Al-Mustaqbal University

College of Engineering and Technology

Department of Medical Instrumentation Techniques Engineering

Class: First Class

Subject: Principal Computer

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Lecture Address: Principal Computer

2024 - 2025

Comparison of the Main Types of Data Storage Units

Increased speed and storage capacity

Increased financial cost

Hardware المكونات المادية

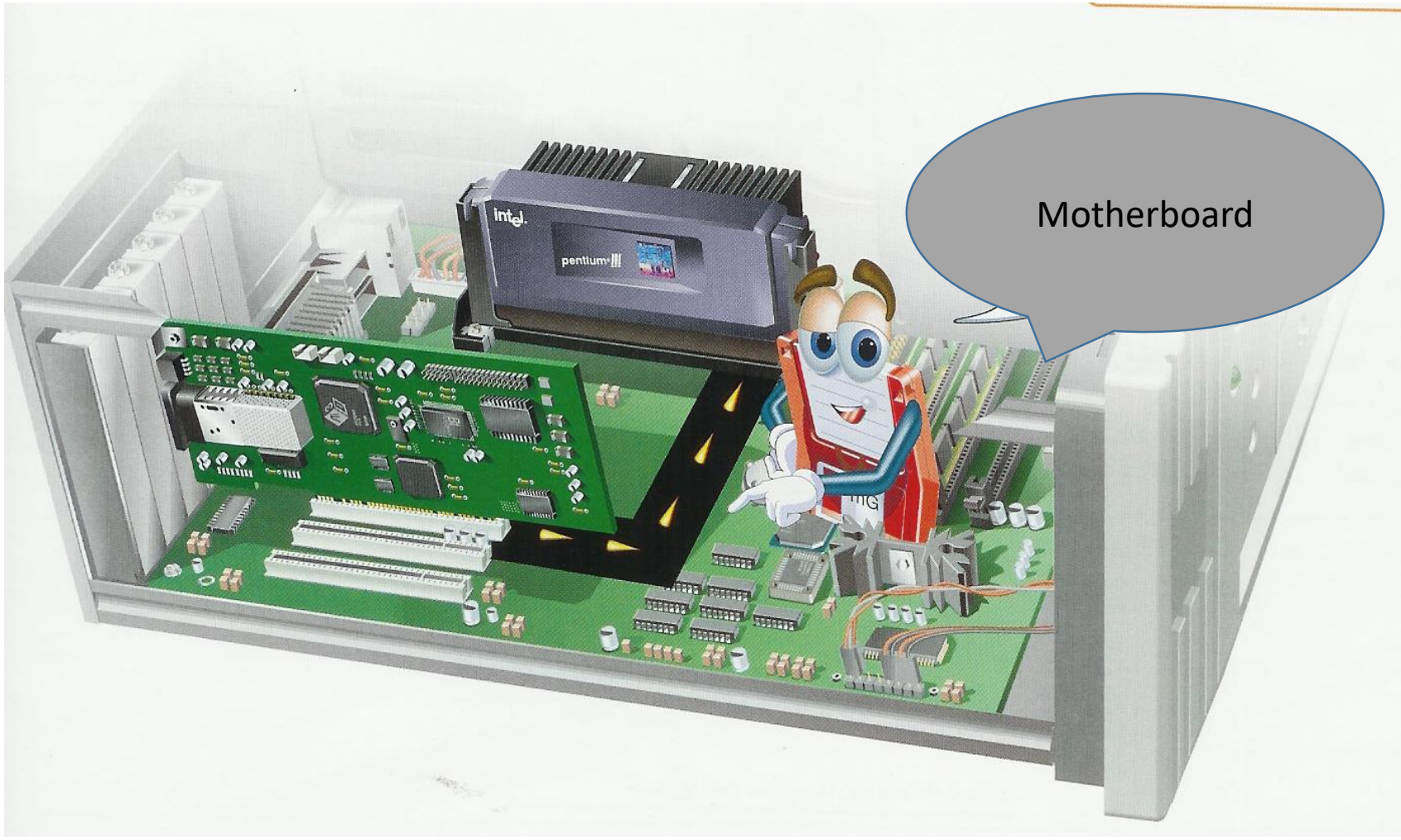
قياس بيانات الحاسب الآلي

The basic unit is the Bit, which is binary-based, i.e., 0 and .1

- Byte = 8 Bits.
