

## **Experiences by using Itanium 2-based parallel computers for industrial CFD codes**

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In the summer of 2003 the CIRA will enlarge its supercomputing capabilities, today represented by the NEC SX6 vector/parallel supercomputer installed in 2002, with a scalar/parallel SMP system. To such intention, during the last months a series of activity of benchmarking have been performed using parallel applications of industrial use for the CFD, developed at CIRA, on the new parallel systems, recently developed by the main manufacturers of supercomputers and based on the processors Itanium-2 to 64 bit of Intel.

The activities of benchmarking have allowed to evaluate the performances of the various systems on a series of codes of aerodynamics and aerothermodynamics developed at CIRA, also comparing them with the performance on a vectorial system what the NEC SX/6.

The used codes resolve the Euler and Navier-Stokes equations in bi-dimensional and three-dimensional fields for transonic, supersonic and hypersonic flows. The parallel techniques are based on the domain decomposition techniques for the subdivision of the multiblock structured grids. MPI is used as environment for the message passing in order to get portable applications on the various architectures.

The study, finalized over whether to measure the performances (speed-up and scalability) has also been addressed to evaluate the robustness of the systems with the purpose to use them in an industrial aerospace environment.

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