Chapter 5

System Software

Competencies (Page 1 of 2)

- **Describe the differences between system software and application software**

- **Discuss the four types of system software**

- **Discuss the basic functions, features, and categories of operating systems**

- **Describe the Windows, Mac OS, UNIX, & Linux operating systems**

Competencies

- **Describe the purpose of utilities and utility suites**
- **Identify the five most essential utilities**
- **Discuss Windows utility programs**
- **Describe device drivers, including printer drivers**

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Introduction

Computers and computer applications are ubiquitous in our lives so much so that we expect them to "be there when we need them". We often give little thought to the processes and programs running behind the scenes to keep our computers functioning effectively. These kinds of programs and processes (i.e. operating systems, utility programs, device drivers, etc…) fall under the topic of system software and are covered in this chapter.
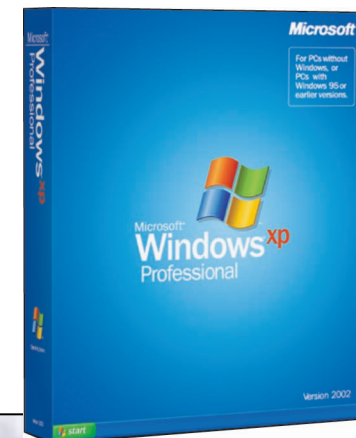
System Software

- **Handles technical details**
- **Works with end users, application software, and computer hardware**
- **Four types of programs**
  - **Operating system**
  - **Utilities**
  - **Device drivers**
  - **Language translators**

Software Development Tools

Operating Systems

- **Manage computer resources**
- **Provide an interface between the users and computer**
- **Runs applications**
- **A collection of programs that handle technical tasks**
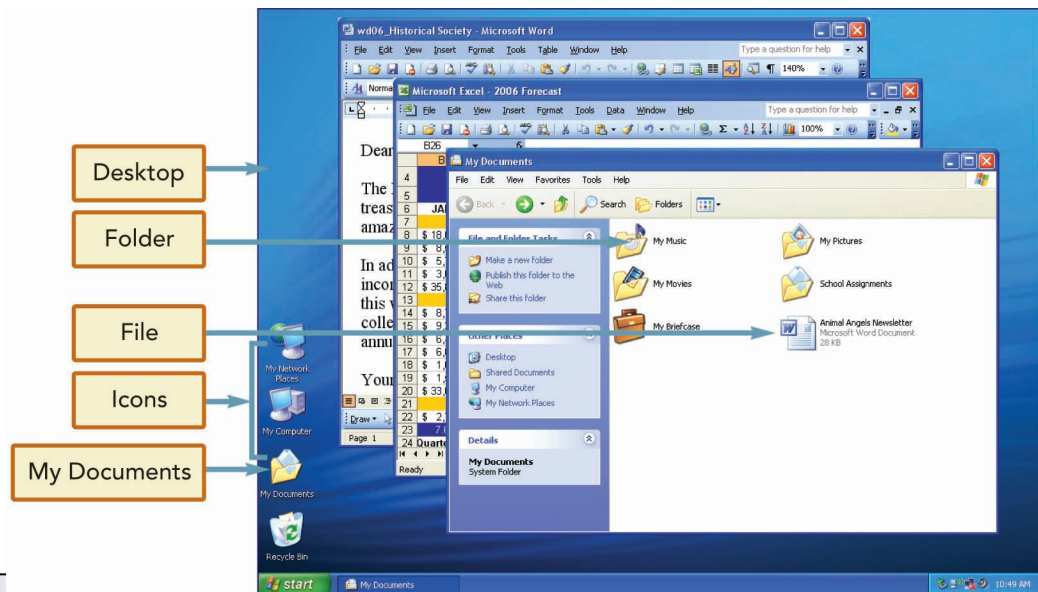- **Every computer has an operating system**

Functions of an Operating System

- **Performs three types of functions**
  - **Manages computer resources**
    - **Coordinate memory, processing storage, and printers**
    - **Monitor system performance**
    - **Provide security**
    - **Start-up the computer**
  - **Provides user interface**
    - **Character-based interface**
    - **Graphical user interface (GUI)**
  - **Runs applications**
    - **Multitasking**
    - **Foreground & background applications**