- Kilo Byte (KB) = 1024 Byte.
- Mega Byte (MB) = 1024 KB.
- Giga Byte (GB) = 1024 MB.

- Units of Measurement for RAM Capacity
- The unit of CPU speed measurement is Megahertz (MHz)

Computer Case



Computer Case

- **Functions of the Motherboard:**

1- Distributes electrical power.

2- Acts as a bridge for data transfer.

- **Reasons for Naming the Hard and Floppy Disks:**

1- The hard disk is made of rigid material, while the floppy disk is flexible and bendable.

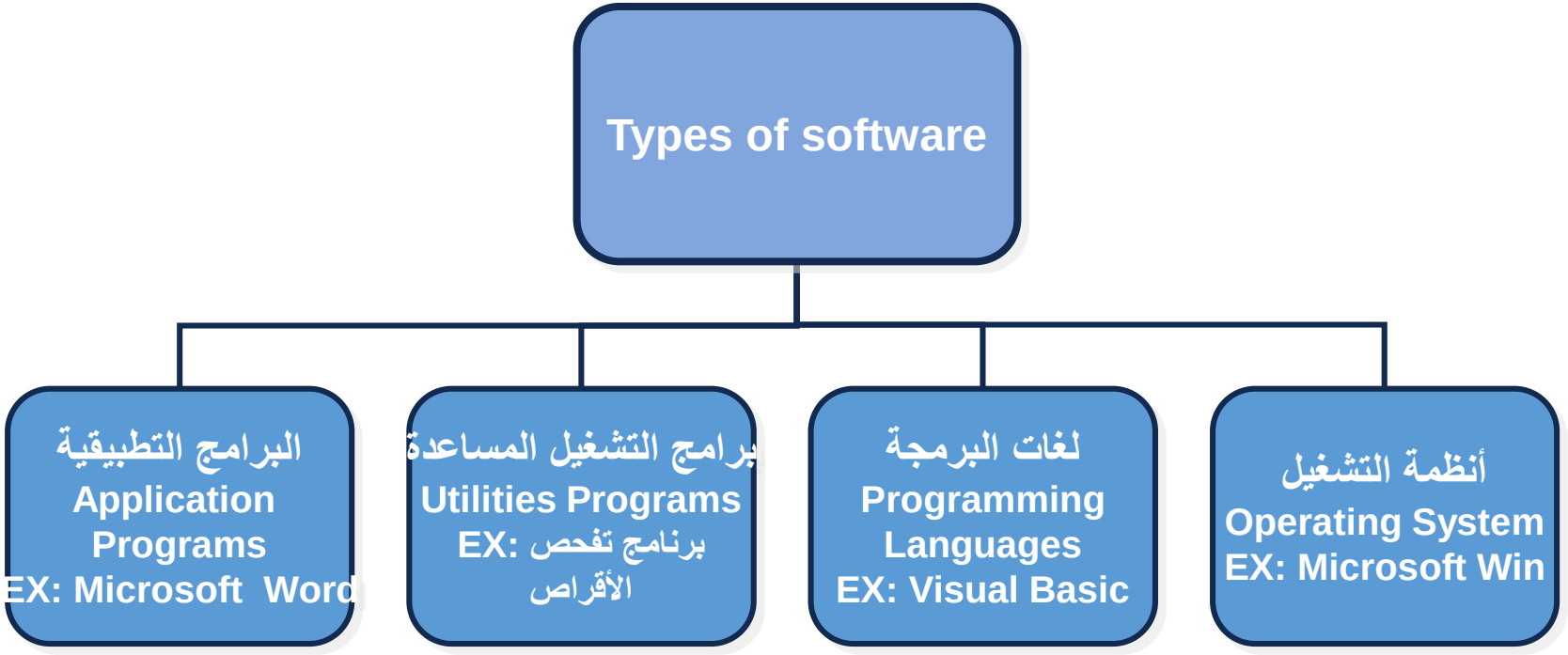
2- The floppy disk is protected by an external plastic cover.

