

Accelerator Use Surges in World's Top Supercomputers

More Than 100 Accelerated Systems Now on TOP500 List

SC15 - Today's list of the world's TOP500 supercomputers shows the extent to which accelerated systems are shaping the future of the industry.

TOP500 Highlights

- One-third of FLOPS now powered by accelerators
- NVIDIA Tesla GPUs sweep 23 of 24 new accelerated supercomputers
- Tesla supercomputers growing at 48% CAGR over past five years

For the first time, more than 100 accelerated systems are on the list of the world's 500 most powerful supercomputers, accounting for 143 petaflops, over one-third of the list's total FLOPS. NVIDIA® Tesla® GPU-based supercomputers comprise 70 of these systems -- including 23 of the 24 new systems on the list -- reflecting compound annual growth of nearly 50 percent over the past five years.

There are three primary reasons accelerators are becoming increasingly adopted for high performance computing.

First, Moore's Law continues to slow, forcing the industry to find new ways to deliver computational power more efficiently. Second, hundreds of applications -- including the vast majority of those most commonly used -- are now GPU accelerated. Third, even modest investments in accelerators can now result in significant increases in throughput, maximizing efficiency for supercomputing sites and hyperscale datacenters.

"One day, all supercomputers will be accelerated," said Jen-Hsun Huang, co-founder and chief executive officer at NVIDIA. "Leading supercomputing sites around the world have turned to GPU-accelerated computing, reflected in today's TOP500 list. As the pace of discovery accelerates and researchers turn to computation, machine learning and visualization, we fully expect to see this trend increase."

Many of the world's leading systems use NVIDIA Tesla accelerators, including the fastest supercomputers in 10 countries. These include: the fastest system in the U.S., Titan, at Oak Ridge National Laboratory; the fastest system in Russia, Lomonosov 2, at Moscow State University; and the fastest system in Europe, Switzerland's Piz Daint, at the Swiss National Computing Center.

Moore's Law Slows

As the size of transistors approaches atomic scale, it has become increasingly difficult to improve microchip performance without disproportionately increasing power or cost. While the industry can no longer rely on performance doubling every 18 months, computational demands continue to increase sharply. This has led to the growing adoption of accelerators, which work alongside CPUs to boost the performance of scientific and technical applications.

Hundreds of HPC Applications Support GPU Accelerators

The Tesla Platform has grown steadily since 2008 in the number of supported scientific, engineering, data analytics and other applications, with [370 GPU-accelerated applications](#) now available.

A new study by Intersect360 Research, a tech research firm, shows that nearly 70 percent of the 50 most widely used HPC applications -- and 90 percent of the top 10 -- support GPU accelerated computing. Among them are the ANSYS Fluent computational fluid dynamics application; the GROMACS molecular dynamics application; and now -- as announced separately today -- VASP, an atomistic simulation application used by researchers around the world to model the behavior of individual atoms at the electronic level.

One of the study's authors, Addison Snell, CEO of Intersect360 Research, said: "Accelerated computing has reached the tipping point in HPC, with NVIDIA's Tesla GPUs as the leader in the market. The adoption of accelerators and availability of GPU-accelerated versions of top HPC codes have been steadily increasing."

Improved Datacenter Throughput with GPUs

Supercomputing and hyperscale datacenters can cost hundreds of millions of dollars. In the past, the steady progression of Moore's Law allowed them to upgrade with new CPUs to keep up with ever-increasing demand. That's no longer possible. With the advent of GPU-accelerated computing, these large datacenter investments can be extended with the addition of NVIDIA Tesla accelerators which boost throughput required to meet these demands.

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Certain statements in this press release including, but not limited to, statements as to: the effect of accelerated systems, Moore's Law and investments in accelerators; all supercomputers being accelerated one day; the increasing trend of GPU-accelerated computing; computational demands continuing to increase; and the adoption of accelerators and availability of GPU-accelerated HPC codes increasing are forward-looking statements that are subject to risks and uncertainties that could cause results to be materially different than expectations. Important factors that could cause actual results to differ materially include: global economic conditions; our reliance on third parties to manufacture, assemble, package and test our products; the impact of technological development and competition; development of new products and technologies or enhancements to our existing product and technologies; market acceptance of our products or our partners' products; design, manufacturing or software defects; changes in consumer preferences or demands; changes in industry standards and interfaces; unexpected loss of performance of our products or technologies when integrated into systems; as well as other factors detailed from time to time in the reports NVIDIA files with the Securities and Exchange Commission, or SEC, including its Form 10-Q for the fiscal period ended July 26, 2015. Copies of reports filed with the SEC are posted on the company's website and are available from NVIDIA without charge. These forward-looking statements are not guarantees of future performance and speak only as of the date hereof, and, except as required by law, NVIDIA disclaims any obligation to update these forward-looking statements to reflect future events or circumstances.

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