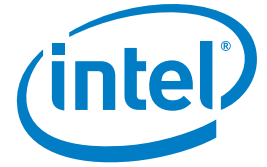


CASE STUDY

Intel® Xeon® processor
5500 series

High-Performance Computing
Data-Intensive Computing



Maintaining a leading position in the marketplace

Hutchinson speeds up research and development thanks to Intel multi-core technology & collaboration initiated around new generation of parallelised solver.

Working with some of the largest names in the automotive, aerospace and construction industries, Hutchinson consistently brings to the marketplace new technologies to improve our safety, comfort and well-being. This innovation relies heavily on the company's high-performance computing (HPC) cluster, which is used to run "solvers" for solving mathematical systems of equations to create simulations. This enables Hutchinson to better understand how components interact in the real world. By improving the performance of its HPC cluster, Hutchinson can speed up research and development, helping it to remain competitive.



"We have initiated collaboration with Intel to optimise source code of our solvers in order to return the best possible performance on our new HPC cluster based on the Intel® Xeon® processor 5500 series."

Daniel Benoualid,
CTO, Hutchinson

CHALLENGES

- **Meet demand for thorough testing.** Generate increasing number of simulations required to meet rigorous testing demanded by our R&D engineers
- **Optimise hardware and software performance.** Return the best possible performance of solvers running on its high performance computing (HPC) cluster to create these simulations

SOLUTIONS

- **Harnessing multi-core technology.** Installing an HPC cluster based on the Intel® Xeon® processor 5560 with four cores doubles hardware performance node on node compared to previous Intel Xeon processor 5100 series with two cores per socket
- **Working towards optimal software performance.** Collaborating with the engineers from Intel Software and Services Group to ensure optimal performance of its software to run on multi-core processors

IMPACT

- **Greater results, shorter timeframe.** Hutchinson wish to reduce timeframe calculation through faster HPC performance and optimal software performance
- **Faster time to market.** Research and development speeds up, reducing the time to deliver optimised products to end customers and helping Hutchinson to remain the preferred component supplier of choice to manufacturers – Hutchinson's car manufacturing customers in particular have been able to reduce concept time drastically

More simulations, greater performance

Hutchinson's research and development process depends on computer simulations that offer understanding into how products and technologies will perform in the real world. Over the years it has developed a real competence around finite elements software applications. It runs these applications on its high-performance computing (HPC) cluster.

In the 90s, Hutchinson used the Convex vector supercomputer. It switched to distributed architecture memory cluster based on Intel processors in early 1997, running a Microsoft Windows* operating system. Then, regularly, it refreshed its HPC cluster with subsequent generations of Intel server processors.

Over recent years, several factors have conspired to dramatically increase the number of simulations that must be carried out in the development of new technologies. Hutchinson is a major provider of products, such as engine mounts, sealing systems and so on, to the aerospace and automotive industries, among others.



The Intel Xeon processor 5500 series with four cores doubles performance of the HPC

Hutchinson is always investigating how the components perform with the whole end system, which means that the mathematical model size that needs calculating is always growing. For example, if Hutchinson develops an engine mount, it must simulate vibration of the mount alone and vibration of the whole engine.

Secondly, it is no longer sufficient for Hutchinson to create one simulation from a set of input data. Hutchinson has to provide a robust solution, which means that it must perform a design experiment and also non-stochastic simulations. This means that the number of simulations is increasing drastically.

This increase in the size of models coupled with an increasing number of simulations are the two major reasons why Hutchinson has decided to refresh its HPC cluster, allowing the company to remain strongly competitive within its market segment.

Hardware and software optimisation

Hutchinson upgrades its HPC cluster every three years. As part of this regular refresh cycle, it benchmarked the performance of the Intel® Xeon® processor 5560 with four cores. When compared to its current Intel Xeon processor 5100 series with two cores, the Intel Xeon processor 5560 performed

twice as fast, node on node. It also significantly increased the memory capacity of each node, from 2-4GB to 24GB.

By replacing its existing HPC cluster with multi-core nodes and then increasing the number of nodes, Hutchinson realised it would be able to drastically improve the performance of its HPC. For this reason it chose to deploy 48 IBM x3550 M2* servers powered by 100 Intel Xeon processors 5560 running in a Linux* operating system to replace its existing HPC.

Superior hardware performance is not the only contributing factor in Hutchinson's decision to deploy an Intel® architecture. For the last three years Hutchinson has benefited greatly from using Parallel Direct Sparse Solver Interface (PARDISO). Further, Hutchinson has started a collaboration with engineers from the Intel Software and Services Group promises to return even faster results on the Intel Xeon processor 5560-based HPC by further optimising the performance of Hutchinson's software library to run on multi-core processors.

Delivering far-reaching benefits

Increasing the performance of the HPC and of software running on the HPC enables Hutchinson to create more in-depth simulations in a shorter timeframe. In turn, this speeds

Spotlight on Hutchinson

Founded in 1853, Hutchinson offers know-how, skills and technological expertise for improved performance in safety, comfort and well-being. Through its five specialities (vibration, acoustic and thermal insulation; sealing systems; fluid transfer systems; transmission and mobility systems; and protection and care), Hutchinson is the preferred partner of the major air, land and marine transport groups. Hutchinson is established the world over. Its development and production centres cover Europe, the Americas and Asia, allowing its clients to reap the benefits of a worldwide network with local service.

up the research and development process, reducing the time it takes Hutchinson to deliver thoroughly tested products and technologies to its end customers.

This has wide-ranging benefits, helping to improve the safety, comfort, reliability and environmental impact of manufacturing across many industries including automotive, aerospace, construction, defence, railroad, heavy truck, marine, and sports and leisure.

Hutchinson's customers can be sure they receive the highest quality products and technologies in the shortest possible timeframe, helping the company maintain its position as the supplier of choice and remain competitive within the marketplace.

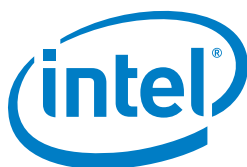
Find a solution that is right for your organisation. Contact your Intel representative or visit the Reference Room at www.intel.com/references.

Performance:

Data-Intensive Computing. Support the most demanding business data processing and computationally intense graphics.

To learn more about Intel's Predictive Enterprise strategy visit

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