Objectives Overview

- Define system software and identify the two types of system software
- Describe the functions of an operating system
- Summarize the features of several stand-alone operating systems
- Identify various server operating systems
- Briefly describe several embedded operating systems
- Explain the purpose of several utility programs

See Page 269 for Detailed Objectives
System Software

- **System software** consists of the programs that control or maintain the operations of the computer and its devices.

- **Operating systems**
- **Utility Programs**
Operating Systems

• An **operating system (OS)** is a set of programs containing instructions that work together to coordinate all the activities among computer hardware resources.

  - Start and shut down a computer
  - Provide a user interface
  - Manage programs
  - Manage memory
  - Coordinate tasks
  - Configure devices
  - Establish an Internet connection
  - Monitor performance
  - Provide utilities
  - Automatically update
  - Control a network
  - Administer security
Operating System Functions

- The process of starting or restarting a computer is called **booting**

**Cold boot**
- Turning on a computer that has been powered off completely

**Warm boot**
- Using the operating system to restart a computer

Figure 7-2
Operating System Functions

- An operating system includes various shut down options

  **Sleep mode** saves any open documents and programs to RAM, turns off all unneeded functions, and then places the computer in a low-power state.

  **Hibernate** saves any open documents and programs to a hard disk before removing power from the computer.
Operating System Functions

- A **user interface** controls how you enter data and instructions and how information is displayed on the screen.
- With a **graphical user interface (GUI)**, you interact with menus and visual images.
Operating System Functions

• With a **command-line interface**, a user uses the keyboard to enter data and instructions.
Operating System Functions

• How an operating system handles programs directly affects your productivity

- Single user and multiuser
- Single tasking and multitasking
- Foreground and background
- Multiprocessing
Operating System Functions

Figure 7-4
Operating System Functions

- **Memory management** optimizes the use of RAM
- **Virtual memory** is a portion of a storage medium functioning as additional RAM
- **Windows ReadyBoost** can allocate available memory in flash memory devices as additional memory cache
Operating System Functions

• The operating system determines the order in which tasks are processed

Click to view Web Link, click Chapter 7, Click Web Link from left navigation, then click Spooling below Chapter 7
A **driver** is a small program that tells the operating system how to communicate with a specific device.

**Plug and Play** automatically configures new devices as you install them.
Operating System Functions

- Operating systems typically provide a means to establish Internet connections
Operating System Functions

• A performance monitor is a program that assesses and reports information about various computer resources and devices.
Operating System Functions

- Operating systems often provide users with the capability of:
  - Managing files
  - Searching for files
  - Viewing images
  - Securing a computer
  - Uninstalling programs
  - Cleaning up disks
  - Defragmenting disks
  - Diagnosing problems
  - Backing up files and disks
  - Setting up screen savers
Operating System Functions

- **Automatic update** automatically provides updates to the program
Operating System Functions

• Some operating systems are designed to work with a server on a network

• A server operating system organizes and coordinates how multiple users access and share resources on a network

• A network administrator uses the server operating system to:
  – Add and remove users, computers, and other devices
  – Install software and administer network security
Operating System Functions

• Each user has a user account
  – A user name, or user ID, identifies a specific user
  – A password is a private combination of characters associated with the user name
## Types of Operating Systems

<table>
<thead>
<tr>
<th>Category</th>
<th>Operating System Name</th>
</tr>
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<tbody>
<tr>
<td>Stand-alone</td>
<td>• DOS&lt;br&gt;• Early Windows versions (Windows 3.x, Windows 95, Windows NT Workstation, Windows 98, Windows 2000 Professional, Windows Millennium Edition, Windows XP, Windows Vista)&lt;br&gt;• Windows 7&lt;br&gt;• Mac OS X&lt;br&gt;• UNIX&lt;br&gt;• Linux</td>
</tr>
<tr>
<td>Server</td>
<td>• Early Windows Server versions (Windows NT Server, Windows 2000 Server, Windows Server 2003)&lt;br&gt;• Windows Server 2008&lt;br&gt;• UNIX&lt;br&gt;• Linux&lt;br&gt;• Solaris&lt;br&gt;• NetWare</td>
</tr>
<tr>
<td>Embedded</td>
<td>• Windows Embedded CE&lt;br&gt;• Windows Mobile&lt;br&gt;• Palm OS&lt;br&gt;• iPhone OS&lt;br&gt;• BlackBerry&lt;br&gt;• Google Android&lt;br&gt;• Embedded Linux&lt;br&gt;• Symbian OS</td>
</tr>
</tbody>
</table>
A stand-alone operating system is a complete operating system that works on a desktop computer, notebook computer, or mobile computing device.