3- They are referred to as "disks" due to their circular shape.

Software Components of the Computer and System Development

المكونات البرمجية Software

- **Software or Programs:** A set of commands and instructions arranged in a specific sequence, executed by the device to achieve a particular purpose.



Operating System نظام التشغيل

- **Operating System**: It is a collection of programs used to run the computer, manage its components, and handle programs and applications.
- **Functions of the Operating System**:

1- Control the data flow.

2- Load programs into memory.

3- Manage the main memory unit.

4- Control input and output devices.

5- Detect malfunctions.

Operating System نظام التشغيل

How the Operating System Works:

1- Reading and executing instructions and commands stored in ROM.

2- Checking the computer units to ensure their integrity.

3- Loading the operating system from floppy disks or optical discs.

4- Receiving commands from the user.

5-Loading and executing application program instructions.

6- Returning to the operating system and waiting for user commands.

Examples of Operating Systems:

- **Disk Operating System (DOS):** It consists of a set of programs and commands, but it does not allow the user to run more than one program at a time and does not support executing multiple commands simultaneously. It requires a certain level of expertise in computing to use it effectively, making it not very user-friendly.
- **Windows Operating System:** It is a graphical user interface (GUI) operating system, meaning users interact with it through a mouse and dropdown menus. It allows for:

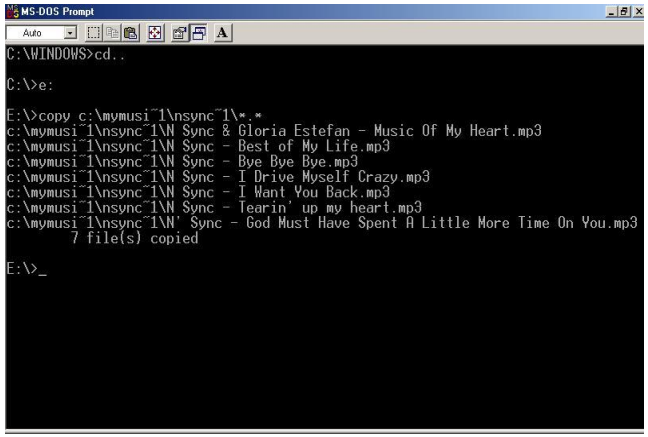
1- Running multiple programs simultaneously.

2- Using languages like Arabic and others as the interface language.

3- Expanding the mouse's functionality beyond selection and execution, to include tasks like setting configurations and copying or deleting files.

4- Running media applications (such as audio and video players).

امثله على انظمة التشغيل



Disk Operating System (DOS)
Windows Operating System
Apple Macintosh Operating System
Unix Operating System

واجهة التطبيق الرسومية GUI

- **Graphical User Interface (GUI):**
  The graphical user interface is an additional part of the operating system that displays windows and dropdown menus, allowing you to interact with the computer using a mouse. Examples of operating systems that use this interface include Windows 95, 98, NT, 2000, and XP.
- **Advantages of Using a Graphical User Interface:**

1- There is a similarity in the way all programs are interacted with.

2- The way to run programs is not highly dependent on the manufacturer.

3- Interaction with application programs follows the same method as with the operating system.

4- It allows programmers to easily write consistent programs.

