Performance Factors

Wednesday, 2 November 2022 8:05 PM

Difference b/w a microprocessor and a core:

For a single core processor, it has control unit (CU), Arithmetic & Logic Unit (ALU) & Memory Unit (MU).

For a multicore processor a processor contains multiple cores, it has a shared memory and every core in it just has CU and ALU. All the cores share same memory

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How the no. of cores effect the performace of the computer?

Multiple cores can share a single program instructions and execute them simultaneously. Every program can not be shared but programs written with the intent to be executed with multiple cores, like games, perform better with multiple cores.

For example:

Task:

Add nos from 1 to 100.

$1+2+3+4+5+\cdots\cdots\cdots+100$

A single processor require 100 instruction cycles to complete ~~this~~ task.

Lets distribute this additions task among 4 cores.

Core 1: Adding 1 TO 25
Core 2: Adding 26 TO 50
Core 3: Adding 51 TO 75
Core 4: Adding 76 TO 100

All four cores together will take 25 instructions cycles to complete the task.

Role of cache in computer's performance:

Cache is temporary memory inside the microprocessor. Time for an instruction to arrive in processor is much higher than the time processor takes to execute that instruction. So instead of bringing in a single instruction, processor brings a bunch of instructions and saves them in cache memory. While the instructions are being executed computer keeps filling the cache for the smooth execution of programs' instructions. This way computer never waits for instructions arrival once the program is executing.
It enhances the overall computer performance.

System's clock and computers performance:

System's clock inside the processor is responsible for the speed of execution of instructions by the processor. So faster clock means faster execution of instructions. System's clock is attached to control unit to push it every time it ticks for the next fetch-decode-execute cycle.