

OPERATING SYSTEMS, UTILITY PROGRAMS, AND FILE MANAGEMENT

EGCO342 INFORMATION TECHNOLOGY IN DAILY LIFE



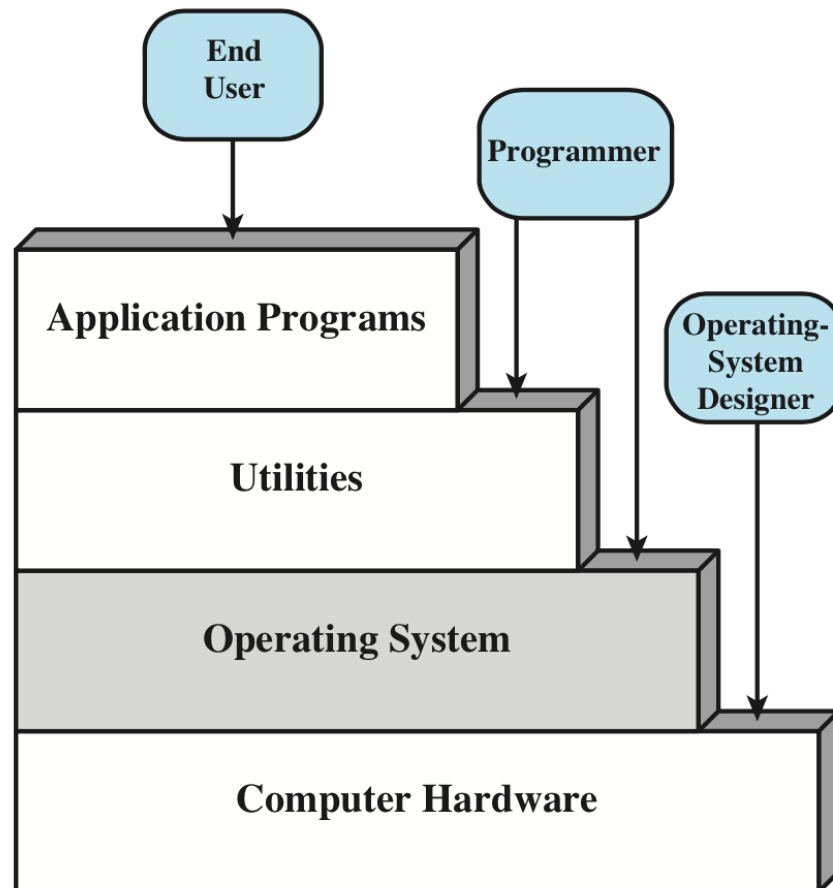
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System Software Basics

- Two basic types of software:
 - Application software is used to do everyday tasks at home and work
 - System software is set of programs that helps run the computer
 - Operating system is group of programs that controls how computer system functions
 - Utility programs are small programs that perform many general housekeeping tasks

Operating System (OS)

- Software that helps manage and control a computer.
- If you don't have it you can't run any other program at all.



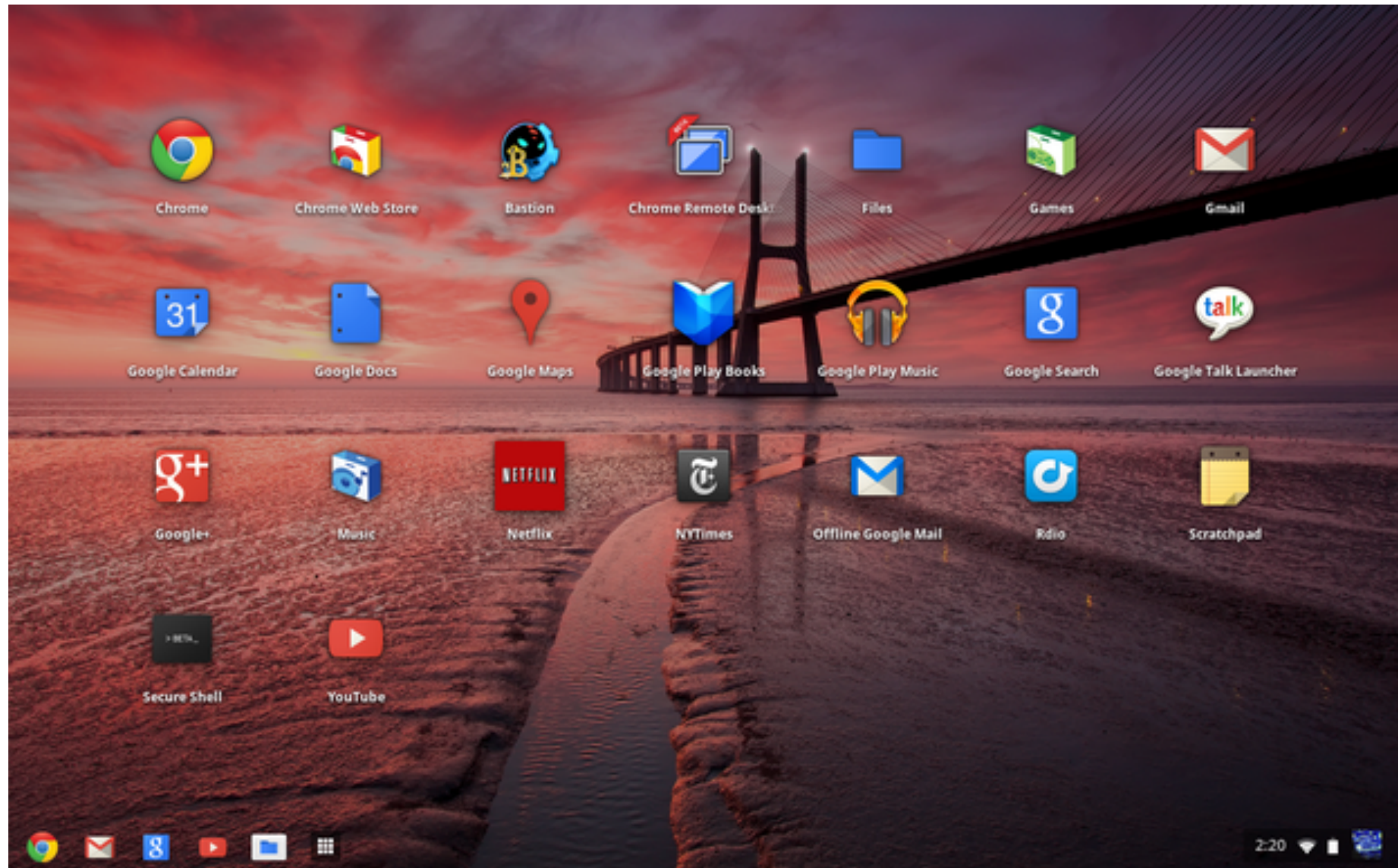
Operating System (OS)

- OS for Personal Computer
 - Windows (... , XP, Vista, 7, and 8)
 - Mac OS (... , Lion (10.7), Mountain Lion (10.8), ...)
 - Linux (Ubuntu, RedHat, Suse, CentOS, Fedora, and more.)
- OS for Mobile Devices
 - iOS
 - Android
- OS for Servers & Networks
 - Windows Server
 - Unix / Linux
- Other OS
 - Real Time OS (Car Engines, Medical Devices, Robot, and more.)

