Cycle Stealing Encyclopedia Article

Cycle Stealing

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Cycle Stealing

Cycle stealing is a **design** technique for the **central processing unit** (**CPU**) that periodically "grabs" machine cycles from the main processor usually by some peripheral control unit, such as a DMA (direct **memory access**) device. (A *cycle* of a computer is the speed of oscillations of the computer's internal clock. The cycle is usually measured in megahertz (MHz), or millions of cycles per second. Also called clock speed, the cycle determines how quickly the CPU can execute basic instructions and is used to synchronize the activities of various components (or "peripherals") in a computer system.) When cycle stealing occurs the DMA **channel** is given priority to memory over the CPU. In this way, processing and peripheral operations can be performed concurrently or, at least, with some degree of overlap.

Computers are often idle even when a user is working on the computer. Studies have shown that computers can be in an idle state for up to fifty percent of the time. Even while the computer is in direct use by the user (e.g., physically pressing keys of the computer or clicking on the **mouse**), substantial resources are still available to run other jobs. The technique of cycle stealing allows the processor that is waiting for a primary job, such as information from users, input/output devices, or networks, to take (or "steal") unused cycles for secondary jobs (those other than the primary job). Since the CPU has ultimate priority over these secondary jobs, the stealing of cycles normally does not adversely affect the performance of the computer with respect to the processing of the primary job.