Application Software

- **Application Software**: It is a type of software that you can use after loading the operating system. Examples of such software include word processing programs, spreadsheets, databases, presentation tools, and multimedia applications.
- Microsoft Word
- Microsoft Excel
- Microsoft Access
- Microsoft PowerPoint
- Flash

Introduction to Computer Networks

Basics of Computer Networks:

- **Network Definition**: A computer network consists of a group of devices connected to each other to share resources.

Benefits of Networking:

1- Information Sharing

2- Device Sharing

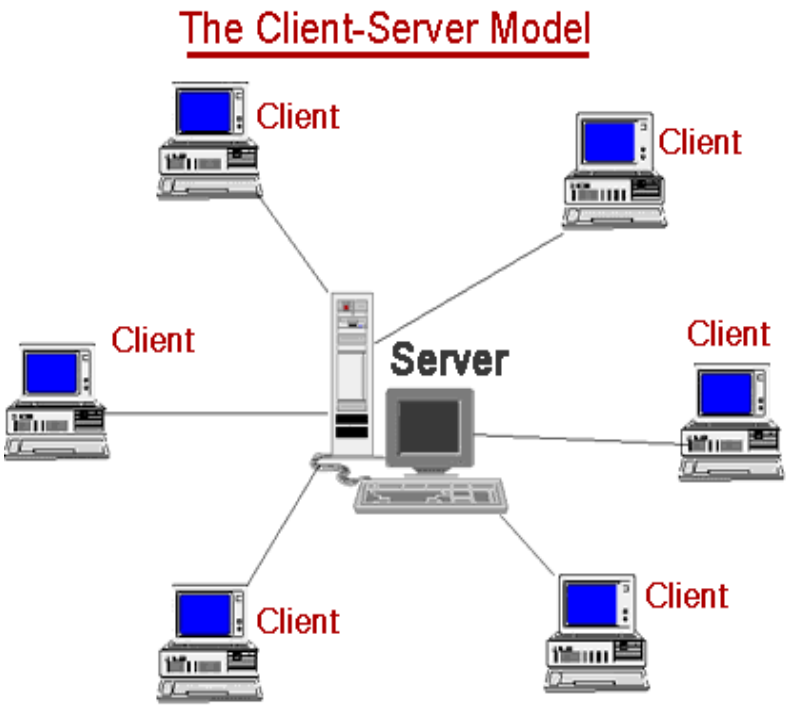
3- Software Sharing

4- Information Security

Network Interaction Axis:

- **Network Terminology Related to Devices:**
- **Server**: High-performance computer systems with large storage and processing capabilities. They provide resources and services to the network and are considered the most important devices in the network.
- **Client**: Personal computers or terminal units that receive resources and services from the server. They do not have control privileges over the network.
- **Network Resources**: These refer to files, printers, and devices used within the network.