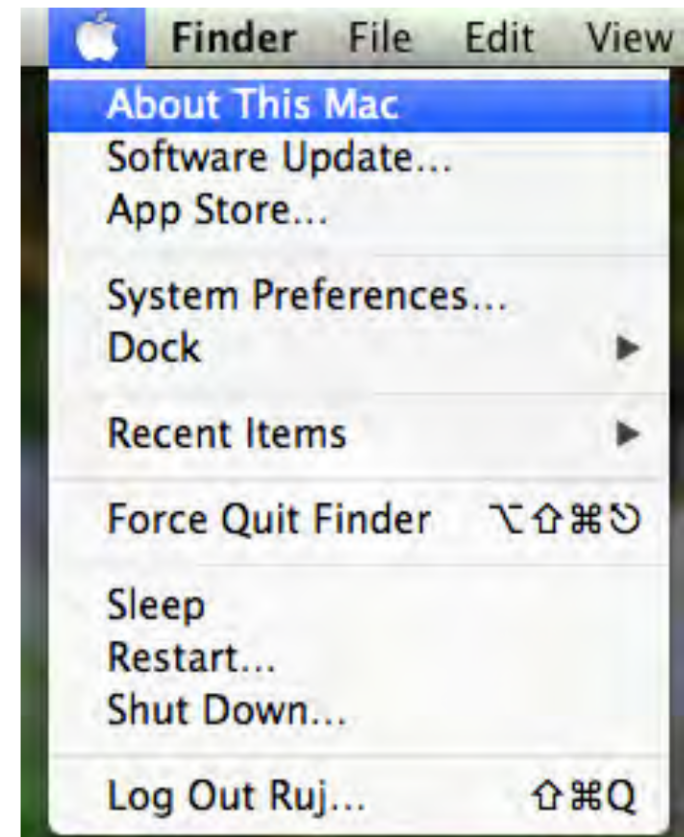
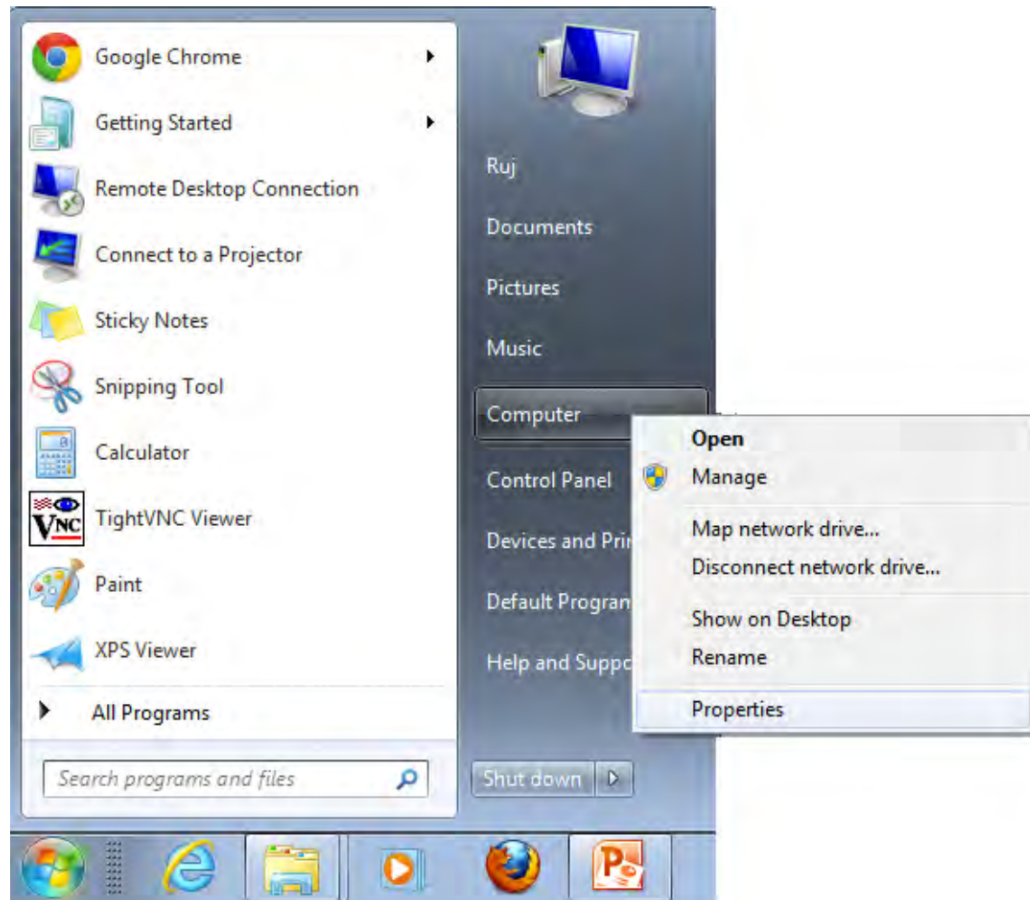
Web-Based Operating Systems

- Prototypes are being developed
- Still need a computer, operating system, and Web browser
- Enables users to access applications and content via the Web anywhere, on any machine and at any time
- Google is taking steps toward developing a complete Web-based operating system

Chrome OS and Chrome Book

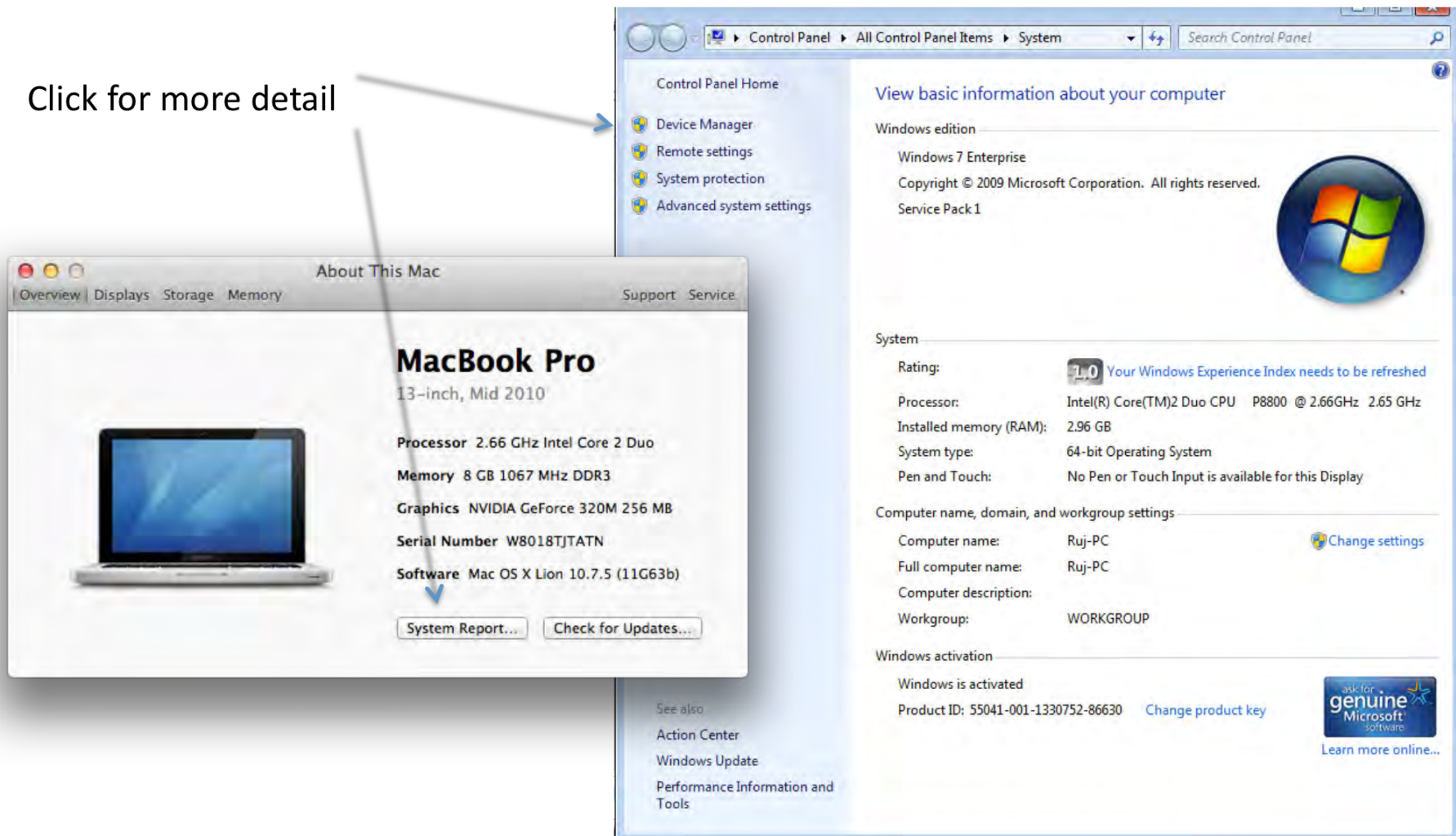


Know Your Computer (1)



Know Your Computer (2)

