



Ansys Accelerates CFD Simulation by 110x with NVIDIA GH200 Grace Hopper Superchips

November 18, 2024

Ansys Fluent coupled with NVIDIA accelerated computing significantly speeds large-scale CFD simulations, reducing run time from four weeks to six hours

/ Key Highlights

- [Ansys Fluent®](#) fluid simulation software solved a 2.4-billion-cell-problem using 320 NVIDIA GH200 Grace Hopper Superchips scaled with NVIDIA Quantum-2 InfiniBand at the Texas Advanced Computing Center (TACC)
- Combining NVIDIA Grace Hopper Superchips and Ansys software enables significantly faster, higher fidelity simulation, improving R&D processes for more innovative products

PITTSBURGH, Nov. 18, 2024 /PRNewswire/ -- In a significant milestone, [Ansys](#) (NASDAQ: ANSS) today announced results of the largest Fluent CFD simulation ever run on [NVIDIA GH200 Grace Hopper Superchips](#). The technology collaboration accelerated simulation by 110x, reducing the overall run time from four weeks to six hours. The accomplishment reflects Ansys' commitment to pushing the boundaries of innovation and amplifying complex simulation in applications across industries, including automotive and aerospace external aerodynamics, gas turbine combustion, chemical mixing processes, and semiconductor manufacturing.



Large-scale CFD simulations are complex and time-consuming due to the multiphysics interactions, intricate geometries, and the need for high-resolution results to match real-world data. These simulations can take days or weeks to run on CPU cores. Additionally, refining the model extends run time and often requires purchasing additional computational power. By harnessing the power of GPUs, Ansys solutions can deliver pervasive insights in a fraction of the time and maintain high predictive accuracy on even the biggest models using fewer computational resources.

Using advanced computing capability at TACC, Ansys collaborated with NVIDIA to run a 2.4-billion-cell automotive external aerodynamics simulation, enabling two separate yet critical outcomes. First, Ansys software solved the CFD simulation significantly faster while maintaining the same predictive accuracy. Second, designers can add more parameters to refine the accuracy without having to compromise on overall simulation speed.

Specifically, 320 GH200 Grace Hopper Superchips, with multi-node scaling through [NVIDIA Quantum-2 InfiniBand](#), provided a 110x speed-up over using 2,048 CPU cores, achieving the same performance equivalent to approximately 225,390 CPU cores. In addition, for customers using a typical deployment of GPUs, benchmark data showed that when scaling to 32 GPUs, one NVIDIA GH200 Grace Hopper Superchip delivers the same performance as nearly 1,408 CPU cores.

"Ansys is committed to delivering increased performance and capability to provide our customers with higher levels of simulation fidelity and engineering insight to accelerate innovation," said Shane Emswiler, senior vice president of products at Ansys. "Upgrading to the latest GPU technology can enable our customers to save hours of engineering and product development time, where time to market is essential. Moreover, the energy consumption is much lower across the development cycle, which saves our customers significant costs and resources."

Ansys is also the first to adopt an Omniverse Blueprint, a reference workflow of NVIDIA acceleration libraries, artificial intelligence frameworks, and Omniverse technologies that enables real-time, interactive physics visualization in Ansys applications.

"The power of NVIDIA GH200 Grace Hopper Superchips enables customers to push the limits of simulation model sizes and complexity," said Tim Costa, senior director of CAE, EDA and quantum at NVIDIA. "The combination of NVIDIA accelerated computing and Ansys software provides engineers with powerful simulation tools to tackle complex engineering problems and reduce time-to-market across industries such as automotive, aerospace, manufacturing and more."

[Visit Ansys at Supercomputing24](#) in Atlanta, GA, November 17-22, 2024, at booth #2741 to learn more.

/ About Ansys

Our Mission: Powering Innovation that Drives Human Advancement™

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

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