Features of an Operating System

- **Booting**
- **Features in common with application software**
  - Icons
  - **Pointers**
  - Windows
  - **Menus**
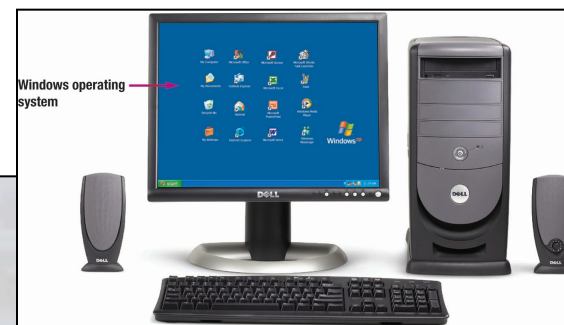 - **Dialog boxes**
  - **Help**

Categories of Operating Systems

- **Hundreds of operating systems**

- **Three basic categories**
  - **Embedded operating systems** – hand-held

  - **Network operating systems** – linked computers
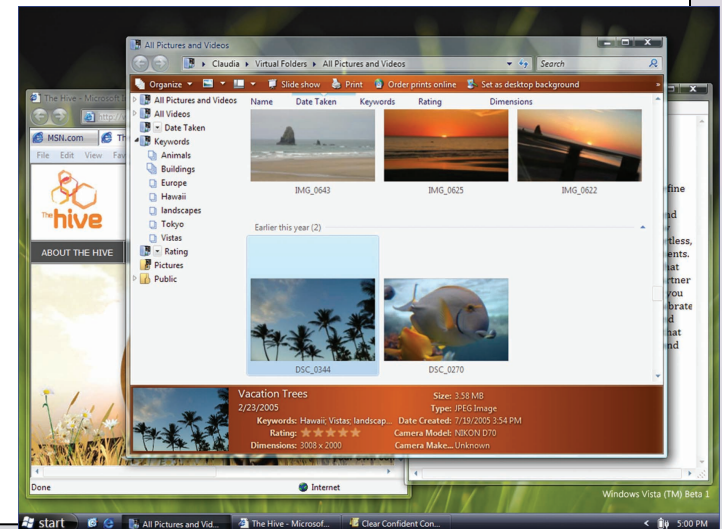

  - **Stand-alone operating systems** – desktop

More on Operating Systems

- **OS often called software environment or platform**

- **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 operating system

Windows

- **The most popular microcomputer operating system – about 90 percent of the market**

- **Comes in a variety of different versions**

- **Windows XP is the most widely used version**

- **Windows Vista was released in late 2006**

Mac OS

- **An operating system designed to run on Apple computers**
- **Not used as widely as Windows**
- **The most innovative operating system**
- **Mac OS X is the latest version**
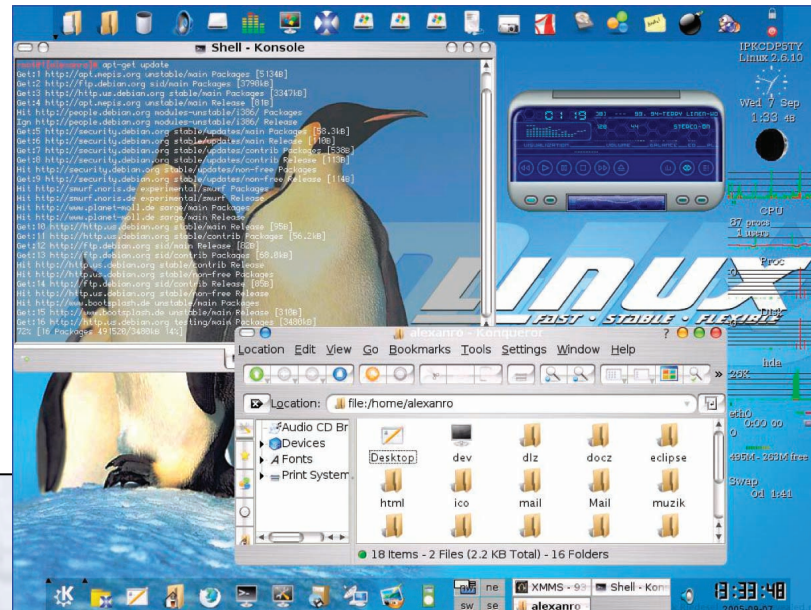- **The current version of Mac OS is Leopard**
  - **OS 10.5.6**

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Mac OS

- **Demonstrate**
  - **Dock**
  - **Dashboard widgets**
  - **Menu bar**
  - **Login/logout**
  - **Time Machine**

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UNIX and LINUX

- ## UNIX operating system
  - ### Originally designed to run on minicomputers on a network
  - ### Used by powerful microcomputers
- ## LINUX is a version of UNIX
  - ### Not proprietary
  - ### Open source