Click for more detail



Upgrading Your Operating System

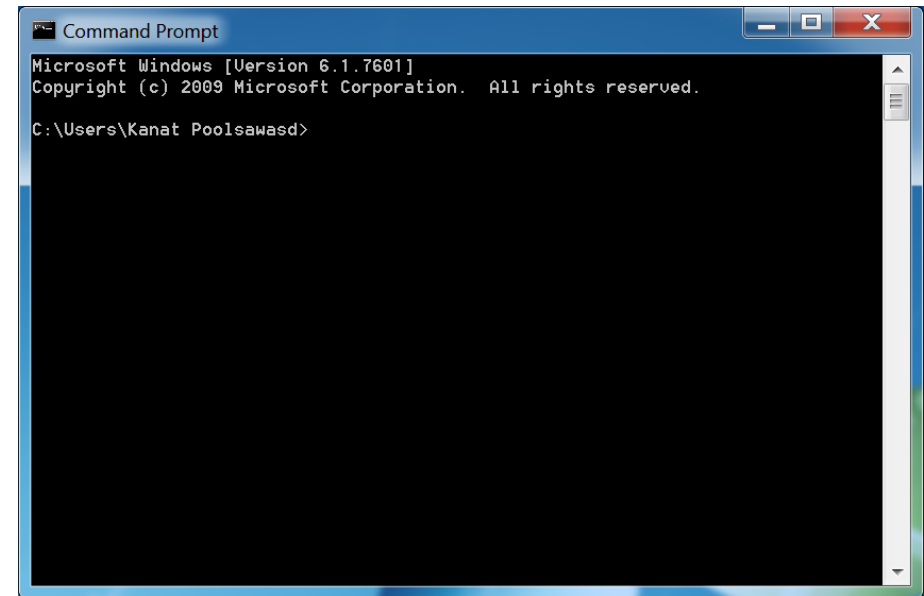
- Questions to ask before you upgrade:
 - Is current OS still supported?
 - Are there significant features in new version?
 - Will your hardware work with the new OS?
 - Is your software compatible with new OS?
- Back up all data files before starting upgrade.

What the Operating System Does ?

- Coordinates and directs the flow of data and information
 - Provides a user interface
 - Manages the processor, or CPU
 - Manages memory and storage
 - Manages hardware and peripheral devices
 - Provides means for software applications to work with the CPU

The User Interface

- Enables user to interact with the computer
- Types of interfaces
 - Command-driven interface
 - Menu-driven interface
 - Graphical user interface (GUI)



Processor Management

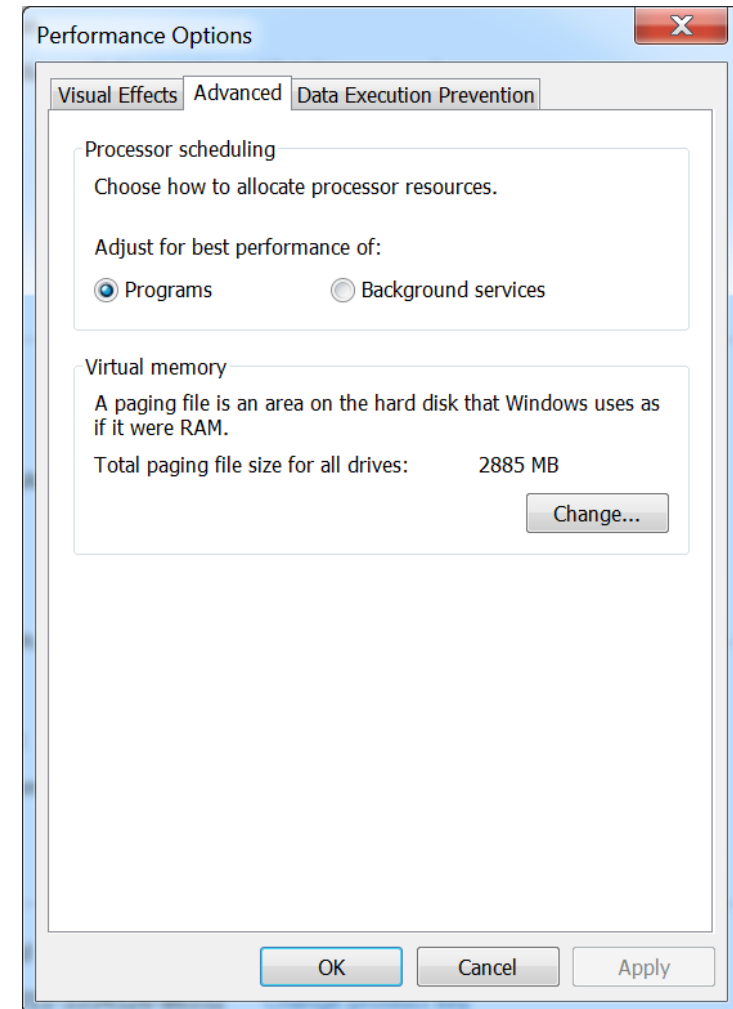
- CPU usually is asked to perform several tasks at once
- OS arranges for execution of all activities
- Assigns a slice of time to each activity
- Switches among processes millions of times a second
- Appears that everything is happening seamlessly

Memory and Storage Management

- OS uses RAM as temporary storage area for instructions and data
- Processor accesses these instructions and data from RAM when it needs them
- OS is responsible for coordinating space allocation in RAM
- Clears item from RAM when processor no longer needs them

Virtual Memory

- RAM has limited capacity
- When RAM is full, Instructions and data are stored on the hard drive



Hardware and Peripheral Device Management

- Device Drivers
 - Facilitate communication between device and the operating system.
 - Translates device's commands into commands the operating system can understand.
- Plug and Play
 - Hardware and software standard.
 - Facilitates the installation of new hardware.

Software Application Coordination

- For programs to work, they must contain code the CPU recognizes
- Application programming interface (API)
 - Blocks of code for similar procedures
 - Prevent redundancies in software code
 - Make it easier for software developers

The Boot Process: Starting the Computer

- The boot process loads the operating system into RAM
- Four basic steps:
 - BIOS is activated
 - A POST checks attached devices
 - The operating system is loaded into RAM
 - Configuration and customization settings are checked

BIOS (1)

- Basic Input/Output System (BIOS) and also known as the System BIOS, ROM BIOS or PC BIOS)
- Piece of software located inside the mainboard.
- Help detect components and start up the computer.
 - POST (Power-On Self-Test)



BIOS (2)



1 Keystroke to start the BIOS setup program

BIOS (3)

BIOS SETUP UTILITY					
Main	Advanced	H/W Monitor	Boot	Security	Exit
System Overview		Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.			
System Time		[04:13:04]			
System Date		[Sun 01/29/2006]			
BIOS Version : 775XFire-eSATA2 BIOS P1.00		Use [+] or [-] to configure system Time.			
Processor Type : Intel(R) Pentium(R) 4 CPU 3.00GHz (64bit supported)					
Processor Speed : 3014MHz					
Microcode Update: F43/5					
Cache Size : 2048KB					
Total Memory : 1024MB		↔ Select Screen			
Dual-Channel Memory Mode		↑↓ Select Item			
DDRII1 : None		+- Change Field			
DDRII2 : 512MB/200MHz (DDRII400)		Tab Select Field			
DDRII3 : None		F1 General Help			
DDRII4 : 512MB/200MHz (DDRII400)		F9 Load Defaults			
		F10 Save and Exit			
		ESC Exit			
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When We Need BIOS

