

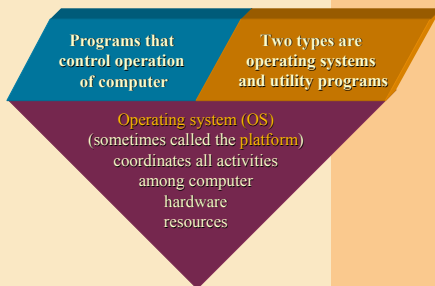
## Operating Systems and Utility Programs

## Operating Systems

Windows or Linux:  
Why many think Microsoft is evil?

## System Software

What is **system software**?



## Functions of An Operating System

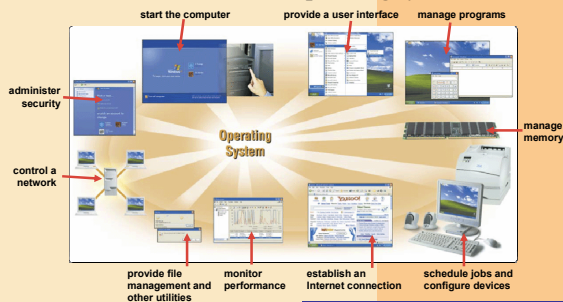
Also defined as "the **minimum** software layer that enables user and/or programs to **operate** the **hardware** parts."

**Four Major Functions:**

- CPU - Process management**
- RAM - Memory management**
- Storage - File system**
- I/O - Device drivers**

## Operating Systems

What are the functions of an operating system?



## Mode

**Command line**

- > DOS, Linux

**Graphical (GUI)**

- > Windows, Linux

**Finding a file for example**

- > Command-line vs. Graphical Mode

## Operating System Functions

### What is a **user interface**?

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



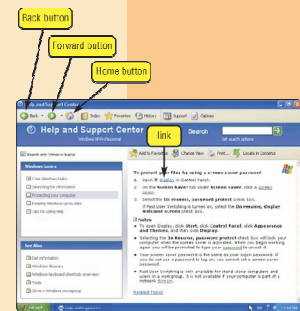
command-line (DOS) interface

graphical (Windows) interface

## Operating System Functions

### What is a **graphical user interface (GUI)**?

- User interacts with menus and visual images such as icons and buttons

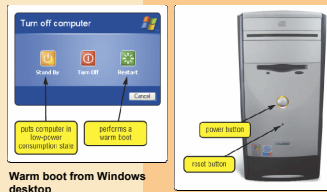


## Operating System Functions

### What is **booting**?

- Process of starting or restarting a computer

- **Cold boot**  
Turning on computer that has been powered off
- **Warm boot**  
Restarting computer that is powered on

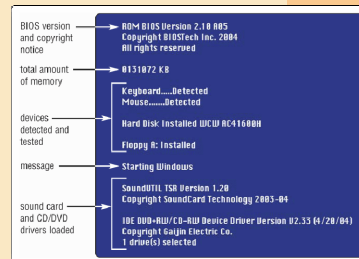


Warm boot from Windows desktop

Warm boot from system unit

## Operating System Functions

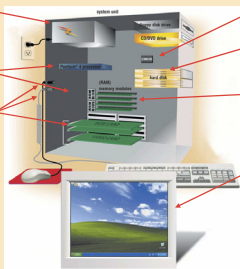
### What messages display on the screen when you boot the computer?



## Operating System Functions

### How does a personal computer boot up?

- Step 1.** Power supply sends signal to components in system unit
- Step 2.** Processor accesses BIOS to start computer
- Step 3.** BIOS runs tests, called the **POST**, to check components such as mouse, keyboard, and adapter cards
- Step 4.** Results of POST are compared with data in CMOS chip
- Step 5.** BIOS looks for system files in floppy disk drive and then hard disk
- Step 6.** **Kernel** (core) of operating system loads into RAM
- Step 7.** Operating system in memory takes control of computer
- Step 8.** Operating system loads configuration information and displays desktop on screen
- Step 9.** Operating system executes programs in StartUp folder
- Step 10.** Click Start to display list of applications you can run



## Boot strapping

A CPU is designed so that its program counter starts with a particular predetermined address each time the CPU is turned on.

It is at this location that the CPU expects to find the first instruction to be executed. This portion of memory is normally constructed in such a way that its content is permanent. – ROM

**Bootstrap:** the small program that is permanently stored at the above location.

## The booting process