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Utilities

- **Specialized programs to make computing easier**

- **Most essential utilities**
  - **Troubleshooting** or **diagnostic programs**
  - **Antivirus programs**
  - **Uninstall programs**
  - **Backup programs**
  - **File compression programs**

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File Compression

- <u>Goal:</u> Reduce file size
- Eliminate redundancy
- Files must be decompressed
- Mac: DMG (automatically decompressed)
- Windows: Winzip (.zip)
- Different compression formats
- The programs handle several formats

Encryption

- **Goal: Make file difficult/impossible to read**
  - **<u>Encode</u> the file**
  - **Transmit the file**
  - **<u>Decode</u> the file**
- **Several different algorithms**
  - **State-of-the-art encryption is totally effective**
- **A key (or password) is needed**
  - **Can't decode without it!**
- **May be computationally "intensive"**

Windows Utilities
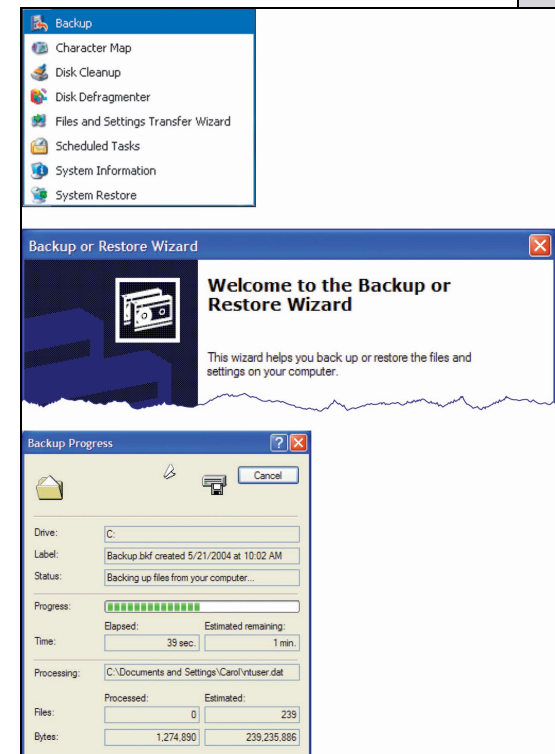
- **Backup**

- **Disk Cleanup**

- **Disk Defragmenter**

Accessing Windows XP utilities:

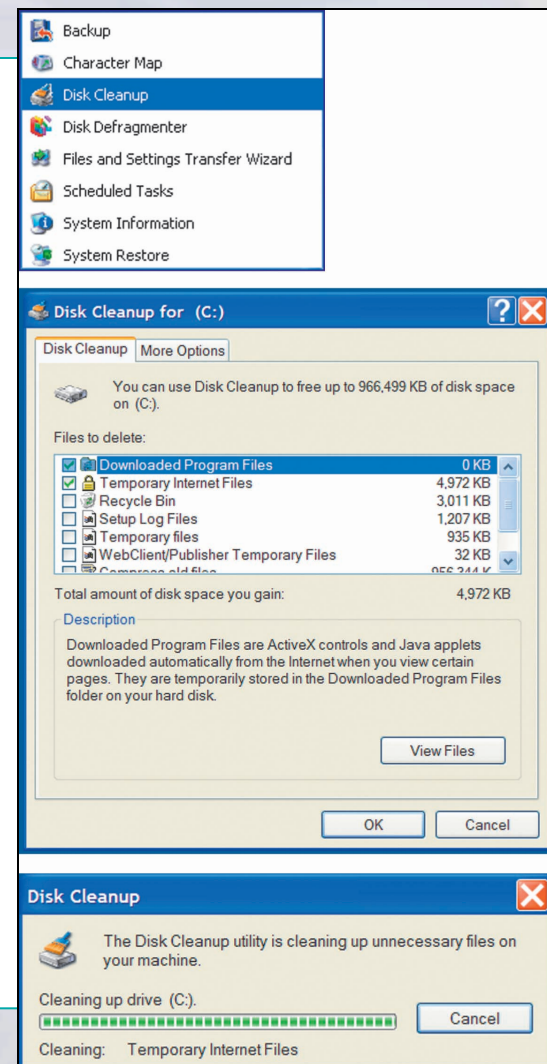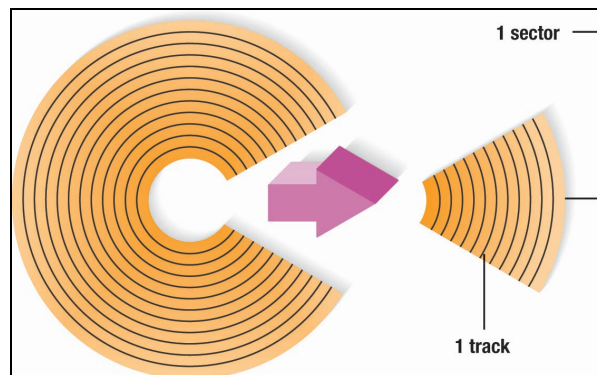**Click Start, Select All Programs, Select Accessories, Choose System Tools**

