The Role of Operating Systems

SEMtech!
Student Engagement & Mentoring in Technology

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Understanding the Functionality and Importance of Operating Systems

Introduction to Operating Systems

- The operating system (OS) serves as an interface between the user and hardware. It allows applications to run and manage hardware resources like memory, CPU, and storage. Popular operating systems include Microsoft Windows, macOS, and Linux.
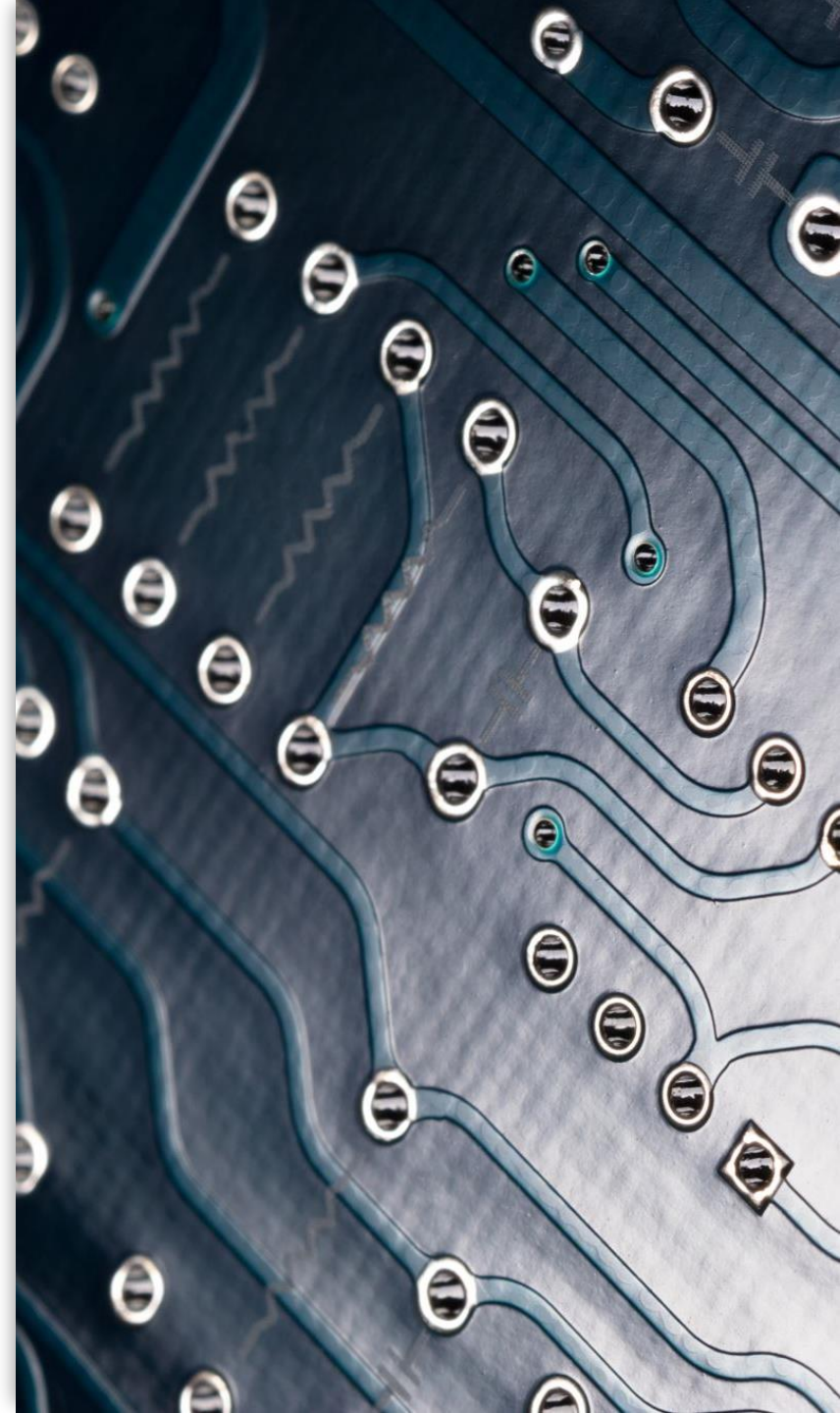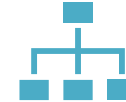
Objectives of an Operating System

- Interface between applications and hardware

- Disk management

- Process management and Scheduling

- Application management

- Memory management

- Device management

- Access control and protection

- Types of Operating Systems

Disk Management

- The OS organizes storage through disk management. Hard drives are large devices storing data in locations across the disk, and the OS arranges it for easy access through folder structures. It also retrieves data when required.

Memory Management

- Memory is a storage area, and the OS manages its contents, ensuring that applications only access memory allocated to them. This is important for security, preventing applications from accessing each other's memory.

Process Management & Scheduling

- The OS manages all running processes, ensuring each gets access to the CPU as needed. It also schedules tasks, allowing administrators to configure actions to run at specific times. This helps in multitasking and performing repetitive tasks.