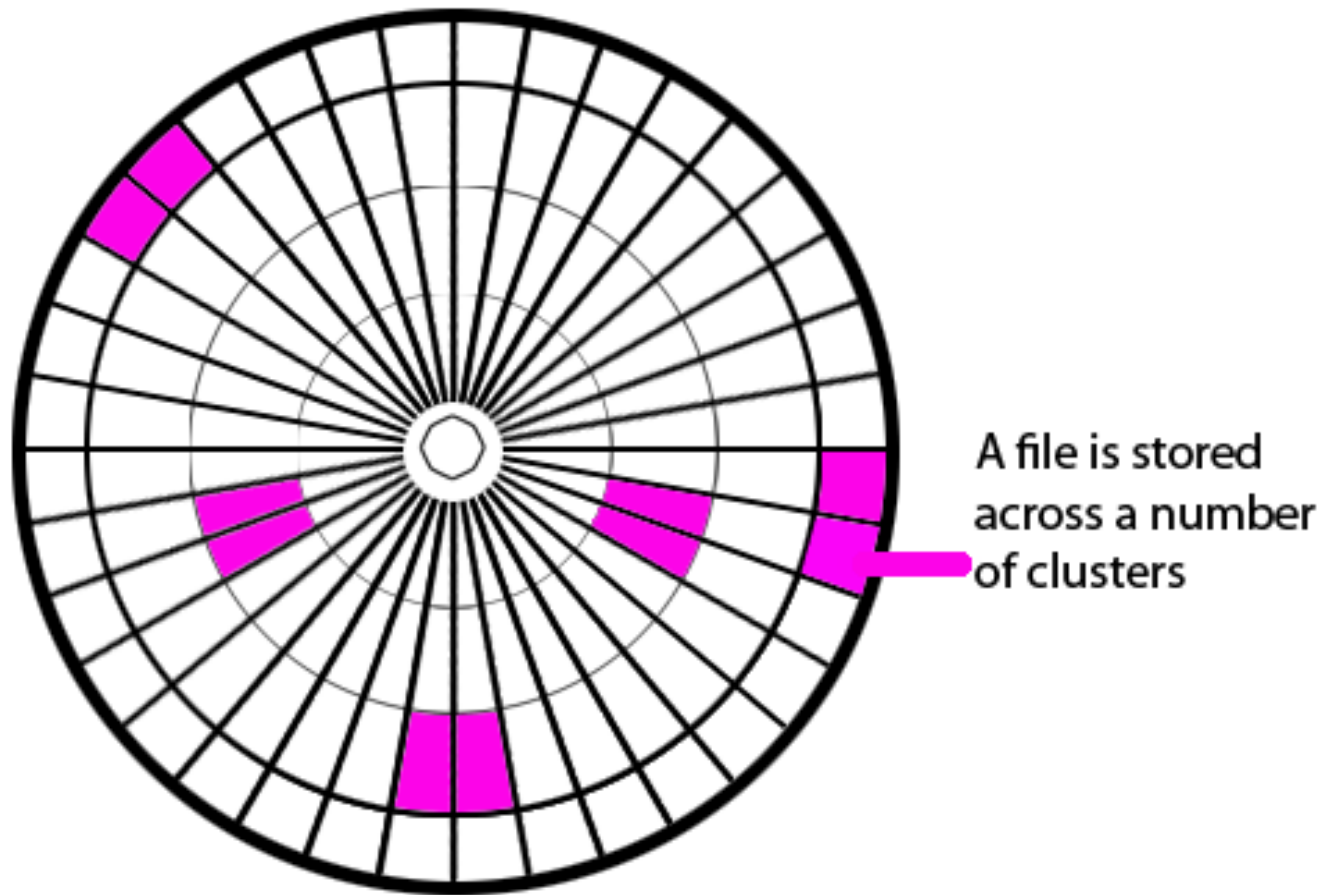
- Boot your PC from CD / USB
- Select a boot sequence
 - CD -> HD -> USB
 - HD -> USB -> CD

File Systems (1)

- If it's all 0/1 on the disk, how do we know where our file is!?
- File System is how OS tell where information are on the disk.
- Example: NTFS, EXT3, FAT16, FAT32

File Systems (2)

A file as stored on a hard disk



What is the Differences ?

File system	Maximum filename length	Allowable characters in directory entries	Total Files	Max file size	Max volume size
FAT16	8.3 or 255	Any byte except for values 0-31, 127 (DEL) and: " * / : < > ? \ + , . ; = [] (lowcase a-z are stored as A-Z). With VFAT LFN any Unicode except NUL	65,460	4 GB	2 - 4 GB
FAT32	UTF-16 code units with Long File Name		268,173,300		2 - 16 TB
NTFS	255		$2^{32}-1$	16 TB	256 TB
HFS+	Very long			Very big	Very big

Compatibility

- Fat 16, Fat 32 can be read/write by all
- NTFS read/write on Windows, Read only for Mac
- HFS+ read/write on Mac only.

Formatting

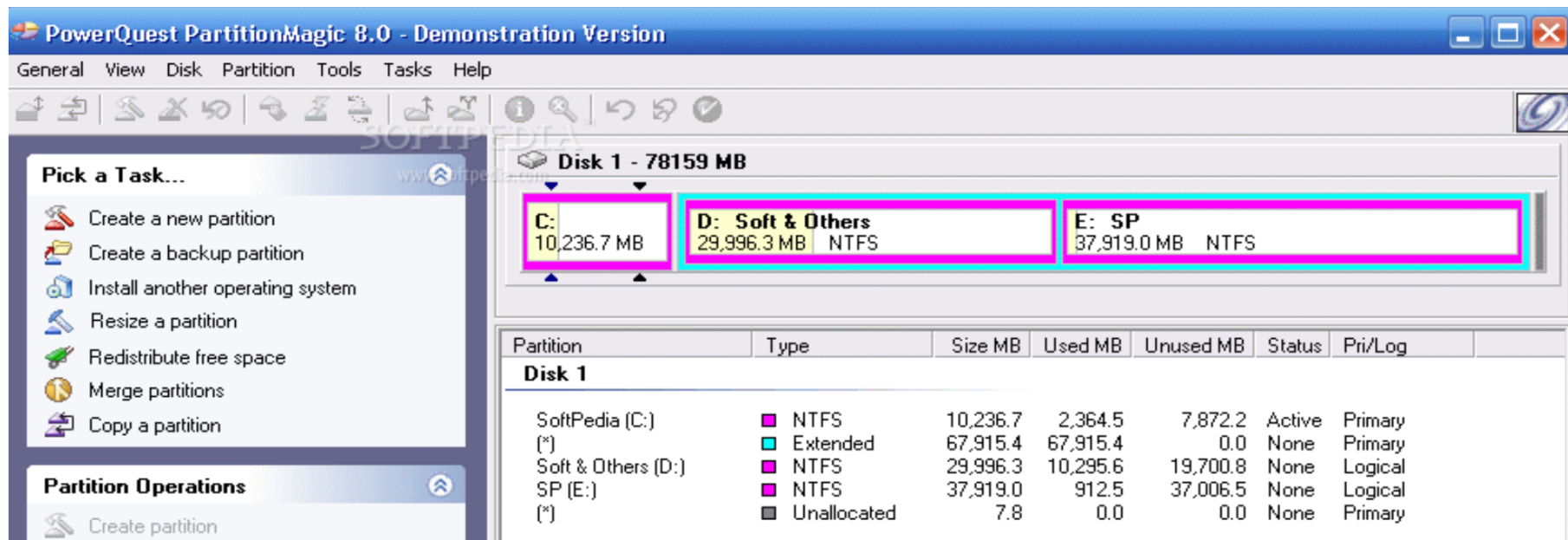
- Wipe all data from a hard disk/flash drive.
- Set file system.
- Try right click on a drive.
- Quick Format vs Normal Format
 - Quick = File directory system is destroyed.
 - Normal = Very Slow (Hours or Day) but check HD condition

Partitioning and File Systems (1)

