

If you like pointless exercises . . .

You'll love the Commerce Department's proposed 'super' definition

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The U.S. Department of Commerce's Bureau of Export Administration might want to rename itself either the Bureau of Export Assistance or the Bureau of Export Aggravation, just to let everyone know where it stands.

In November 1990, the bureau was asked by President Bush "to initiate international negotiations by Jan. 1, 1991, to establish a new supercomputer supplier regime." For some reason, the bureau has taken this request as a mandate to attempt a brand-new definition of "supercomputer," which potentially includes many more computers, such as workstations.

What the bureau is worried about is getting a new, single-value metric to measure supercomputer performance.

The current metric, processor data rate (PDR), is actually OK, if one is fixed on getting just *one* number that signifies the ability to do 64-bit arithmetic computation. A footnote is need-

ed, however, that says that a machine actually has to be capable of delivering the PDR on a test program that the formula gives. On the other hand, the proposed new metric, composite theoretical performance (CTP), is a bureaucrat's delight and was probably cooked up by a former high-level Internal Revenue Service form and instruction designer who wanted to harass the computer industry.

In no instance could a machine ever deliver the measure that CTP implies, because it has no physical significance and concerns itself with theoretical or "thing" operations per second, a "thing" being an architecture constructed of computing elements designed by unidentified bureaucrats.

I won't go into the proposed CTP, except to say that logical, integer and floating-point operations per second (FLOPS) rates, word length and some random constants and I/O data rates all contribute a theoretical or "thing" operation to CTP. Since CTP bears no relationship to a

computer or its performance on any program or work load, a real computer is rated pessimistically or optimistically at random.



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At least the old metric, PDR, almost equated to the manufacturers' peak or advertised speed. It also had the advantage of being able to be verified experimentally.

Adopting the CTP metric

might assure full employment in Washington, D.C., but it would inevitably decrease trade competitiveness and industry productivity (unless we start measuring productivity by the fractional CTPs that a company can calculate and government servants can check each year). More time will be lost at even more firms that should be working on computers.

The bureau is concerned about computers in the 200 to 1,500 millions of "thing" operations per second (MTOPS) range, which is near that of powerful workstations and microprocessors. Further, using its method of computing, a "composite theoretical thing" that performs logical operations rapidly on 16-bit data can have the same power as a computer that does 64-bit floating-point arithmetic. What this means is that the bureau can draw more firms into its web.

This brings up yet another problem with trying to inhibit the export of traditional supercomputers — the harder we try, the more our economic and military competitors are encouraged to build their own supercomputers or supercomputer substitutes. This is easier for

them to do now, since it is becoming increasingly true that "FLOPS is FLOPS" no matter if you buy them as a supercomputer with a few GFLOPS or as boxes of 50 to 100 MFLOPS parts, which fall below the CTP control line.

A new single-value metric just doesn't feel right to characterize all the situations one could envision a bureaucrat might want to control.

What would I do?

Computer and chip manufacturers know performance metrics such as Linpacks, Livermore's Kernels and Specmarks. The bureau should use one or two of these as control thresholds, depending on what it is trying to control (e.g., weapons calculation, real time control, decryption). I would also ask the suppliers to propose a time-varying metric, given some stated objectives from the government of what it is trying to control.

These actions would free industry to build and sell competitive machines. The process might also teach the Commerce Department and the industry to work together, while a U.S. supercomputing industry still exists.

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