Success Brief

Performance

Intel® Xeon® processor 5400 series

Aeronautic

AleniaAermacchi
A Finmeccanica Company

Aermacchi chooses Intel® processor technology for faster design

Leading Italian aircraft company chooses Intel® Xeon® processor 5400 series to reduce the time needed for fluid dynamic and acoustic simulations.

Alenia Aermacchi is a leading company in the design, production and support of aircraft for training military pilots. It is also involved in several programs for providing nacelles for civil aircraft. Computational Fluid Dynamics (CFD) is an integral part of its design and analysis procedure and modern CFD techniques used in Aermacchi can accurately predict the performance of innovative solutions a long time before they are implemented on aircraft, without needing to build scale models. However, the company wanted to speed up this process and as result implemented Dell servers powered by multi-core Intel® Xeon® processors and 64 GB of memory. This increased the number of configurations analysed per unit time by 70 per cent. Greater computing power and extensive memory addressing also ensured the company could carry out more detailed model simulations.

"Thanks to the new Dell* machines with Intel® Xeon® processors, we have today reduced the time needed to design a new acoustic panel to a third."

Spokesperson,
Alenia Aermacchi

- **Faster design.** Alenia Aermacchi wanted to cut the time required for fluid dynamic and acoustic aeronautical simulations.
- **New server platform installed.** Dell servers powered by Intel® Xeon® processor 5400 series were implemented in its data centre to run its computer aided design applications.
- **Reduced time, more power and greater efficiencies.** The time required to run simulation configurations dropped by 70 per cent, greater computing power enabled more detailed simulations and virtualisation was introduced into the data centre leading greater efficiencies.

Alenia Aermacchi has supplied nacelles, the enclosed part of an aircraft in which the engine is carried, for several civil aircraft since the mid nineties when they acquired the design and technological capability to build the cold parts, lip, fan cowl, acoustic liner and EBU.

An increasingly important aspect in the design of new engines is noise, and the task of the acoustic panels is to attenuate the noise from the main source: the engine fan. However, noise tests performed both on the ground and in flight are very complex and expensive.

Computer simulation of how panel noise behaves as the various parameters change is fundamentally important for optimising each engine and aircraft. The software needed to achieve this has to be able to carry out accurate analysis in a short time using very large numerical models.

Aermacchi computer aided design becomes far more efficient

Computational fluid dynamics (CFD) is an integral part of this design and analysis procedure at Alenia Aermacchi. Modern CFD techniques used in Aermacchi can accurately predict the performance of innovative solutions a long time before they are implemented on aircraft, without needing to build scale models.

CFD applications work by breaking the region concerned down into a large number of cells (control volumes). The average differential equations, known as Napier-Stokes, are solved for each cell, thus providing a complete fluid flow picture up to the resolution allowed by the mesh.

To increase the number of configurations analysed by unit time and to also enable more detailed model simulation, the company implemented Dell* servers powered by Intel Xeon processor 5400 series.

This computing platform allowed Alenia Aermacchi to increase the number of configurations analysed per unit time by 70 per cent. It also enabled a more detailed model simulation that required thanks to greater computing power and extensive memory addressing.

A spokesperson for Alenia Aermacchi, said: "Thanks to the new Dell* machines with Intel processors, we have today reduced the time needed to design a new acoustic panel to a third."

Choosing multi-core Intel Xeon processors have not only improved design processing time, but has also brought the company IT department a further series of benefits. For example, it has been able to utilise the new servers based on the Intel Xeon processor 5400 series to create virtual machines. As a result, the company was able to reduce the space required in its data centre while also anticipating future energy savings.

Luca Romani, Large Accounts Director, Intel Italy and Switzerland, said: "Alenia Aermacchi is an important Italian company in the aeronautical sector that has chosen our Intel Xeon processors and right from the early testing stages, these processors delivered excellent results. The creation of a virtual environment has also allowed the IT department to significantly consolidate its data centre optimise its management."

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Spotlight: Alenia Aermacchi

- Alenia Aermacchi is a world leader in the design, production and support of military training aircraft and offers the largest range of products that meet training requirements.
- Founded in 1913, the company has built over 7,000 aircraft for approximately 40 nations. It is based at Venegono Superiore, (Varese Province, Italy) with facilities that include airfield, extensive structural laboratories and workshops, and wind and water tunnels. It employs approximately 1,850 people.
- The company has always designed and developed its aircraft autonomously with highly qualified personnel and leading-edge technologies.

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