Application Management

- When applications crash, the OS provides tools to manage and terminate processes manually. This allows IT professionals and users to manage faulty applications and restore normal operation.
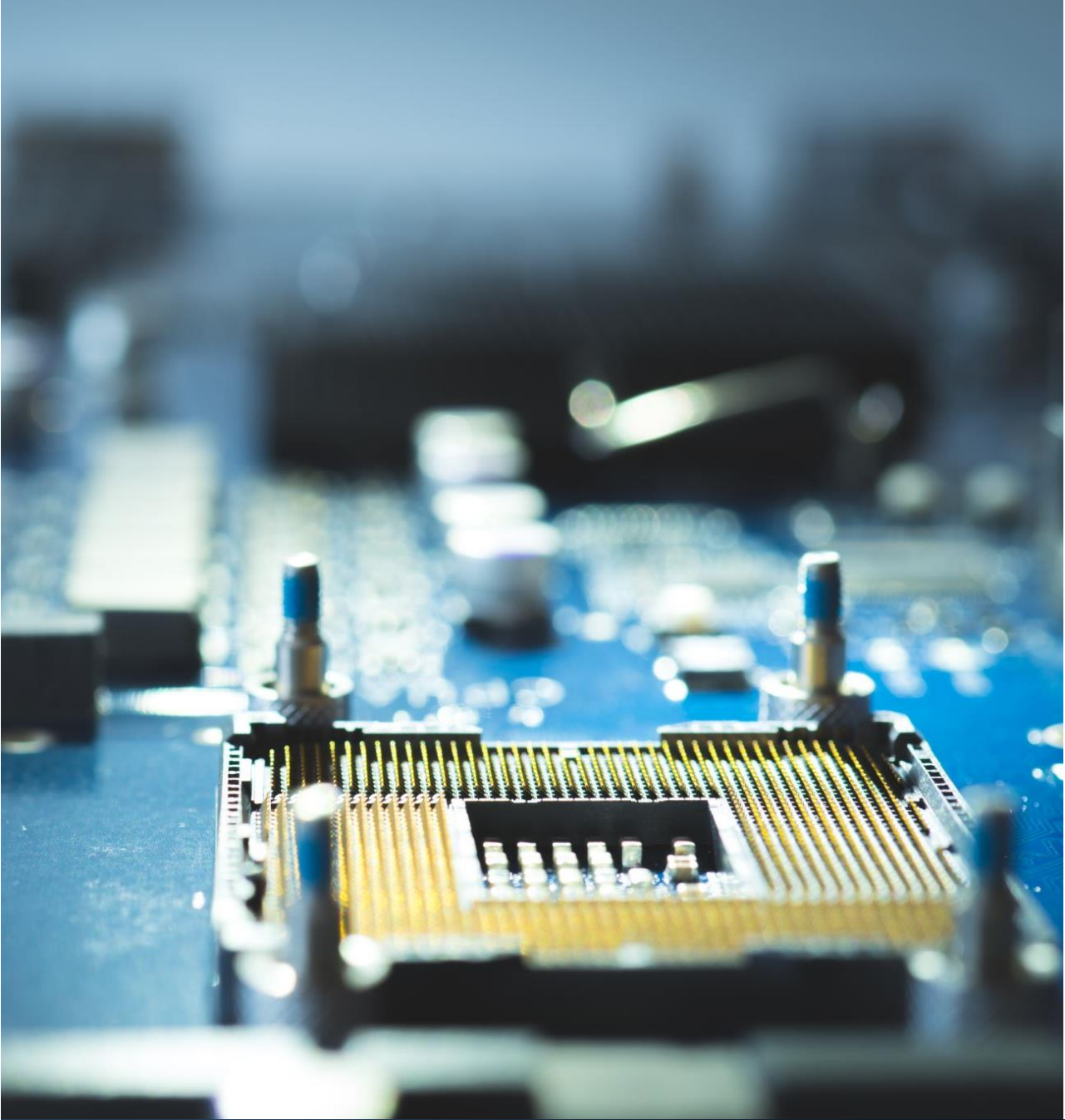
Device Management

- The OS manages drivers, which facilitate communication between the computer and its peripheral devices, such as printers, keyboards, and storage devices. It ensures the smooth exchange of data between devices and the computer.

Types of Operating Systems

There are several types of operating systems based on their usage and functions:

- Desktop Operating Systems (Windows, macOS, Linux)

- Mobile Operating Systems (iOS, Android)

- Server Operating Systems (Windows Server, Linux distributions)

- Embedded Operating Systems (Used in IoT devices)

Access Control & Protection

- The OS is responsible for ensuring the security of the system through access control. It regulates which users and applications can access certain resources, protecting the integrity and security of the system.
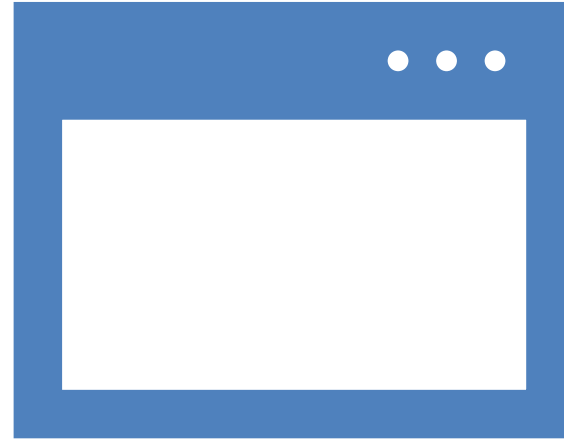
Questions?

The End

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