Backup

- **Utility program included with many Windows versions**

- **Makes a copy of all files or selected files that have been saved on a disk**
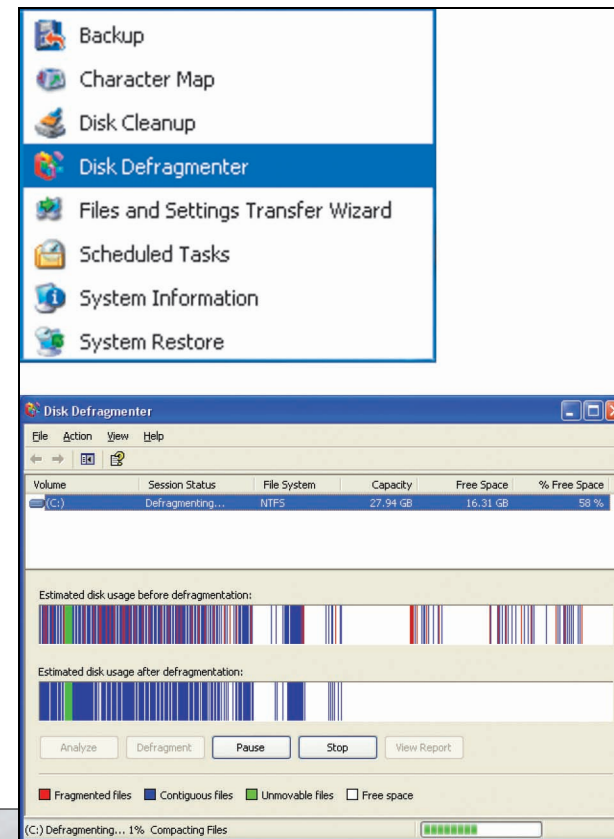
- **Helps prevent against disk failure**

Disk Cleanup

- **Identifies and eliminates nonessential files**

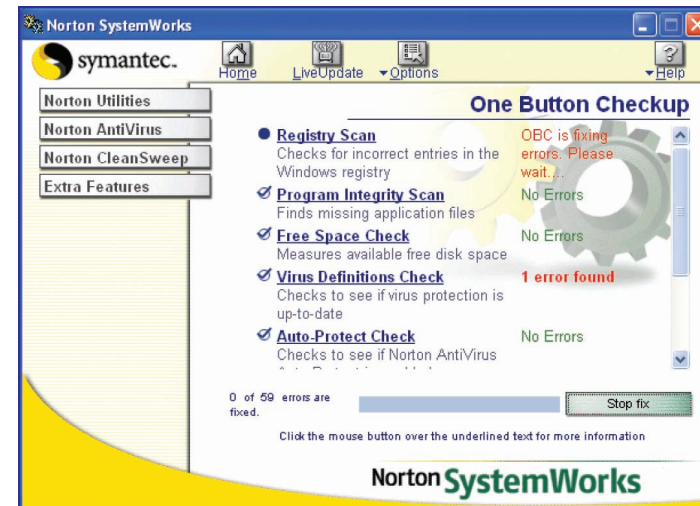- **Frees up valuable space and improves system performance**

Disk Defragmenter

- **Identifies and eliminates unnecessary fragments**
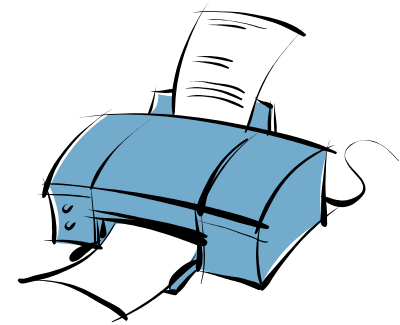- **Rearranges files and unused disk space to optimize operations**
- **Speeds up file access**

