

CPA BEC - STUDY UNIT 12

Information Technology II: Core Concepts

A. HARDWARE

1. The **central processing unit (CPU)** is the “brain” of any computer. In a desktop computer, it is often referred to as the microprocessor. **Random access memory (RAM)** is also referred to as main memory or primary storage. **Read-only memory (ROM)** is permanent storage used to hold the basic low-level programs and data. **Secondary storage devices** hold data and programs that are not currently being used by the CPU, e.g., hard drives. **Input-output devices** are the hardware components that allow the user to input data into the computer and retrieve output, e.g., keyboard, mouse, monitor.

B. SOFTWARE

1. **Software** refers to the programs (i.e., sets of computer instructions) that are executed by the hardware. Software can be described from two perspectives: (a) systems vs. application software and (b) the programming language in which the software is written.
2. **Two major types of software.** **Systems software** performs the fundamental tasks needed to manage computer resources (operating system and utility programs). **Application software** consists of programs that tell the computer what steps the user wants carried out (e.g., word process).

C. NETWORKS

1. Improvements in technology have led to increasing **decentralization** of information processing. **Distributed processing** involves the decentralization of processing tasks and data storage and assigning these functions to multiple computers, often in separate locations. This need led to the development of the **local area network (LAN)**. A LAN is any interconnection between devices in a single office or building. The most cost-effective and easy-to-administer arrangement for LANs uses the **client/server model**.
2. **Networks** can be classified by geographical extent and function.
 - a. A **local area network (LAN)** connects devices within a single office or home, or among buildings in an office park. The key aspect here is that a LAN is owned entirely by a single organization.
 - b. A **metropolitan area network (MAN)** connects devices across an urban area, for instance, two or more office parks.
 - c. A **wide area network (WAN)** consists of a conglomerate of LANs over widely separated locations. The key aspect here is that it a WAN can be either publicly or privately owned.
3. Networks consist of (a) the **hardware** devices being connected (e.g., laptops, MP3 players) and (b) the **medium** through which the connection is made (e.g., twisted pair, wireless).
4. **Networks can be classified by protocol**, which is a set of standards for message transmission among the devices on the network. **Ethernet** has been the most successful protocol for LAN transmission. Ethernet follows the “polite conversation” method of communicating. The **token ring** protocol originally had a much higher speed than Ethernet. Its early speed advantage has been eclipsed by advances in Ethernet.
 - a. **Switched networks.** Switching takes two basic forms, circuit switching and packet switching.

- b. **Routed networks.** Routers have tables stored in memory that tell them the most efficient path along which each packet should be sent. Routing is what makes the **Internet** possible.
- c. **Wireless networks.** Wi-Fi, Bluetooth, and WiMax are widely used wireless protocols.

D. INTERNET AND INTRANET

1. The **Internet** is a **network of networks** all over the world. The Internet facilitates inexpensive communication and information transfer among computers, with gateways allowing mainframe computers to interface with personal computers.
 - a. **TCP/IP (Transmission Control Protocol/Internet Protocol)** is a suite of communications protocols used to connect computers to the Internet. It is also built into network operating systems.
2. An **intranet** permits sharing of information throughout an organization by applying Internet connectivity standards and Web software (e.g., browsers) to the organization's internal network. An **extranet** consists of the linked intranets of two or more organizations, for example, of a supplier and its customers. It typically uses the public Internet as its transmission medium but requires a password for access.