

disk

laser printer

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8.8.11 Fig. 8-10

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What is a device driver?

- Small program that tells operating system how to communicate with a device
- Each device requires its own specific driver

device driver

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How do you install a device driver?

- Use the Printers and Other Hardware link in Control Panel

Control Panel

Printers and Other Hardware link

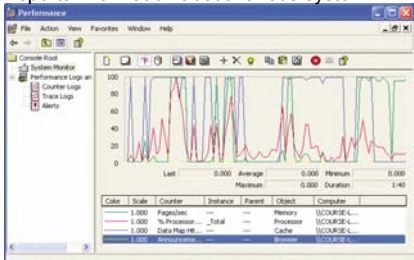
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8.8.12 Fig. 8-11

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Operating System Functions

How does an operating system monitor performance?

- Provides a program, called **performance monitor**, that assesses and reports information about various system resources and devices



Color	Scale	Counter	Instance	Parent	Object	Computer
Blue	0-100	Pages/sec			Memory	SCORPION
Green	0-100	% Processor Time	_Total		Processor	SCORPION
Red	0-100	Cache Reads/sec			Cache	SCORPION
Yellow	0-100	Branches/sec			Branch	SCORPION

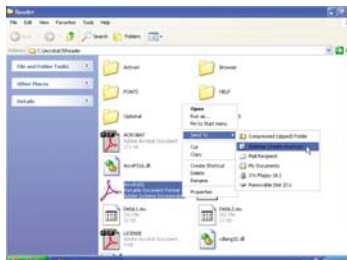
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8.14 Fig. 8-14

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Operating System Functions

How does an operating system manage files?

- Includes a program called **file manager**, such as **Windows Explorer**
 - Commands include Copy, Rename, Delete, Move, Format, and New Folder



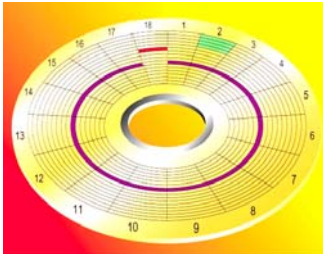
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Operating System Functions

What is a **file allocation table (FAT)**?

- A table of information that operating system uses to locate files on a disk
- Reformatting disk usually erases only file allocation table and leaves actual files on disk




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Operating System Functions

What are features of a **network operating system**?

- Server** is computer that controls access to network and provides centralized storage area
- Other computers on network are called **clients**



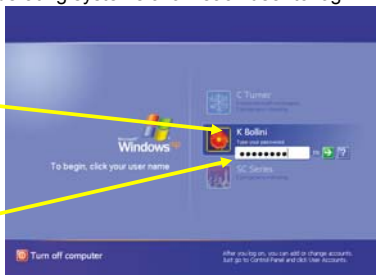
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Operating System Functions

How do operating systems administer security?

- Most multiuser operating systems allow each user to log on

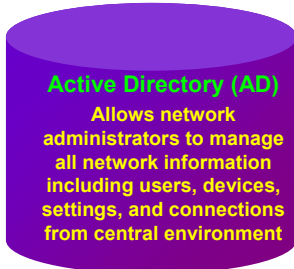


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Operating System Functions

What is **Active Directory (AD)**?





Active Directory (AD)
Allows network administrators to manage all network information including users, devices, settings, and connections from central environment

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Discovering Computers 2003 Network Operating Systems
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What is Linux?

- Popular, free, open-source multitasking UNIX-type operating system
- Open-source software means code is available to the public





Next
8.24 Fig. 8-25

Discovering Computers 2003 Network Operating Systems
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What is Solaris?

- UNIX-type operating system designed specifically for e-commerce applications
- Can manage high-traffic accounts
- Incorporates security necessary for Web transactions
- Developed by Sun Microsystems



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Discovering Computers 2003 Embedded Operating Systems
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What is an embedded operating system?

- Operating system found on most handheld computers and small devices
- Resides on a ROM chip





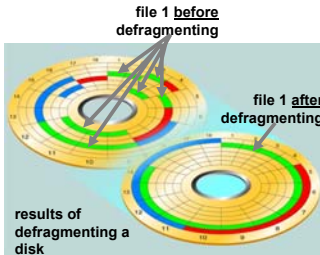
Palm OS®
Pocket PC 2002
Windows CE

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Discovering Computers 2003 Utility Programs
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What is a utility program?

- System software that performs a specific task
- Examples include:
 - File viewer
 - File compression
 - Diagnostic utility
 - Uninstaller
 - Disk scanner
 - Disk defragmenter
 - Backup utility
 - Screen saver



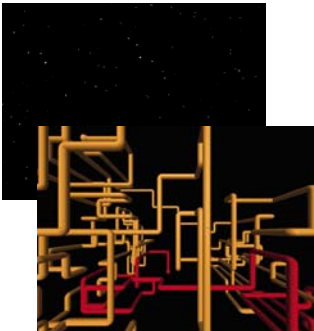
file 1 before defragmenting
file 1 after defragmenting
results of defragmenting a disk

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Discovering Computers 2003 Utility Programs
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What is a screen saver?

- Causes monitor's screen to display a moving image or blank screen if there is no activity for a specified time period
- Prevents ghosting
- Popular for security, business, or entertainment purposes



Next
8.31 Fig. 8-35

Discovering Computers 2003 Summary of Operating Systems and Utility Programs
 Concepts for a Digital World Web and XP Enhanced

- System software
- Operating systems
- Operating system functions
- Types of operating systems
- Stand-alone operating systems
- Network operating systems
- Embedded operating systems
- Utility programs

Chapter 8 Complete

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