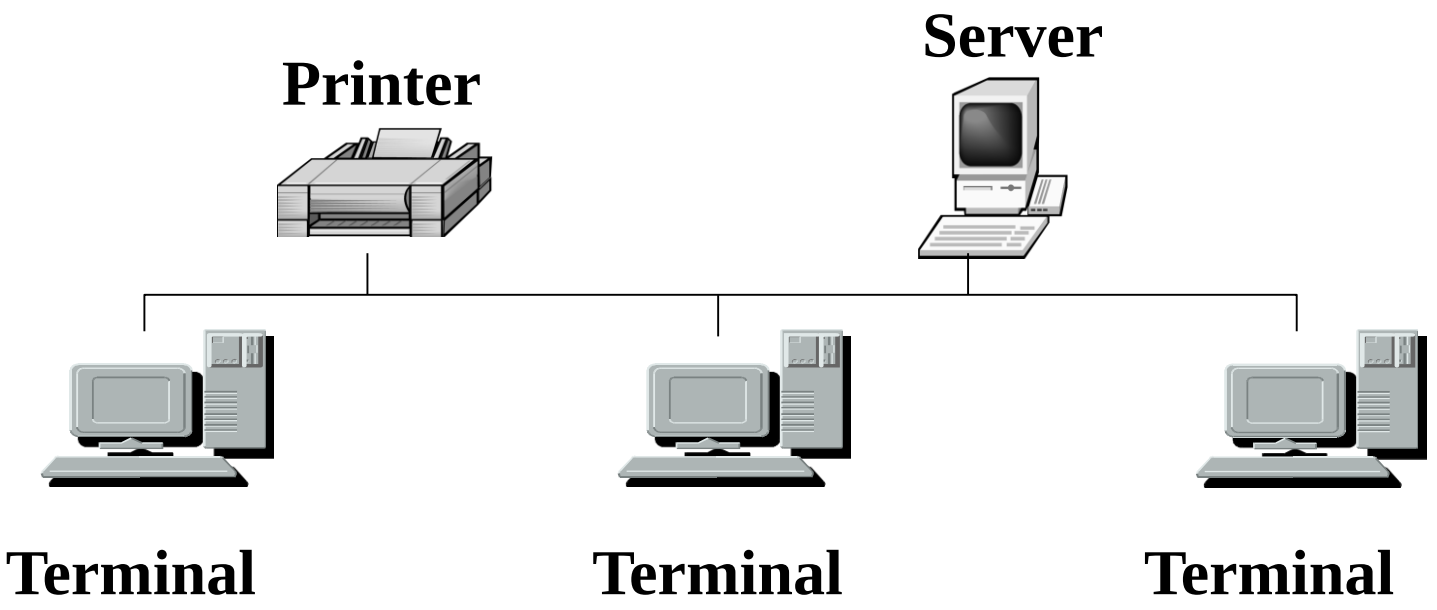
Network Interaction Axis:



Types of Networks Based o Distance:

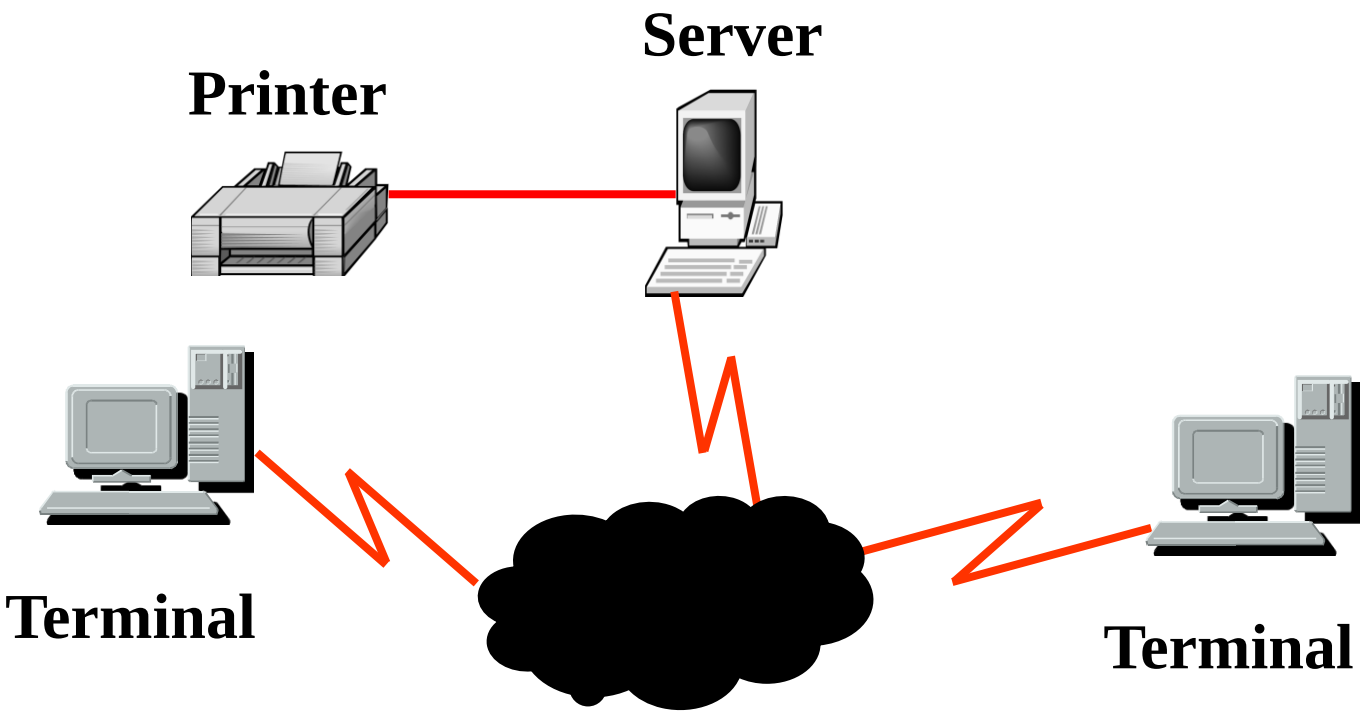
There are two main types of networks.

