

Re: Why do CPUs run hotter...?

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In article <1150667780.533129.170350@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>, irwin@xxxxxx says...

mc wrote:

Why does a Pentium CPU run hotter when "working hard" (executing complex software) than when the OS is idling?

It is always executing **some** instruction, and in that sense, is never idle.

I understand that CMOS gates dissipate power only when changing state. I **presume** what's going on is that when the CPU is executing software, it is executing a greater variety of machine instructions and therefore heating up a larger proportion of the circuitry in the chip (since there is special circuitry for each kind of instruction).

Am I on the right track? This is one of those dumb questions where I'd like to know the exact answer, rather than just guessing.

- 1) Yes you are on the right track as idling will only involve regurgitating a few instructions in the cache and will require less use of CPU cct's.

Nonsense. If nothing is happening reasonably current processors do **NOTHING**. The clock tree accounts for something on the order of 40% of the power and leakage as much of the rest. If the processor is doing nothing, shut off the clocks and lower the voltage.

- 2) The OS can throttle back the CPU when it is lightly loaded (mostly used on portables)

It's called **HALT**, and has been done for at least a decade.

Re: Why do CPUs run hotter...?

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Keith

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