Huppenthal

Reference 10

A PRACTITIONER'S GUIDE TO ADJUSTED PEAK PERFORMANCE

U.S. Department of Commerce
Bureau of Industry and Security

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The ISTAC is a government sponsored technical advisory committee made up of industry and government representatives and administered by the Department of Commerce. The ISTAC advises the U.S. Government on U.S. export control matters as authorized under the Export Administration Act.

Note

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US Dept. of Commerce, BIS, Information Systems Technical Advisory Committee

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BACKGROUND

On April 24, 2006 the US Department of Commerce implemented a new formula for calculating the performance of digital computers, replacing the Composite Theoretical Performance (CTP) formula, measured in Millions of Theoretical Operations per Second (MTOPS), with the Adjusted Peak Performance (APP) formula, measured in Weighted Teraflops (WT).

The APP formula, like the CTP formula it replaced, was designed to determine computer performance for export control purposes. The CTP formula implemented in 1990 could no longer keep up with advances in microprocessor technology and computer architecture, and was therefore losing relevance in meeting national security objectives. The APP formula, derived from existing industry standards, is a more accurate differentiator between high-end, special-order, high-performance computers (HPCs) such as vector supercomputers, and commodity off-the-shelf systems.

The APP formula restored the credibility for controlling HPCs by focusing controls on the high end of industry capability systems. The applications run on these systems demand exceptional floating-point performance. HPCs used for national security applications include vector supercomputers, massively-parallel processor systems, and proprietary cluster architectures.

This practitioner's guide is written as an aid to calculating the WT values of HPCs. A similar guide, *A Practitioner's Guide to Composite Theoretical Performance*, was published in November 1991 to accompany the implementation of the CTP formula. Like its predecessor, this practitioner's guide recognizes that a rating system for export control of computers must be: easy to complete, independent of software, subject to governmental audit, and capable of producing a single rating number for a given computer.

APP is simple, can usually be calculated with publicly available vendor literature, does not require actual benchmarks, and provides a reasonable degree of accuracy in ranking HPCs. Like CTP, it produces a peak number which can be thought of as a "not to exceed" value, independent of memory and I/O considerations. The only thing that matters is the computer's ability to produce 64-bit or larger floating-point arithmetic results per unit time. While the formula is new, many of the notes are either unchanged or adapted from CTP to APP. This allows exporters to follow familiar rules in determining APP values and classifying computers. APP

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