

Basic Concepts of Computers

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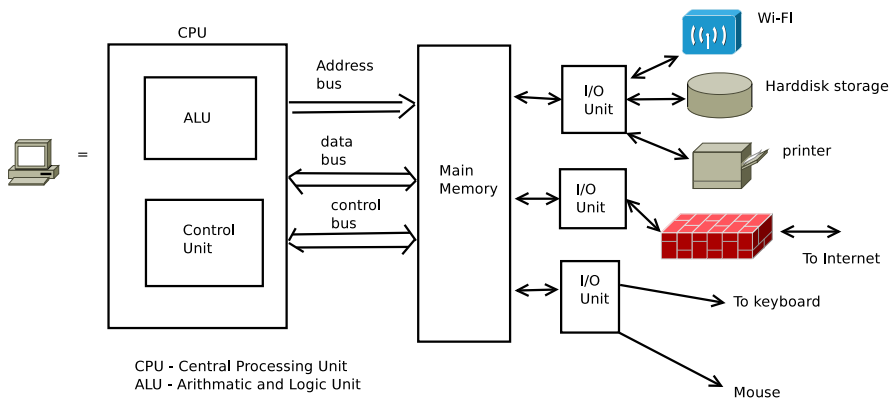
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- ▶ What is a Computer?
- ▶ Software and Hardware
- ▶ Hardware Components
- ▶ Hardware Accessories
- ▶ System Software
- ▶ Software Applications

- ▶ **What is a Computer?**

Computers are not very intelligent devices, but they handle instructions flawlessly and fast. They must follow explicit directions from both the user and computer programmer. Computers are really nothing more than a very powerful calculator with some great accessories. Applications like word processing and games are just a very complex math problem.

Components of Computer:



▶ Hardware v/s Software

1. If you use a player piano as an analogy, the piano can be thought of as the hardware and the roll of music as the software.
2. The software a series of very simple computer instructions carefully organized to complete complex tasks. These instructions are written in programming languages (like C, C++, Java, ...) to help simplify the development of applications.
3. The hardware is what sits on your desk and executes the software instructions. The player piano is useless unless the roll of music has been written correctly.

▶ Hardware Components

1. **Input Devices** – “How to tell it what to do”
 - A keyboard and mouse are the standard way to interact with the computer. Other devices include joysticks and game pads used primarily for games.
2. **Output Devices** – “How it shows you what it is doing”
 - The monitor (the screen) is how the computer sends information back to you, whether it be surfing the web or writing a memo. A printer is also an output device.
3. **Storage Devices** – “How it saves data and programs”
 - Hard disk drives are an internal, higher capacity drive which also stores the operating system which runs when you power on the computer.
 - “Floppy” disk drives allow you to save work on small disks and take the data with you.

▶ Hardware Components

1. **Memory** – “How the processor stores and uses immediate data”
 - When you use a program, the computer loads a portion of the program from the hard drive to the much faster memory (RAM). When you “save” your work or quit the program, the data gets written back to the hard drive.
2. **Microprocessors** – “The brain of the computer”
 - 2.1 PCs primarily use microprocessors (sometimes called the chip) manufactured by Intel. The older Intel versions include the 386, 486 and now the Pentium line.
 - 2.2 Macintoshes use PowerPC processors by Motorola.
 - 2.3 Megahertz (MHz) is the internal processor speed in which computer instructions are performed. The MHz speed does not always indicate the power of the microprocessor. Newer processors can execute more instructions at the same or slower MHz. For example, an Intel 486 100MHz is less powerful than a Pentium 75 MHz (but the MHz is “faster”).

Hardware Accessories

1. **Modems:** Modems allow you to communicate with other computers using a phone line. Modem speeds are in bits per second (14.4, 28.8 and 56 thousand bits per second are standard)
2. **CD-ROM Drives**
 - A CD-ROM drive is a high capacity storage device which lets you read data from the disk, but not write data back. The speed of the drive (how fast the CD platter spins) is measured in multiples from the first generation drives. New drives are up to 24X (or 24 times the first drives), but while the CD spins faster, it is not really 24 times faster in actual output. New Devices are **Pen Drives**

Hardware Accessories

1. Printers

- There are different types of printers (laser, ink jet, dot matrix) with differing quality of output. They are measured in dpi (dots per inch) and ppm (pages per minute), the higher the better.

2. Scanners

- Scanners “digitize” printed material (like photos and graphics) and save it to a graphic file format (like .GIF or .JPG) for display on the computer

▶ System Software

1. Operating system software provides a “user interface” for users to manage files, start programs, customize computer settings, and other tasks. The operating system also provides the fundamental core computer functionality for programmers.
2. Intel based PCs use Microsoft Windows version XP (older), Windows VISTA, Windows 7, Windows 8 as the operating system. Macintosh use the Macintosh operating system. Linux with many flavors: Ubuntu, Debian, RedHat, ...
3. Compilers for various languages: C, C++, Java, ...

▶ Application Software

Application software uses the operating system software and provides the real functionality of a computer. Applications include: (next slide)

Application Software: Text editing, Word processing, Desktop publishing Software

1. Simple text editors: notepad, vi, gedit, Formats: .txt
2. Word Processing (MS Word 2000, MS Word 2007, MS word 2010), formats: .rtf, .doc, .docx
3. Scientific Publication Software: Latex, Miktek, Lyx, kile . . .) (for research articles, books, and dissertation). File extensions: .tex, .tex, .lyx, .tex (Can also create files in .ps (post scripts), .pdf (portable document format)
4. PageMaker (Available in MS Windows, for High Quality Text Editing and Desktop Publishing)
5. Spreadsheets (Excell,) File .xls, .xlsx (can also save in .csv, .html, .dbf)
6. Presentation creation (MS PowerPoint, . . .) (file: .ppt, .pptx)
7. Acrobat Reader for pdf (portable document format) files (.pdf)

▶ Graphical Packages

1. Graphics (bitmap/pixels and vector/object or mixed)
2. file formats: .bmp, .jpg, .svg, .eps, .tif, tiff, .png (Joint Photographic Experts Group, Tagged Image File Format, Portable Network Graphics)
3. Image Editor: Adobe Photoshop (in Windows environment), Gimp: (in linux)
4. Graphical Editor Packages: Latexdraw (.svg, .ps, .eps, .jpg, ...) in Linux
5. Diagram Editor Package: .dia (in Linux and Windows), can export files into other formats

▶ Text editing, Word processing, Desktop publishing Software

1. Simple text editors: notepad, vi, gedit, ... (Formats: .txt)
2. Database (MS Access, Fox Pro, Oracle, ...)
3. Internet Browsers (MS Internet Explorer, Firefox, ...)
4. Search Engines: Google, Yahoo, ...
5. Email Applications
6. Games

1. Computer Hardware v/s software
2. Software: System Software and Application Software
3. Documentation Tools
4. Image editing and creation tools