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Sailing ahead

KND-Sailing Performance harnesses Intel® Xeon® processor E7 v2 family to optimize ocean-racing yacht design

KND SailingPerformance

"The Intel® Xeon® processor E7 v2 family is a fantastic high-performance computer in a box for a small company like us, offering huge performance gains without breaking the bank."

Dimitri Nicolopoulos,
Founding Partner,
KND-Sailing Performance

Company

Headquartered in Valencia, Spain, KND-Sailing Performance consults on the design and optimization of racing yachts. Through a combination of computational fluid dynamics (CFD), velocity prediction programming (VPP) and data analysis, it advises clients on optimal yacht design as well as day-to-day refinements to ensure peak racing performance. KND employees have over 20 years of experience in automotive, aerospace and sailing numerical simulation and data analysis. KND-Sailing Performance's relentless focus on research and development means it remains at the leading edge.

Challenges

CFD analysis mimics hydrodynamic and aerodynamic flow around a yacht. It allows designers to refine yacht design prior to any physical build, thus helping to avoid costly errors, ensure optimal racing performance and reduce overall time to build. With hundreds of factors and variables to take into account, sailing in varying wind directions and forces, KND-Sailing Performance must carry out hundreds of different simulations. This process employs algorithms to analyze huge amounts of data, which is a very compute-intensive process. As a small business, the challenge for KND-Sailing Performance is to maintain the processing power of a supercomputing center for a fraction of the price.

Solutions

KND-Sailing Performance rolled out a server running the latest-generation Intel® Xeon® processor E7 v2 family. This processor offers up to twice the performance[1,2], triple the memory capacity[3], and up to quadruple the I/O bandwidth[1,4] of previous-generation Intel Xeon processors. KND-Sailing Performance is using the server to perform CFD simulations using Panel Code* as well as full RANS CD-Adapco STAR-CCM+* solver. These parallel programs make optimum use of the processors' 15 cores, thanks to Intel® Hyper-Threading Technology (Intel® HT Technology)[5], which enables multiple program threads to run on each core.

Benefits

"We were able to put the Intel Xeon processor-based server to immediate use to develop a detailed performance prediction for the next Volvo Ocean Race yachts. Teams who benefit from this program, like Abu Dhabi Ocean Racing and Dongfeng, will be able to start their program with an edge over the competition," explains Dimitri Nicolopoulos, founding partner at KND-Sailing Performance. "Thanks to the improved processing power of the Intel Xeon processor-based server we were able to quickly develop targets for trimming ballast, keel and dagger board, as well as a sail management chart. CFD analysis can help the team to eliminate days, sometimes months, of sailing to acquire the same level of knowledge.

Previously, the main limit to the number and complexity of simulations we could carry out was computing power," continues Nicolopoulos. "The Intel Xeon processor E7 v2 family is a fantastic high-performance computer in a box for a small company like us, offering huge performance gains without breaking the bank. The Intel team offered generous support throughout, reacting quickly to our every need and request for help."

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