Computers and Computer System

A computer is an electronic device that processes data.

A computer system is made up of four parts:

* **User** (The person working on the computer.)
* **Hardware**: (the physical components of the computer)
  + The **purpose** of hardware is to get data into the computer, to process the data, and to produce results. Processing components convert raw data into information.
    - **Central Processing Unit** (CPU) processor or “brain” of the computer
    - **Memory:** The computer stores data it is currently processing in random-access memory (RAM). It is primary storage and temporary. The more RAM a computer has, the faster it can process data.
    - **Input and Output Devices**
      * Types of input devices: keyboard, mouse, joystick, scanner, digital cameras, microphone used to enter data into a computer.
      * Types of output devices: monitor, printer, speakers lets users examine the results of processed data.
    - **Storage Devices:** secondary storage device to save data for long term, usually measured in megabytes or gigabytes. (hard drive, CD/DVD, flash drive)
* **Software**
  + Computer software gives instruction to the computer’s hardware to make it work.
  + Three main categories of software:
    - **Operating Systems Software (OS)** controls all other software programs on the computer. Most common are Microsoft Windows and Macintosh. An OS is responsible for keeping track of everything the computer does (task management), moving data between RAM and other storage devices (memory management), keeps track of input devices, and sends output to the appropriate hardware. An OS provides an interface through which a user gives commands to the computer using graphical user interface (GUI).
    - **Application Software** perform different tasks on the computer
      * **Web browser**: use to visit Web sites on the Internet (translate the text-based Hypertext Markup Language (HTML) used to create Web pages into a graphical Web page and lets user move or navigate from one Web page to another); examples are Microsoft Internet Explorer, Apple Safari, Netscape, or Mozilla Firefox.
      * **E-mail:** use to exchange messages and files with other computers; examples are Microsoft Outlook, Eudora, or Outlook Express.
      * **Word processing:** use to create documents such as letters, reports, and newsletters; examples are Microsoft Word, Corel, or WordPerfect.
      * **Spreadsheet:** use to work with numbers and calculates to create tables, charts, and graphs; examples are Microsoft Excel or Lotus1-2-3.
      * **Database:** use to organize and retrieve large amounts of information; examples are Microsoft Access, FileMaker Pro or Oracle.
      * **Presentation:** use to create a slide presentation; examples are Microsoft PowerPoint, Apple Keynote, or MS Producer.
    - **Utility Software:** helps you control your computer and keep it in good running condition; examples are antivirus and security programs such as McAfee or Symantec.
* **Data**
* **Note:** Your computer’s hardware, operating system, and application programs must all work together in order for your computer to function properly. When computer components work together properly, they are said to be **compatible**. The Windows and Macintosh operating systems are generally **incompatible.**

**Network** connects computers together.

**Types of Network configurations**

* Local area network (LAN) connects computers in a single location.
* Wide area network (WAN) connects computers across a wider geographical area.

Cost, speed, and convenience are three factors that many people consider when choosing an internet connection.

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| Types of Internet Connections | | | |
| Type of Connection | How it Connects to the Internet | Advantages | Disadvantages |
| Dial-up | * Modem * Standard telephone line | * Inexpensive * Requires no additional hardware | * Slow transmission rate * Can disconnect suddenly |
| Broadband | * Hardware provided by Internet service provider (ISP) * Cable television equipment, satellite dish, or dedicated telephone line | * Computer always connected to the Internet so access is instantaneous * Faster transmission rate | * Transmission rates vary * Typically more expensive than dial-up * Continuous Internet connection makes computer more vulnerable to viruses, spyware, and hackers |
| Wireless | * Infrared waves, radio waves, or microwaves | * Very mobile and convenient since no cables or cords are used * Internet can be portable | * Not every location has wireless accessibility * Suited to small areas * Not as reliable as traditional connections |

**To send and receive data** over the Internet, three components are necessary: hardware (computer, PDA, or some cell phones), software (operating system), and an internet connection (dial-up, DSL, cable, wireless connection). An Internet Service Provider (ISP) is a business that allows its customers’ computers to access the Internet through its own network for a fee. Examples are Midcontinent, Knology, AOL, and EarthLink.

**Internet Protocols**

All of the different computers on the Internet must communicate with each other to share information and resources. A protocol is a set of rules and procedures specifying how data need to be formatted and transmitted between computer systems. The basic Internet protocol is Transmission Control Protocol/Internet protocol (TCP/IP). Each computer on the Internet has a numeric Internet protocol or IP address. Other commonly used protocols are HTTP, FTP, Telnet, Gopher, and WAIS.

**Bandwidth** determines the amount of data that can be transmitted to your computer via the internet. The higher the bandwidth the faster the data can be transmitted. Cable transmits data 100 times faster than dial-up, and a T3 line can transmit data about one thousand times faster than dial-up. **SI Prefixes** are Kilo for 1,000, Mega for 1,000,000, Giga for 1,000,000,000, and Tera for 1,000,000,000,000.

**Origin of the Internet**

1969: first version of the Internet created by the government called ARPANET

1980’s: The National Science Foundation adds to ARPANET and calls it the Internet.

1990: Tim Berners-Lee creates first GUI (graphical user interface) and names it the World Wide Web.

1994: Web’s governing body; the World Wide Web Consortium is founded.

1995: Private networks are joined to the Internet