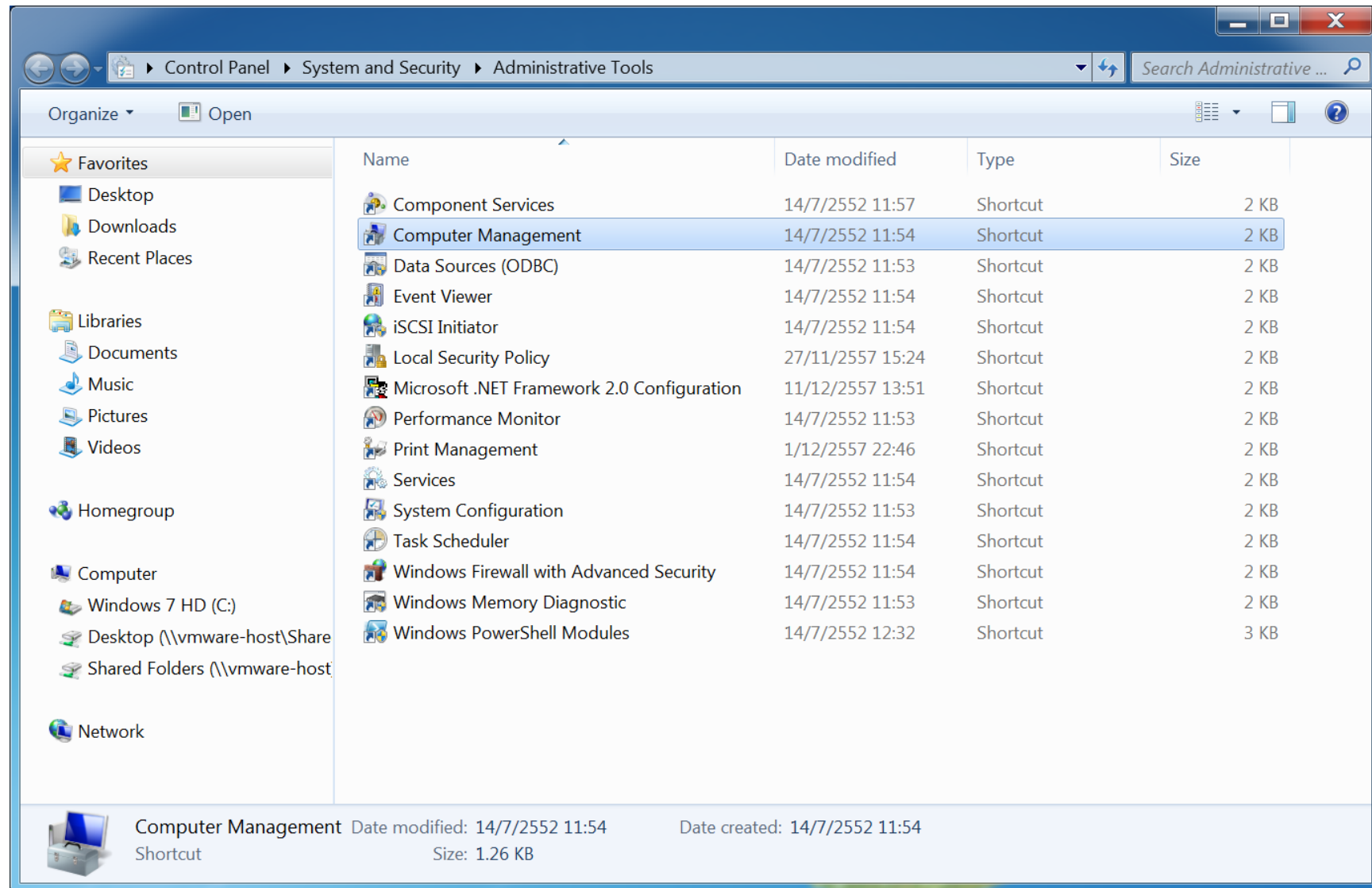
- Partitioning: Enables you to logically divide the physical capacity of a single drive into separate areas, called partitions or logical drives
- Used to:
 - Install more than one operating system.
 - Create a recovery partition.
 - Create a new logical drive for data.
 - Increase efficiency (smaller drives can use smaller cluster sizes)
- File system: Determines the cluster size, maximum drive size, and maximum file size
- FAT, FAT32, and NTFS

Partitioning and File Systems (2)

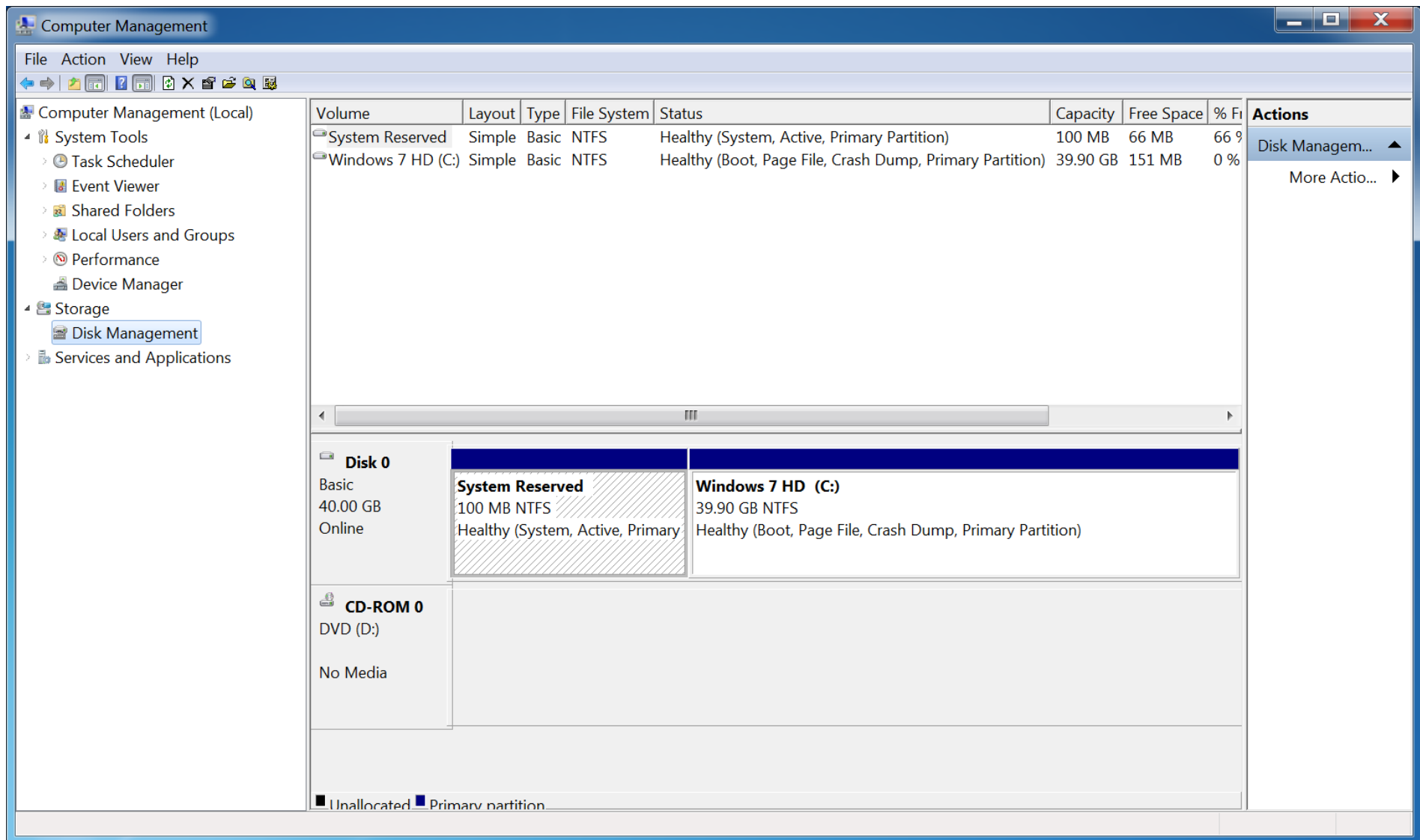
- Usually remove partition destroys ALL DATA.
- Windows has a tool for repartition that can shrink and expand without destroying data.
- Possible to use special software for repartitioning without losing data at all such as *Partition Magic*, *GNU Parted*, etc...



