

Computer Tips

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Knowing Your Operating System-3

The path between the operating system and virtually all hardware not on the computer's motherboard goes through a special program called a driver. Much of a driver's function is to be the translator between the electrical signals of the hardware and the programming languages of the operating system and application programs. Drivers take data that the operating system has defined as a file and translate them into streams of bits placed in specific locations on storage devices, or a series of laser pulses to a printer.

Because there are such wide differences in hardware, there are differences in the way that the driver programs function. Most run when the device is required, and function much the same as any other process. The operating system will frequently assign high-priority blocks to drivers so that the hardware resource can be released and readied for further use as quickly as possible.

One reason that drivers are separate from the operating system is so that new functions can be added to the driver without requiring the operating system itself to be modified and redistributed. These driver enhances are distributed and applied by 'updating' the particular hardware driver. Thus the user is able to greatly enhance the capability of the overall system.

Managing input and output between hardware and the CPU is largely a matter of managing queues and buffers, special storage facilities that take a stream of information from a device, perhaps a keyboard or a serial port, hold those bits, and release them to the CPU at a rate with which the CPU can cope. This function is especially important when a number of processes are running and taking up processor time. The operating system will instruct a buffer to continue taking input from the device, but to stop sending data to the CPU while the process using the input is suspended. Then, when the process requiring input is made active once again, the operating system will command the buffer to send data. This process allows a keyboard or a modem to deal with external users or computers at a high speed even though there are times when the CPU can't use input from those sources.

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