

System Software

Chapter 4

Learning Objectives

- 1. Describe the differences between system software and application software.
- 2. Identify the four types of system software.
- 3. Explain the basic functions, features, and categories of operating systems.
- 4. Compare mobile operating systems iOS, Android, and Windows Phone.
- 5. Compare desktop operating systems including Windows, Mac OS, UNIX, Linux, and virtualization.
- 6. Explain the purpose of utilities and utility suites.
- 7. Identify the four most essential utilities.
- 8. Describe Windows utility programs.

Introduction

- Computers and computer applications have become a part of the fabric of every day life
 - They are great as long as they are working
- We give little thought to the processes and programs running behind the scenes to keep them functioning effectively.
- Such programs (i.e. operating systems, utility programs, and device drivers) are the system software you learn about here.

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System Software

- Works with end users, application software, and computer hardware
 - Handles the technical details
 - Includes

System Software

- operating system
- utilities
- device drivers
- language translators



Operating Systems

A collection of programs that handle technical tasks

- Functions
 - Manages computer resources
 - Coordinate memory, processing, storage, printers and monitors
 - Monitor system performance
 - Schedule tasks
 - Provide security
 - Start-up the computer
- Provides user interface
 - Graphical user interface (GUI)
- Runs applications
 - Multitasking
 - Foreground and background applications

Features of an Operating System

Booting – starting or restarting the computer

- Features in common with application software
 - Icons
 - Pointer
 - Windows
 - Menus
 - Tabs
 - Dialog boxes
 - Help
 - Gesture Control
- Files and Folders
 - Files share data and programs
 - Folders store related files



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Desktop

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Categories of Operating Systems



- Embedded operating systems RTOS (real-time operating systems)
 - Smartphones
 - Smartwatches
 - Video game systems
- Stand-alone operating systems
 - Also called desktop operating system
- Network operating systems (linked computers)
 - Windows Server, Linux, Unix
 - OS stored on network server which coordinates all communication between the other computers



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Mobile Operating Systems



- Embedded operating system
 - Less complicated and more specialized for wireless
- Some of the best known
 - Android
 - i0S
 - Windows Phone

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Desktop Operating Systems

- Operating systems commonly used by individuals
 - Windows most widely used
 - Mac OS powerful and easy to use
 - UNIX network; originally designed for Web
 - LINUX non proprietary; free from the Web

Windows - Most Used OS



• Windows 8

Integrates the desktop
OS with its mobile OS



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- Windows 10
- Merges Windows desktop and mobile operating systems



Mac OS

- Mac OS X runs on Apple computers
- Two most recent versions:
 - OS X Mavericks
 - Improved power management
 - OS X Yosemite

System Software

New user interface

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UNIX and LINUX



- Servers on the Web
- Mainframe computers
- Personal Computers
- LINUX version of UNIX
 - Alternative to windows
 - Open source free
 - Google Chrome OS based on Linux
 - Focuses on Internet connectivity and cloud computing
 - Speed is determined by the speed of the Internet



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Virtualization

- Ability to support multiple operating systems on a single physical machine
- Virtualization software
 - Each virtual machine appears as a separate independent computer
 - Host operating system
 - Guest operating system
- Parallels
 - Mac to run Windows programs in OS X





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Utilities

- Specialized programs to make computing easier
- Most essential utilities
 - Troubleshooting or diagnostic programs
 - Recognizes and correct problems
 - Antivirus programs
 - Guard your computer against viruses
 - Backup programs
 - Copies of files to restore if necessary
 - File compression programs
 - Reduces the size of files for more efficient storage

Making IT Work for You – Mac OS X Activity Monitor

Has your computer ever just stopped responding? What do you do?

Mac OS X Activity Monitor is designed to help.

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				Activity M	onitor (A	Il Processe	s)			
0	0	* ~	CPU	Memory	Energ	y Disk	Network	Q	Searc	h
Proces	ss Name	3		%	CPU ~	CPU Time	Threads	Idle Wake Ups	PID	User
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×	Acroba	it			6.6	47:19.15	30	135	10206	dao
	distnot	ed			3.0	49:13.93	10	0	453	dao
	kernel_	task			2.6	5:29:03.96	98	329	0	root
	Window	wServer			2.2	1:54:02.99	4	12	267	_windows
4	Activity	Monitor			1.6	1.96	7	3	18497	dao
	distnot	ed			1.0	15:04.72	9	0	119	_distnote
	sysmor	nd			0.8	12.09	3	1	15119	root
	coreau	diod			0.7	17:03.54	7	8	473	_coreaudi
	prl_dis	p_service			0.7	1:15:30.82	19	2	509	root
	MDCra	shReportTool			0.5	36:53.73	6	10	7692	dao
0	Safari				0.5	1:08.72	24	0	18164	dao
4	Google	Drive			0.4	48:47.78	28	15	599	dao
	pbs				0.4	0.15	6	0	15414	dao
	System	UIServer			0.4	31:52.42	6	1	468	dao
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• • •		Activity Monitor (All Processes)									
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	AirPort	Base Station Agent			0.0)	0.06	4	0	15042	dao
	airport	d			0.0)	2:40.95	4	0	58	root
	amfid				0.0)	0.09	2	0	16857	root
4	Android	d File Transfer Agent			0.0)	0.20	2	0	608	dao
	applee	ventsd			0.0)	2.30	2	0	52	_apple
	Applel	DAuthAgent			0.0)	1.14	6	0	18153	dao
	AppleN	AobileDeviceHelper			0.0)	1.06	3	0	7689	dao
	AppleS	Spell			0.0)	20.82	2	0	630	dao
	apsd				0.0)	1:18.68	4	0	82	root
	askper	missiond			0.0)	0.11	2	0	582	dao
	aslman	ager			0.0)	0.01	2	0	17427	root
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Windows Utilities