Local Area Network (LAN)



Types of Networks Based on Distance

- Wide Area Network (WAN)



Internet

- The Internet is a global network that connects various computer networks on a local and global scale, creating an integrated system. It helps users navigate through the complex structure of this global system via telephone lines, satellites, and computers. It is an abbreviation for the phrase "International Network."
- Note: "WWW" is an abbreviation for the term "World Wide Web," and "HTTP" is an abbreviation for the protocol that enables the creation of links between different web pages, which stands for "Hypertext Transfer Protocol.

Internet

Areas of Internet Use:

- Accessing information on any topic you want with great speed.
- The Internet is considered a very good research tool.
- The Internet is a fertile field for marketing and buying and selling operations.

- Benefits and Features of the Internet:
- **E-commerce**: Facilitates online buying and selling.
- **News**: Provides access to up-to-date news from around the world.
- **Email**: Enables quick and efficient communication through electronic mail.
- **Chat**: Allows real-time communication and conversation through various messaging platforms.
- **Software**: Offers access to a wide range of software and applications.
- **Research/Education/Religious Culture**: Provides resources for academic research, online learning, and access to religious and cultural content.

Email

- It is a messaging service similar to regular mail but in an electronic way, which is the reason for its name. Each person has a unique address, and this address is never repeated.
- Sending an email is done instantly.
- Unlike using a phone, there is no need to worry about whether the recipient, who may live on the other side of the world, is available on the other end of the connection. They can read the emails they have received and respond at any time.

Email

- Uses of email: Sending emails to an individual or a group of people, reading emails and replying to them, deleting and storing email messages, forwarding emails to different destinations, sending attachments with emails, etc.
- Requirements for sending and receiving email: To send and receive emails, you will need a computer, along with some computer components, software, and an internet connection.

Viruses

Viruses

- **Definition of a Virus:** A virus is a program designed with the intent to damage a computer system. It has the ability to attach itself to other programs and replicate itself.
- **Reasons for the Spread of Viruses:**
- Lack of proper security measures
- Downloading files or programs from untrusted sources
- Opening infected email attachments
- Using outdated or unpatched software
- Sharing infected files via external storage devices
- **Types of Viruses:**
- **Trojan Horse**: A malicious program that disguises itself as a legitimate file or program.
- **Logic Bombs**: A virus that is activated based on a specific condition or trigger.
- **Time Bombs**: A virus that is set to activate at a specific time or date.
- **Trapdoor**: A backdoor that allows unauthorized access to a system without being detected.
- **Worms**: A type of virus that spreads independently by exploiting vulnerabilities in a network.

Viruses

- **Some Protection Methods:**
- Antivirus programs such as: (McAfee, Antivirus, Adware, Spyware)
- Creating backups.
- Firewall.
- Password.
- User awareness about not downloading any programs from untrusted sources onto their personal computers, and being cautious when dealing with free software, especially those distributed by computer stores.
- Scanning emails before opening them.