Partitioning and File Systems (3)



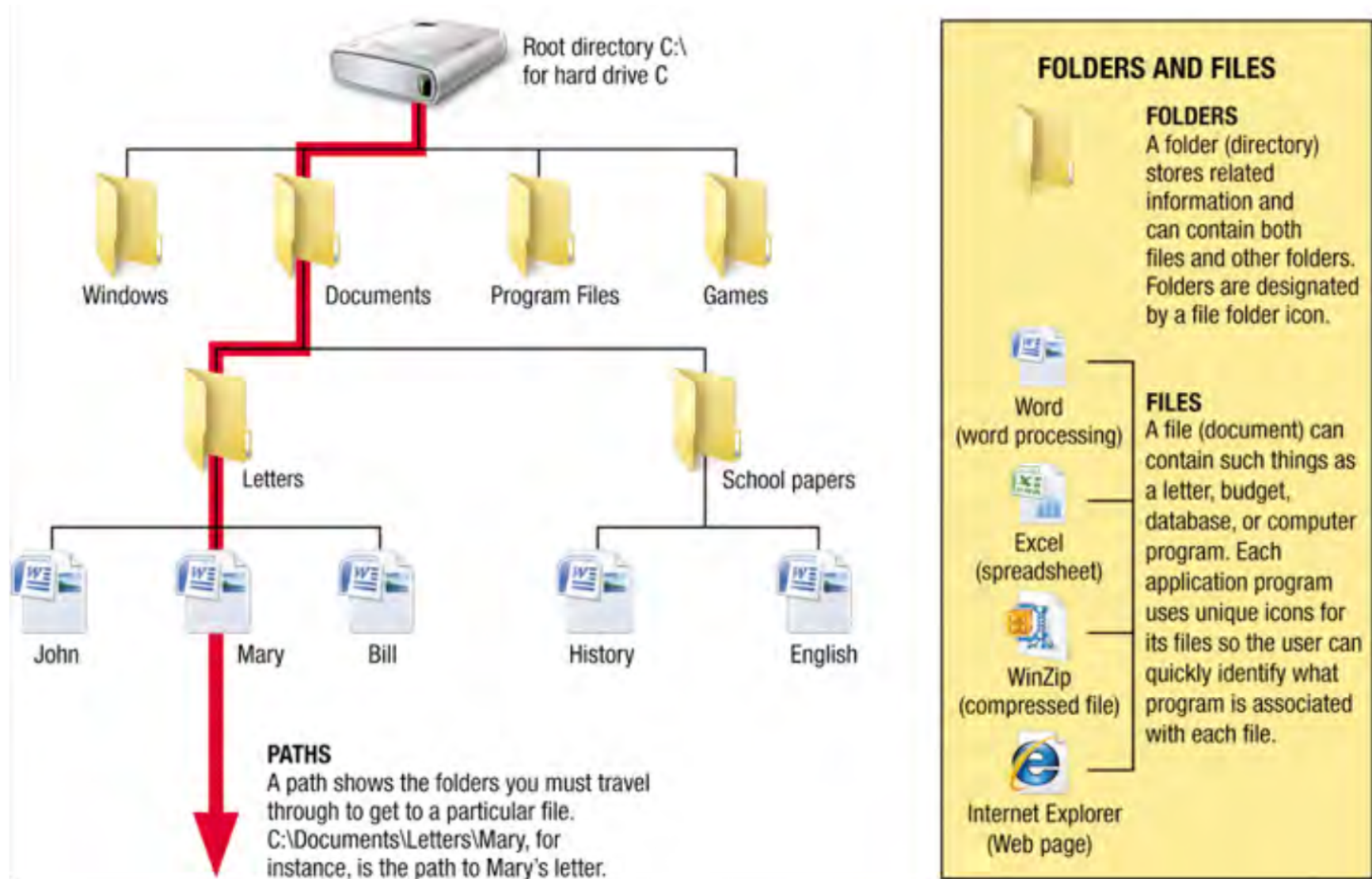
Partitioning and File Systems (4)



Why Partition ?

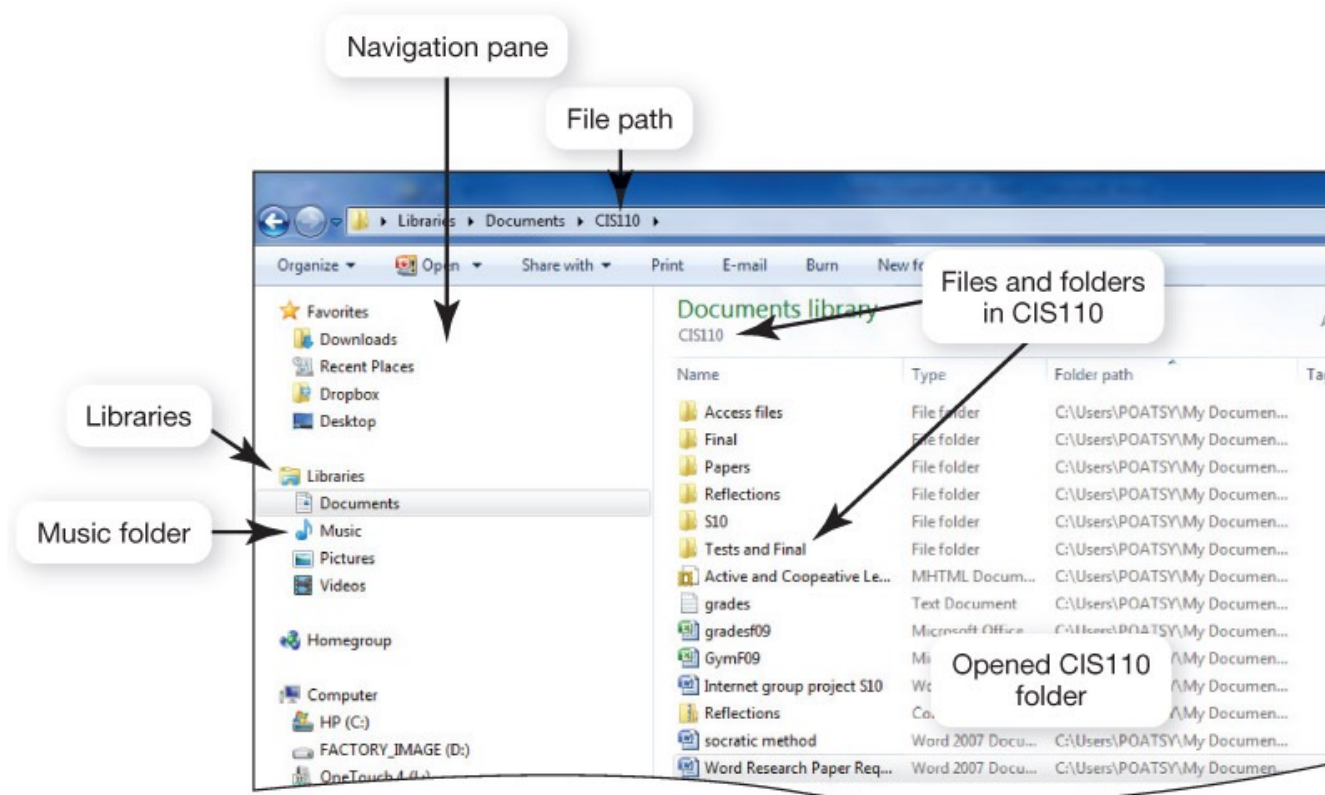
- Separate OS from data
 - OS on one partition and Data (Music, Word, etc) on another.
 - OS need certain free space for virtual memory.
- Have more than one OS on the same computer.

Files and Directories



Organizing Your Computer: File Management

- Additional function of the operating system is to enable file management
- Provides an organizational structure to the computer's contents.



Naming Files

- File name is the name you assign to the file when you save it
 - First part is similar to your first name
- In Windows, an extension, or file type, follows the file name and a period or dot (.)
 - Similar to a last name, extension identifies the application needed to read the file

Common File Name Extensions

Extension	Type of Document	Application
.doc	Word processing document	Microsoft Word 2003
.docx	Word processing document	Microsoft Word 2007 and 2010
.xlsx	Spreadsheet	Microsoft Excel 2007 and 2010
.accdb	Database	Microsoft Access 2007 and 2010
.pptx	PowerPoint presentation	Microsoft PowerPoint 2007 and 2010
.pdf	Portable Document Format	Adobe Acrobat or Adobe Reader
.rtf	Text (Rich Text Format)	Program that can read text documents
.txt	Text	Program that can read text documents
.htm /.html	Hyper Text Markup Language	Any program that can read HTML
.jpg	JPEG image	Programs capable of displaying images
.zip	Compressed file	WinZip

File Naming Conventions

- Each OS has own naming conventions
- Up to 255 characters
- Forbidden characters in Windows:
“ / \ * ? < > | :
- Mac file names may not use a colon (:), are case sensitive and do not need file extensions

File Path

- Determine location of a file by its file path
- File path includes drive, folders, subfolders, the file name, and the extension
- Path separators include a backslash (\) for Windows, or colon (:) for Mac



Working with Files

- File-management actions
 - Open
 - Copy
 - Move
 - Rename
 - Delete
 - Recycle Bin (Windows)
 - Trash (Mac)

