

College: J D Women's College	Subject: Operating System
Dept: BCA	Unit/Topic: I/O Management
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Notes on Lecture - 1

Operating System – I/O Management

Introduction

One of the important jobs of an Operating System is to manage the operations of various I/O devices including mouse, keyboards, touch pad, disk drives, display adapters, USB devices, Bit-mapped screen, LED, Analog-to-digital converter, On/off switch, network connections, audio I/O, printers etc.

The I/O system of an OS works by taking I/O request from an application software and sending it to the physical device, which could be an input or output device then it takes whatever response comes back from the device and sends it to the application.

Components of I/O Hardware

- I/O Device
- Device Driver
- Device Controller

I/O Device: I/O devices such as storage, communications, user-interface, and others communicate with the computer via signals sent over wires or through the air. Devices connect with the computer via **ports**, e.g. a serial or parallel port. A common set of wires connecting multiple devices is termed a **bus**.

I/O devices can be divided into two categories –

- **Block devices** – A block device is one with which the device driver communicates by sending entire blocks of data. For example, Hard disks, USB cameras, Disk-On-Key etc.
- **Character devices** – A character device is one with which the device driver communicates by sending and receiving single characters (bytes, octets). For example, serial ports, parallel ports, sound cards etc

Device Driver: Device drivers are software modules that can be plugged into an OS to handle a particular device. Operating System takes help from device drivers to handle all I/O devices.

Device Controller: The Device Controller works like an interface between a device and a device driver. I/O units (Keyboard, mouse, printer, etc.) typically consist of a mechanical component and an electronic component where electronic component is called the device controller.

There is always a device controller and a device driver for each device to communicate with the Operating Systems. A device controller may be able to handle multiple devices. As an interface its main task is to convert serial bit stream to block of bytes, perform error correction as necessary.

Any device connected to the computer is connected by a plug and socket, and the socket is connected to a device controller. Following is a model for connecting the CPU, memory, controllers, and I/O devices where CPU and device controllers all use a common bus for communication.

