

# SOFTWARE TECHNOLOGIES

---

(August 31, 2016)

BUS3500 - Abdou Illia, Fall 2016 1

---

---

---

---

---

---

---

---

## LEARNING GOALS

---

- ▣ Identify the different types of **systems software**.
- ▣ Explain the main functions of **operating systems**.
- ▣ Know the various types of **application software**.

2

---

---

---

---

---

---

---

---

## Example of Computer configuration

---

- ▣ Intel® Pentium® 4 Processor 540 (3.20GHz)
- ▣ 2GB SDRAM PC3200 (800MHz), Dual Channel
- ▣ 750GB Serial ATA 7200rpm Hard Disk Drive
- ▣ 16x Multi-Format DVD Writer (DVD±R/±RW)
- ▣ Gateway 7-Bay Tower Case
- ▣ Integrated Ultra ATA Controller
- ▣ (1) PCI-E x16 Expansion Slot, (1) PCI-E x1, (3) PCI in which 2 are available for use
- ▣ (7) USB 2.0 (6 in back and 1 in front in the media card reader), (2) IEEE 1394 Firewire Ports, Parallel, Serial and (2) PS/2
- ▣ 20" Black LCD Flat Panel Display (19" viewable)
- ▣ Gateway Premium 104+ Keyboard
- ▣ Two-Button PS/2 Wheel Mouse (no mouse pad included)
- ▣ Napster 2.0 and 150 Song Sampler
- ▣ Intel® High Definition Audio
- ▣ GMAX 2100 2.1 Speakers with Subwoofer
- ▣ 56K PCI data/fax modem
- ▣ 10/100/1000 (Gigabit) Ethernet
- ▣ Microsoft Office 2007 on CD

Processing
I/O
Output
Input

3

---

---

---

---

---

---

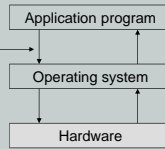
---

---



## Operating System (OS)

- ❑ Software platform on which other programs run
- ❑ Provide a **connection** or **interface** between application programs and the computer hardware
- ❑ Major tasks
  - Starting the computer
  - Managing files
  - Managing Programs and Memory (RAM)
  - Ensuring security
  - Providing a user interface
  - Control input and output devices



7

---

---

---

---

---

---

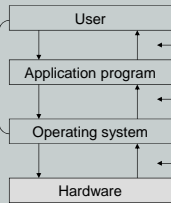
---

---

## How OS work?

- ❑ OS: routines that sits between application programs and hardware to provide:
  - Interface function
  - Key support services

**Examples of support services:**  
 -Communications w/peripheral devices  
 -Launching a program  
 -Copying a file  
 -Creating a directory  
 -Opening a file



- ❑ User communicates w/App. Prg.
- ❑ App. Prg communicates w/OS
- ❑ OS communicates w/Hardware
- ❑ All App. Prg access Hardware through OS according to rules imposed by OS

8

---

---

---

---

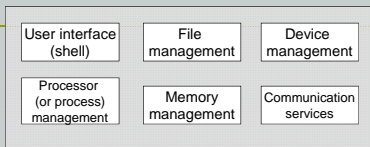
---

---

---

---

## OS: Primary components



<b>Shell</b>	Provides mechanism for user and App. Prg to communicate w/OS and request OS support
<b>File management</b>	Allows the user to create, delete, modify, and manipulate files.
<b>Device management</b>	Controls communications w/peripheral devices
<b>Processor management</b>	Manages processor's time
<b>Memory management</b>	Manages system's memory
<b>Communication services</b>	Manages comm. Between OS layers and intercomputer communications.

9

---

---

---

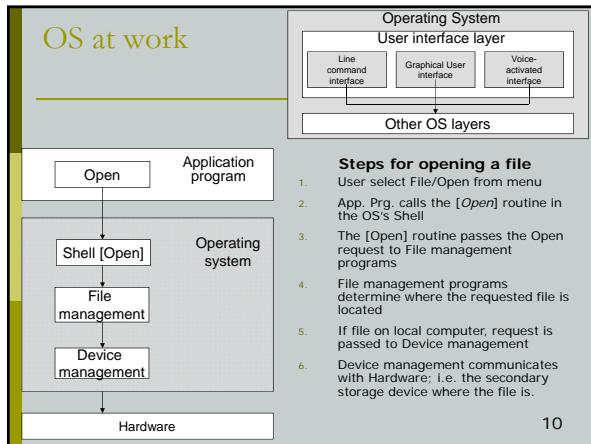
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

### OS: Managing Files

- OS keeps track of where all files are located
- Manage disk space usage
  - Free space
  - Used space
- Creates and manages directory structure

11

---

---

---

---

---

---

---

---

---

---

### OS: Program and Memory Management

- OS is responsible for
  - Sending programs to the CPU
  - Allocating primary storage (RAM) to programs
  - Controlling devices that programs requires
- Multiprogramming and Multitasking
  - More than one program in memory at once
  - OS keeps track of memory for each program
  - One program runs until it needs data from the user, then the OS switches to the other program
- Virtual memory
  - "Extending" the computer RAM by using secondary storage
  - Used when RAM insufficient to hold programs to be used

12

---

---

---

---

---

---

---

---

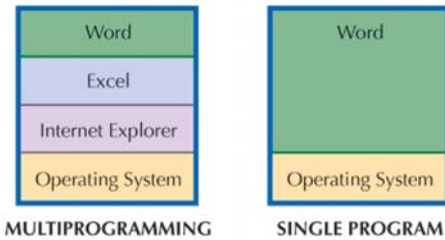
---

---

## OS: Multiprogramming

- Ability of the OS to allow running multiple program "at the same time"

**Figure 3.3** Multiprogramming



13

---

---

---

---

---

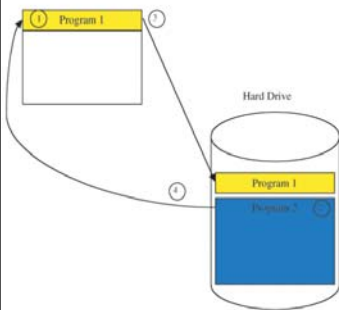
---

---

---

## OS: Virtual Memory

**Figure 3.4** Virtual Memory  
Memory (RAM)



- A technique that "extends" primary memory (RAM) by using secondary storage devices
- Needed when there is not enough RAM to hold multiple programs in memory
- There need to be enough free disk space for virtual memory to work.

14

---

---

---

---

---

---

---

---

## OS: Security

- All modern OS provide system security
  - Access control
    - Who has access to the computer?
  - File permissions
    - Read and/or Modify permissions on files
  - Logging, i.e. auditing the computer
    - Records Who has accessed the computer
    - Records What actions they performed

15

---

---

---

---

---

---

---

---



## Summary Questions

	Notes
1) What are the two main types of software?	5
2) What are the three types of systems software?	5
3) What are the main functions of an operating system?	7
4) (a) Name some Operating Systems. (b) Name some Application software programs.	6,16
5) What does Multiprogramming mean?	12,13
6) What does virtual memory mean?	12, 13
7) What are utility programs used for?	18

---

---

---

---

---

---

---

---