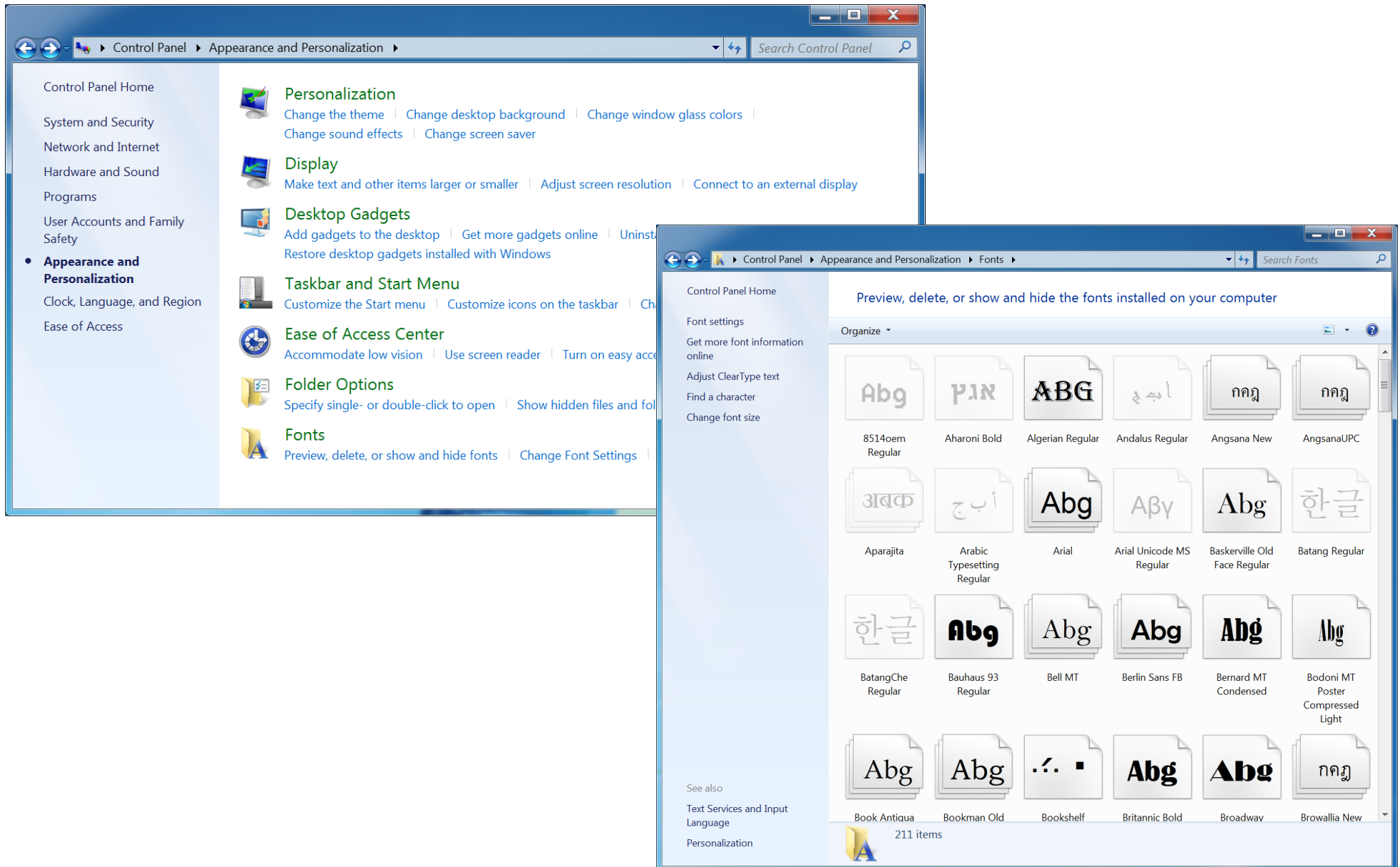
Utility Programs

- Small applications that perform special functions
- Some are incorporated into operating system
 - Firewall and file-compression utilities
- Stand-alone utility programs offer more features and require frequent updating
 - Antivirus and security programs

Display Utilities (1)

- Personalization has features to change the appearance of your desktop:
 - Background
 - Screen savers
 - Window colors
- Vast array of downloadable options are available on the Web.

Display Utilities (2)



The Programs and Features Utility

- Installing a new program usually runs a wizard automatically that walks you through installation
- Delete programs by:
 - Selecting the program's own uninstall option
 - Windows uninstaller utility

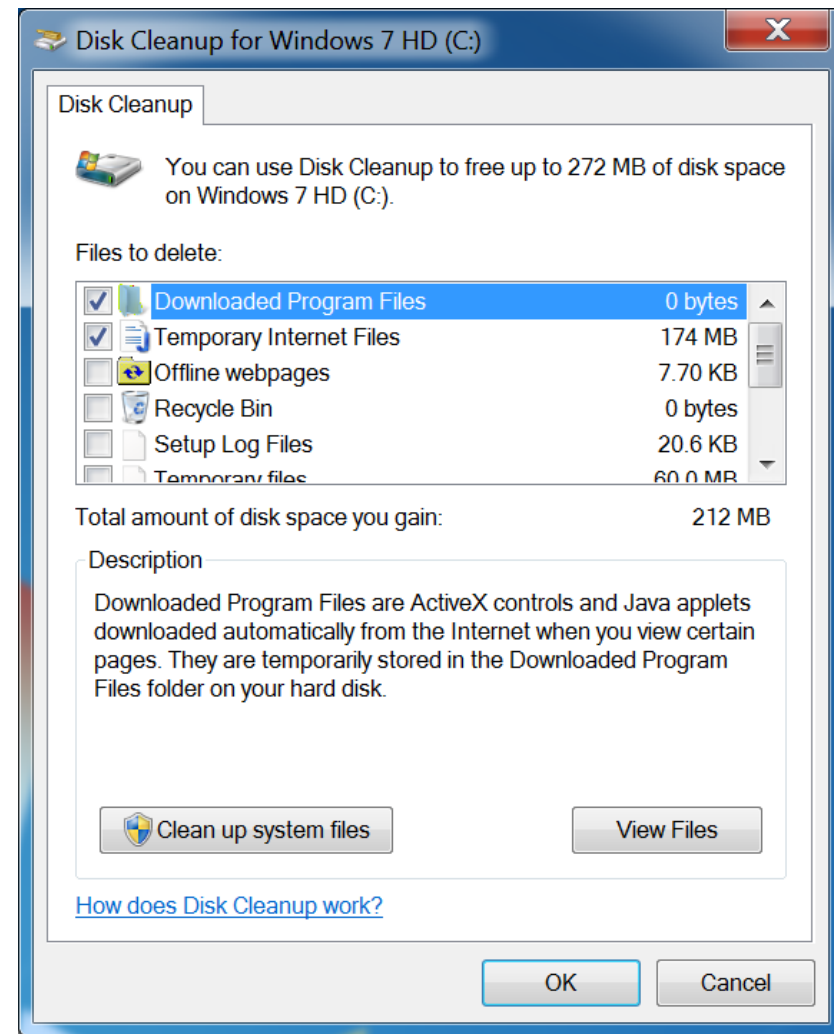
File Compression Utilities

- Makes a large file more compact
- Easier and faster to send over Internet
- Windows has built-in file compression
- Take out redundancies
- Look for repeated patterns

The rain in Spain falls mainly on the plain.