Windows Operating Systems includes utilities such as:

- File History
 - Can create a backup for your hard drive
- Disk Cleanup
 - Identifies and eliminates non essential files
- Disk Defragmenter
 - Rearranges files and unused disk space to optimize performance

File History

• Utility program included with Windows 8

- Makes a copy of all files in the libraries, contacts, favorites and the desktop
- Helps prevent the effect of disk failure



File History		-		×
- 🚽 🕆 🛧 を Contro	l Panel > System and Security > File History v 친 Search Cor	itrol Panel		p
Control Panel Home	Keep a history of your files			
Restore personal files	File History saves copies of your files so you can get them back if they're lost o	r damaged.		
Select drive	File History is off			
Advanced settings	Copy files from: Libraries, Desktop, Contacts, and Favorites Copy files to:			
			Turn or	n
See also				
See also Recovery				

Disk Cleanup



• Frees up valuable space and improves system performance



Disk Cleanup		×
Are you sure you wan these files?	t to permanently delete	
	Delete Files Cancel	

Disk Defragmenter



- Tracks concentric ring
- Sectors wedge-shaped sections of a track
- Optimize drives utility program
 - Identifies and eliminates unnecessary fragments
 - Files become fragmented
 - Broken up and stored in non contiguous space



Rearranges files and unused disk space to optimize operations

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Defragment and Optimize Drives Windows application	Optimize Drives				- 0	×
Defragment and optimize your drives Control panel	You can optimize your o optimized. Only drives o	trives to help your compu on or connected to your c	ter run more efficient omputer are shown.	ly, or analyze them to find out	if they need to be	
Web	Status					
, ○ defragment	Drive	Media type	Last run	Current status		
A defragment and optimize drives	(C:)	Hard disk drive	Never run	OK (0% fragmented)		
P defragment computer	System Reserved	Hard disk drive	Never run	OK (0% fragmented)		
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Utility Suites

- Combine several programs into one package
- Less expensive
- Popular suites
 - Bit Defender
 - Norton Utilities
 - Kaspersky

-x**Norton Utilities** 203 Performance Settings Privacy Recovery Next steps required to achieve good System Health System Health: Your System Health is FAIR. Please follow ▲ Compact Registry the steps on the right to optimize your PC. Clear Document History Bleach Free Disk Space i Performance Privacy Windows (C:) <> Windows Startup 1 Windows History 220 Capacity: 52.3 GB 8933 Current Startup: 00:15 Internet History and the second distance of the second distanc Previous Startup: Application History 23 40.3 / 52.3 GB (77 %) Windows Optimizations Smart Defrag OFF Performance Profile applied: Repair Defragment Balanced Norton Your trial expires in 30 day(s)! Help **R** Activate Smart Update

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Careers In IT

- Computer Support Specialist or Technical Support Specialist
 - Provide technical support to customers and other users
 - Resolve common networking problems and use troubleshooting programs to diagnose problems
 - Employers look for an advanced associate degree or bachelors degree, good analytical, customer service, communication and people skills
 - Computer support specialist can expect to earn \$29K - \$40K annually

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A Look to the Future – Self Healing Computers



- Could mean an end to computer crashes and performance problems
- Fix software problems
- Reroute functions around broken hardware
- IBM's Automatic Computing Initiative (ACI)
 - Handles time-consuming maintenance
 - Self-regulating and virtually invisible
- Self-maintaining servers
 - Self-repairing
 - Self-updating
 - Self-protecting



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Open-Ended Questions (Page 1 of 2)

1. Describe system software. Discuss each of the four types of system programs.

2. Define operating systems. Describe the basic features and the three categories of operating systems.

3. What are mobile operating systems? Describe leading mobile operating systems.

Open-Ended Questions (Page 2 of 2)

4. What are desktop operating systems? Compare Windows, Mac OS, Linux and Chrome OS. Discuss virtualization.

5. Discuss utilities. What are the most essential utilities? What is a utility suite?