Utility Suites

- **A group of several utility programs bundled for sale**

- **Buying the package is economical**

- **Popular suites**
  - **Norton System Works**
  - **McAfee Office**
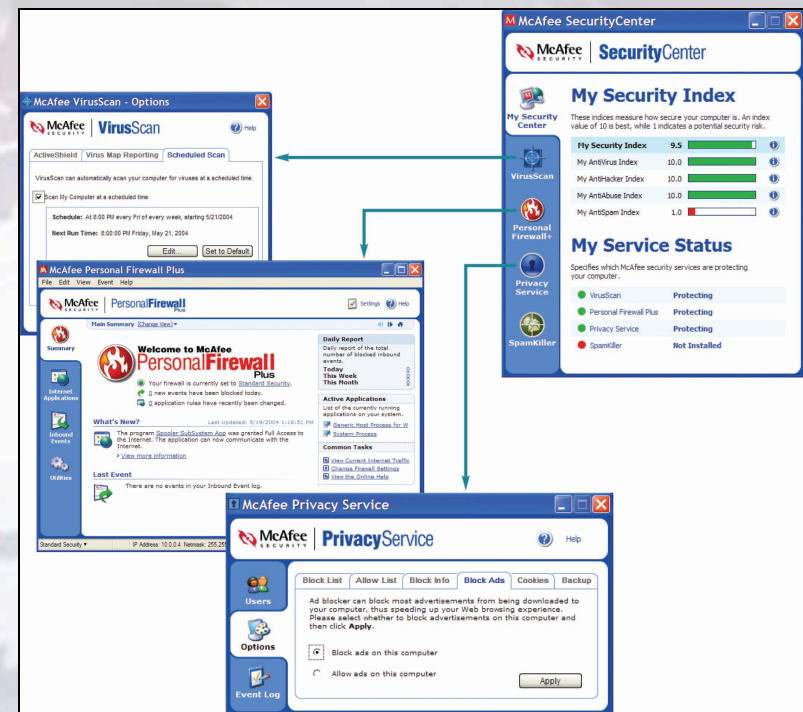 - **V Communications SystemSuite**

Device Drivers

- **Specialized programs that allow communication between a device and the computer**

- **Loaded into memory each time a computer is started**

- **When a new device is added, new device drivers must be installed**

Virus Protection and Internet Security

- **Internet Security Suite**
  - **Runs a number of programs**
  - **Continually monitors your computer**
- **VirusScan**
  - **Controls the frequency of searches for viruses**
  - **Quarantines or deletes infected files**
- **PrivacyService**
  - **Helps protect your privacy online**
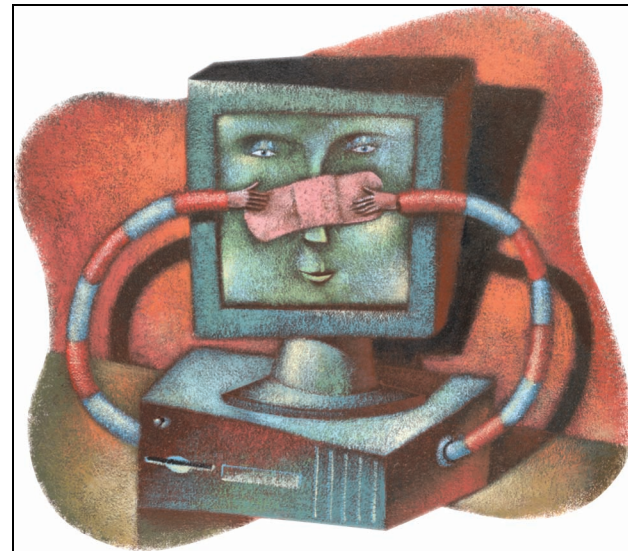 - **Block websites, cookies, and ads**

Careers In IT

- **Computer support specialist** provide technical support to customers and other users
- Resolve common networking problems and use troubleshooting programs to diagnose problems
- Employers look for a bachelors degree, good analytical and communication skills
- Computer support specialist can expect to earn $31K - $53K annually

A Look to the Future
IBM's Aware Supercomputer

- **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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Discussion Questions

- **Describe system software. What are the four types of system programs?**

- **What are the basic functions of every operating system? What are the three basic operating system categories?**

- **Explain the differences and similarities between Windows, Mac OS, and Linux.**

Discussion Questions (Page 2 of 2)

- **Discuss utilities. What are the five most essential utilities? What is a utility suite?**

- **Explain the role of device drivers. Discuss the Add Printer Wizard and Windows Update.**