System Maintenance Utilities (1)

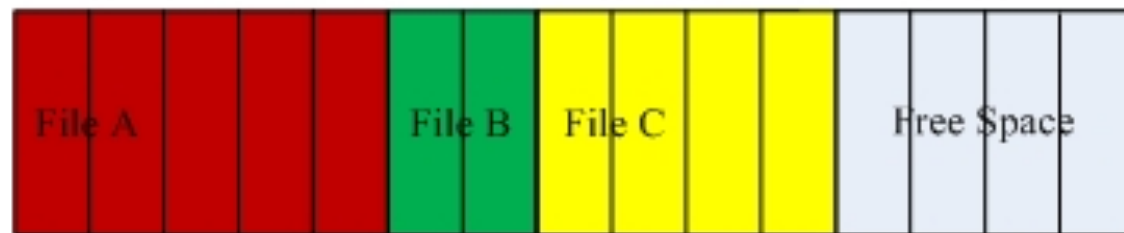
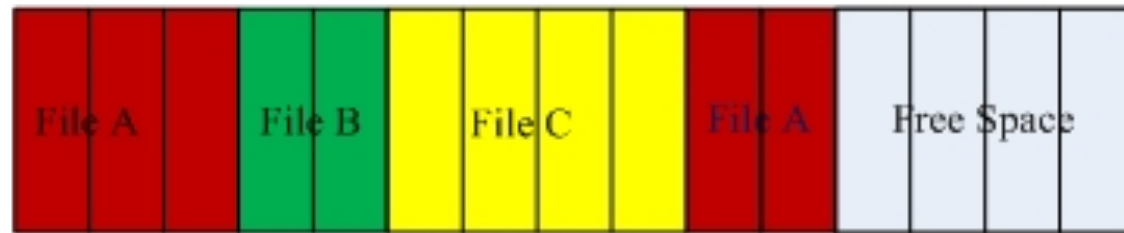
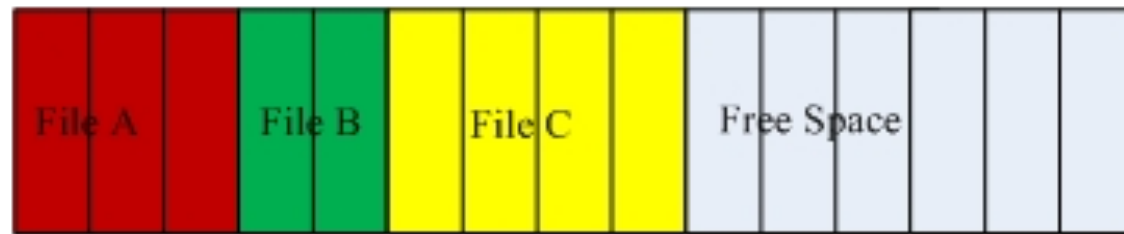
- Disk Cleanup removes unnecessary files
 - Recycle Bin
 - Temporary Internet files
 - Offline Web pages
- If not deleted, these files can hinder efficient performance



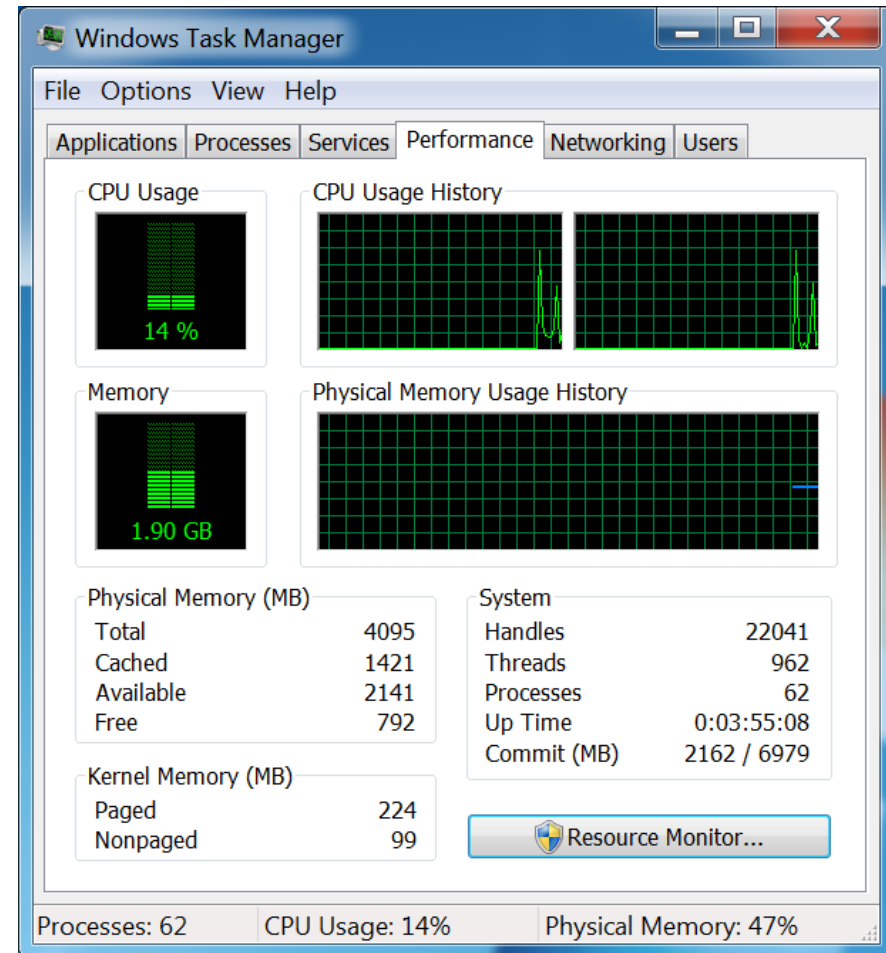
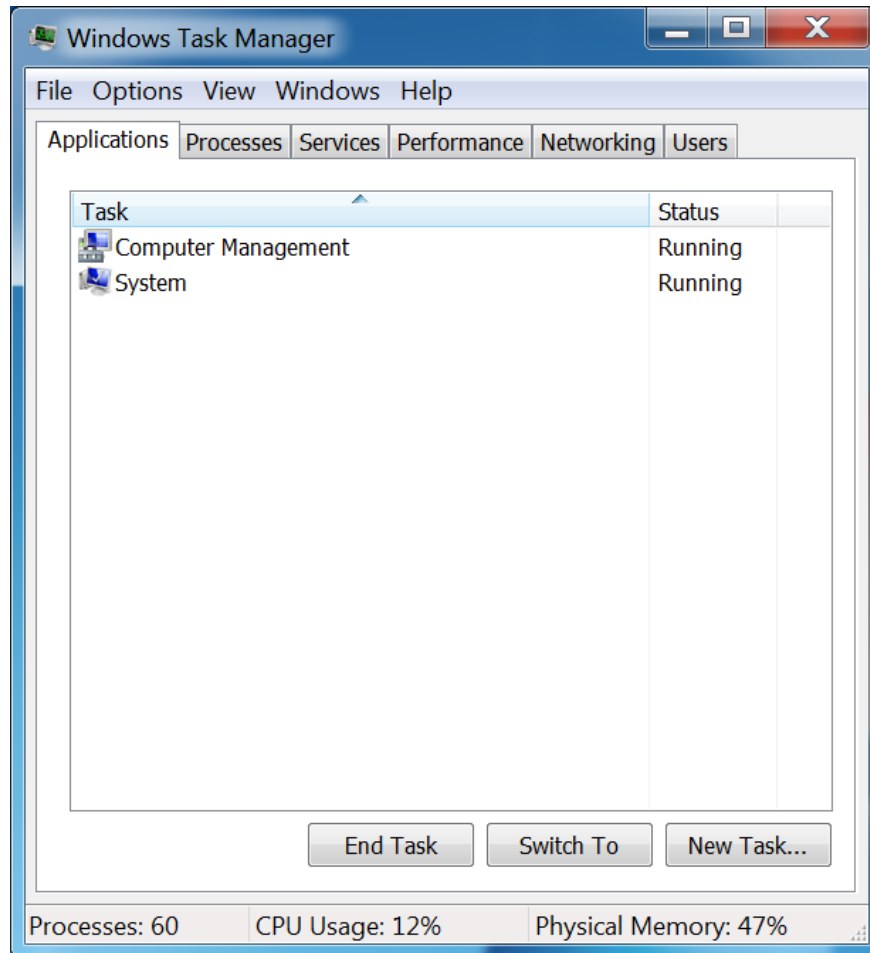
System Maintenance Utilities (2)

- Disk Defragmenter regroups related pieces of files on the hard disk
- Error-checking checks for lost files and fragments and physical errors on hard drive.
- Use Task Manager to check on program.
that has stopped working or to exit nonresponsive programs.

System Maintenance Utilities (3)



Task Manager Utility



Sleep and Hibernate

- Control Panel -> Power Options
- Sleep / suspend
 - Pause computer
 - Power out = lose everything
- Hibernate
 - Pause to hard disk.
 - Need space = memory.
 - Slower to start.
 - Safe from power out.

Working Remotely

