

Press Release

SGI Altix ICE 'In a League of Its Own' Delivering High Performance Compute to Support Honda's Formula One Racing Team

SGI solution includes 18 percent faster benchmark performance, class-leading energy-efficiency and "unique awareness" of the Honda Racing F1 Team's requirements SUNNYVALE, Calif. and Reading, UK (March 3, 2008)—To date, Honda has secured 72 Grand Prix victories and 11 FIA Formula One World Championship titles — including six constructors' and five drivers' crowns. The Honda Racing F1 Team, based in Brackley, UK, installed in September a high performance SGI® Altix® ICE integrated blade platform, which it expects to make a significant impact on the contribution provided by computational fluid dynamics (CFD) during the 2008 Formula One season.

CFD improvements drive faster lap times

"Formula One is a fiercely competitive business where fractions of a second could gain you ten places on the grid, and where the overall rate at which you can develop your car means the difference between winning and ending up outside the points," explains Henrik Diamant, Head of CFD, Honda Racing F1 Team. "The drive for performance is relentless, and with the current technical regulations, aerodynamics is the key area where crucial lap time gains can be made.

"Traditionally, aerodynamic development has been conducted in wind tunnels, but with recent advancements in CFD codes and supercomputers, an increasing number of race car parts are developed directly in CFD, saving both time and costs. Although we've been running large, complex, complete car CFD models at the Honda Racing F1 Team for a number of years, it's only recently that software developments have truly revolutionized the process. For example, five years ago, generating a CFD model of the complete car would have required weeks, whereas with today's largely automated tools our engineers can create a model in a few hours. Needless to say, with such an increased throughput, the limitations on the number of models or parts we can analyze depend on the hardware used to solve these very complex calculations."

To assist with the aerodynamic development of its cars, the Honda Racing F1 Team's CFD department used a number of home-grown 'white-box' clusters until recently. "With our existing installation we were able to analyze a couple of dozen different geometries per week," continues Diamant. "We had recently speeded up our CFD process to such an extent that our biggest bottleneck was the hardware, which is where SGI and the SGI Altix ICE come in."

18 Percent Faster Benchmark Performance

Given a budget by Honda to increase the speed of its development process, the CFD department undertook an extensive survey of the available technology to identify the optimum solution. "It quickly became clear to us that for the same number of processors, the performance of the SGI Altix ICE system was in a league of its own," says Diamant. "In fact, we were absolutely amazed when we benchmarked two systems of what would appear to be an identical specification and noted that our CFD calculations ran 18 percent faster on the SGI Altix ICE. For us, that means places gained on the grid!"

Altix ICE is the SGI next-generation integrated blade platform based on Dual-Core and Quad-Core Intel® Xeon® 5000 Processors and the Linux® operating system. Altix ICE offers an integrated blade architecture, including InfiniBand interconnect and software, high-end scalability, and advanced reliability and density features.

"With Altix ICE, the number of complete vehicle CFD models we'll be able to process could increase by a factor of five, which is key in adding performance to the car," says Diamant. "If we can increase our weekly throughput of parts analyzed, then we can find those fractions of a second that could ultimately give us an edge against the competition."

Supporting Honda's commitment to the environment

Although the outstanding performance of the Altix ICE was an important factor in the system's purchase, it was not the only one. One of the Honda Racing F1 Team's key objectives for 2007 was to raise awareness of environmental issues through the team's distinctive 'Earth Car' livery, and the myearthdream.com website on which visitors can both learn about the environment and make a pledge to change a part of their lives to help it. Since Altix ICE is one of the most energy-efficient platforms per processor core, the system had a very good match with the achievement of this objective.

"The Altix ICE solution with its built-in water cooling and power efficiency is one of the best in class for power and performance and provides a two-fold improvement over the power and performance of our previous system," explains Matt Harris, Technical Infrastructure Manager, Honda Racing F1 Team. "Even though the throughput of the system could increase by a factor of five compared to our old hardware, and it has a large increase in the number of processor cores, the Altix ICE uses only two-and-a-half times the energy of the previous system, so we're trying to make it as environmentally friendly an implementation as possible. Also, because Altix ICE has a diskless architecture, its reliability is unparalleled compared to other systems."

"We saw a range of alternative suppliers, and out of all of them, SGI came back with what we felt was the most comprehensive and convincing technical solution. They had a unique awareness of our requirements, and immediately understood what we needed," concludes Diamant. "SGI representatives were the only people who really thought about what the future might mean to us with our increased compute power — in terms of workstations, storage, model size, our future requirements, future growth, what we might need to do, and how the SGI system could scale and help us as a complete solution. So overall, choosing SGI as our partner for supercomputer solutions was one of the easiest decisions we've had to make this year!"

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