



## Success Brief

Dual-Core Intel® Itanium® 2  
processor technology

“Dual-Core Intel®  
Itanium® 2 processor  
technology has  
enabled us to  
double our capacity  
from one simulation  
a day to two a day.”

# Dual-Core Intel® Itanium® 2 technology running HP Integrity servers boosts BMW's aerodynamic simulation capacity

BMW Group is the world's largest manufacturer of premium vehicles. With production facilities in 13 countries and sales operations in 41 global territories, the parent company of the BMW\*, MINI\* and the Rolls Royce\* brands has set the gold standard for vehicle quality the world over. In its 2006 financial year it recorded a record-breaking €4.2 billion (USD\$ 5.7 bn) pre-tax profit, marking it out as one of the most successful manufacturers in a fiercely competitive industry.

In December 2005, the company announced a sweeping partnership with Intel Corporation. The alliance, based on mutual acknowledgement of each other's clear leadership in their respective spheres, spans a range of areas including technology, co-marketing and Intel's sponsorship of the BMW Sauber F1 Team.

### The search for perfection

BMW relentlessly strives to improve new generation vehicle design. For example, fuel economy, wind-noise reduction and vehicle handling are areas it endeavours to advance and refine. Critical to this process is the detailed scrutiny of complex air and fluid flows as they move in and around vehicle bodies.

This analysis is achieved through the use of the extremely sophisticated simulation software, PowerFLOW\* from Exa Corporation\*. This measures lift, drag, friction, temperatures and other factors, allowing its engineers to establish the best design options before embarking on the costly process of physically building and testing prototypes.

PowerFLOW software mimics fluid flow and airflow by representing and analysing information in millions of microscopically small cells. The number of cells used can be adjusted, but the more cells used the more information garnered. It's also extremely computing intensive and needs a system that provides outstanding speed and muscle.

Mr. Wagner, BMW Group, says: “We were keen to evaluate the performance of HP Integrity Superdome\* servers powered by the Dual-Core Intel® Itanium® 2 processor 9000 series, with a view to increasing the number of simulations we can carry out in a day.”

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### Measures of Success

- By deploying 2 HP Integrity Superdome powered by the Dual-Core Intel Itanium 2 processor 9000 series, BMW was able to carry out twice the number of simulations in the same length of time it previously took to carry out one
  - More efficient and faster simulations lead to quicker prototype design, enabling BMW to maintain its market leading position
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# Dual-Core Intel® Itanium® 2 processor 9000 series provides BMW with a platform for major improvements in design simulation

Previously BMW had been using an HP 9000 Superdome\* server-based infrastructure running on the single-core Intel® Itanium® 2 processor 9000 series, to drive the PowerFLOW\* simulations. It launched an extensive evaluation of HP Integrity SuperDome servers powered by Dual-Core Intel Itanium 2 processor 9000 series.

The benchmarking test used about 48 million cells in the external aerodynamics simulations. With the single-core processor the company was typically analysing about 20 million cells in a single day's simulation.

Mr Gruen, BMW Group, says: "The dual-core processor based-servers boosted the analytical capability of PowerFLOW by more than double, up to 45 million cells in a single day's simulation, compared to 20 million cells using the single-core platform."

Following the impressive results, BMW deployed 2 HP Integrity Superdome servers powered by 128 Dual-Core Intel Itanium 2 processor 9000 series. As a result, the platform has significantly improved the speed and efficiency of design simulations while also lowering hardware costs thanks to consolidation.

## Return on Investment

- Dual-Core Intel® Itanium® 2 processor 9000 series significantly improved the performance of PowerFLOW\* simulation software
- Analyses up to 45 million cells a day compared to 20 million cells a day using an HP Superdome\* Server-based infrastructure running on the Single-Core Intel Itanium 2 processor 9000 series
- Increased analytical capability enables more detailed analyses resulting in far greater data interpretation accuracy and more informed insight into the development of vehicle prototypes



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