- Windows 7
- Mac OS X
- UNIX
- Linux
Stand-Alone Operating Systems

• **Windows 7** is Microsoft’s fastest, most efficient operating system to date and is available in multiple editions:
Stand-Alone Operating Systems
Stand-Alone Operating Systems

• The Macintosh operating system has set the standard for operating system ease of use
• Latest version is Mac OS X
Stand-Alone Operating Systems

**UNIX** is a multitasking operating system

**Linux** is an open-source, popular, multitasking UNIX-type operating system

Click to view Web Link, click Chapter 7, Click Web Link from left navigation, then click Linux below Chapter 7
Server Operating Systems

Windows Server 2008

UNIX

Linux

Solaris

NetWare
Embedded Operating Systems

- An **embedded operating system** resides on a ROM chip on a mobile device or consumer electronic device.

- Windows Embedded CE
- Windows Mobile
- Palm OS
- iPhone OS
- BlackBerry
- Google Android
- Embedded Linux
- Symbian OS
Utility Programs

• A utility program is a type of system software that allows a user to perform maintenance-type tasks.
Utility Programs

• A file manager is a utility that performs functions related to file management
  – Displaying a list of files
  – Organizing files in folders
  – Copying, renaming, deleting, moving, and sorting files and folders
Utility Programs

- A **search utility** is a program that attempts to locate a file on your computer based on criteria you specify.
Utility Programs

- An **uninstaller** removes a program, as well as any associated entries in the system files.
- An **image viewer** allows users to display, copy, and print the contents of a graphics file.
Utility Programs

• A disk cleanup utility searches for and removes unnecessary files
  – Downloaded program files
  – Temporary Internet files
  – Deleted files
  – Unused program files
Utility Programs

- A disk defragmenter reorganizes the files and unused space on a computer’s hard disk so that the operating system accesses data more quickly and programs run faster
  - Defragmenting
Utility Programs

• A **backup utility** allows users to copy files to another storage medium.

• A **restore utility** reverses the process and returns backed up files to their original form.
Utility Programs

• A **screen saver** causes a display device’s screen to show a moving image or blank screen if no activity occurs for a specified time.

• A **personal firewall** detects and protects a personal computer from unauthorized intrusions.
Utility Programs

<table>
<thead>
<tr>
<th><strong>A virus</strong> describes a potentially damaging computer program that affects a computer negatively</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A worm</strong> copies itself repeatedly in memory or over a network</td>
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<tr>
<td><strong>A Trojan horse</strong> hides within or looks like a legitimate program</td>
</tr>
<tr>
<td><strong>An antivirus program</strong> protects a computer against viruses</td>
</tr>
</tbody>
</table>
Video: Free Online Antivirus

[kaspersky.com/virusscanner]

CLICK TO START

Chapter 7
Utility Programs

### Signs of Virus Infection

- An unusual message or image is displayed on the computer screen
- An unusual sound or music plays randomly
- The available memory is less than what should be available
- A program or file suddenly is missing
- An unknown program or file mysteriously appears
- The size of a file changes without explanation
- A file becomes corrupted
- A program or file does not work properly
- System properties change
- The computer operates much slower than usual
Utility Programs

Spyware is a program placed on a computer without the user’s knowledge that secretly collects information about the user.

- A spyware remover detects and deletes spyware and other similar programs.

Adware displays an online advertisement in a banner or pop-up window.

- An adware remover is a program that detects and deletes adware.
Utility Programs

- Filters are programs that remove or block certain items from being displayed

- Anti-spam programs
- Web filters
- Phishing filters
- Pop-up blockers
Utility Programs

- A **file compression utility** shrinks the size of a file(s)
  - Compressing files frees up room on the storage media
- Compressed files sometimes are called **zipped files**
  - Can be **uncompressed**
Utility Programs

• A **media player** allows you to view images and animation, listen to audio, and watch video files on your computer.
Utility Programs

• **Disc burning software** writes text, graphics, audio, and video files on a recordable or rewritable optical disc.
Utility Programs

• A personal computer maintenance utility identifies and fixes operating system problems, detects and repairs disk problems, and includes the capability of improving a computer’s performance.
Summary

- Definition of an operating system
- Functions common to most operating systems
- Variety of stand-alone operating systems, server operating systems, and embedded operating systems
- Several utility programs