

Cray® XC40™ Supercomputer Efficiently Scales CFD++ to Over 8,000 Cores on 200 Million-Cell Solid Rocket Booster Test

Partner

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About Metacomp Technologies

Metacomp Technologies is at the cutting edge of technology in computational fluid dynamics (CFD), computational aero-acoustics, mesh generation and electrostatic paint deposition. Founded in 1994, activities at Metacomp include research, software development, dissemination and support, consulting, education and application services.

Application

CFD++ V15.1

Cray® XC40™ Test System Specs

- Dual-socket node with 128 GB memory per node
- 16-core, 2.3 GHz Intel® Xeon® E5 series processors
- Aries interconnect

Cray® XC™ Series Supercomputer

The Cray XC series supercomputer is a groundbreaking architecture upgradable to 100 petaflops and delivering sustained, scalable application performance and investment protection with easy upgradability.

About Cray

Cray provides advanced systems for the most difficult computing, storage and data analytics challenges. The company's portfolio includes cluster systems, supercomputers, storage solutions, and data analytics and discovery platforms. Founded in 1972, Cray has been developing, building and supporting supercomputing technologies for over 40 years.

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Most computer-aided engineering (CAE) environments today rely on commercial ISV applications. It means users need computing solutions that provide not only excellent performance but active support for these codes.

Cray provides performance and support as well as the assurance that comes from more than 30 years spent supporting CFD applications, our direct relationships with ISVs such as Metacomp Technologies, robust user communities, and intimate knowledge of key CAE codes.

A recent test of Metacomp Technologies' CFD++ application on the Cray® XC40™ supercomputer provides proof.

Using benchmark data representing the external aerodynamics of a solid rocket booster with high-speed flow and zero angle of attack, Cray ran a 200 million-cell mesh test case up to 8,000+ cores.

The results showed that on the Cray XC40 system, CFD++ scales efficiently, achieving a nearly 2,500 times speed up in performance. (See Fig. 1)

In particular, the test shows that Cray CAE solutions can deliver reliable, sustained performance on large CFD workloads. Cray systems incorporate hardware and software designed for scalability, minimizing the scaling obstacles associated with parallel applications and enabling users to employ not just hundreds, but *thousands* of compute cores.

Cray has worked with the CFD community for decades. In fact, many members of our applications team each have over 25 years of experience with applications support. This scope of experience combined with the broad range of hardware and software technologies Cray supports means you get proven, results-driven CAE solutions.



Figure 1. 200 Million-Cell Benchmark Using Solid Rocket Booster Data

