CASE STUDY
Intel® Xeon® processor 5600 series
High-performance computing

Flying high

T-Systems increases supercomputer-performance with Intel® Xeon® processor 5600 series

T-Systems, a subsidiary of Deutsche Telekom, is a large global provider of information and communications technology services spanning compute clients, data centres and networks. A part of its wide portfolio are high-performance computing services. Within these, T-Systems aimed to provide the Center for Computer Applications in AeroSpace Science and Engineering ($C^2A^2S^2E$) – a joint-venture of the German Aerospace Center (DLR), Airbus, and the federal state of Niedersachsen (Lower Saxony) – with more processing power for their HPC code and design operations. However this needed to be within the constraints of a fixed power budget. To meet these objectives, T-Systems has decided to implement a 648-node cluster powered by Intel® Xeon® processor 5600 series to replace its existing platform.

T-Systems

"The superior performance and power-efficiency of the Intel® Xeon® processor has provided a platform for T-Systems to develop its HPC services, strengthening the market position while remaining within stringent power consumption parameters."

Alfred Geiger
Solution and Innovation Manager, HPC
T-Systems

CHALLENGES

- **Customer binding:** T-Systems wants to improve its high-performance computing for two of its customers, DLR and Airbus, by offering greater performance and scalability
- **Power constraints:** It had strict power consumption parameters that had to be met to ensure the total cost of the HPC service did not become too high

SOLUTIONS

- **Watts and performance:** T-Systems benchmarked Intel® Xeon® processor 5600 series running against former solutions.
- **Faster and lower:** Intel Xeon processor 5600 series met the end-customers' required performance increase over the existing system, through convincing single-core throughput while staying within the predefined power budget

IMPACT

- **New system:** T-Systems has begun implementing a 648-node system powered by Intel Xeon processor 5600 series to replace its existing system
- **Customer satisfaction:** Customers gain more performance and scalability for full virtual simulations
- **Greater marketplace standing:** T-Systems assures its position as a full service provider in the HPC-market

Taking to the air

In Germany, two large HPC-customers of T-Systems, DLR and Airbus, make use of this service, delivered through a joint competence-centre called the Center for Computer Applications in AeroSpace Science and Engineering ($C^2A^2S^2E$). DLR. This organisation owned by the German government, provides services to the aerospace industry including Airbus, a leading manufacturer of aeroplanes.

Within the context of $C^2A^2S^2E$, DLR develops HPC code that is used by several institutions within the industry. Airbus, in particular, uses this code for R&D work on virtual product development. The close partnership between these two organisations within $C^2A^2S^2E$ allows Airbus to uniquely create fully simulated aeroplanes and test them in a full-life simulation. This helps Airbus to test, refine, and bring its next-generation products to the marketplace in a considerably quicker way.

Processing muscle empowers partnership to greater production

Powerful muscle

T-Systems is the provider of the HPC muscle for the partnership between DLR and Airbus. As well as T-Systems' overall offerings, HPC is also used in close connection to the end customer's core processes.

To strengthen ties with important customers, T-Systems wanted to further develop this area of business by offering the DLR / Airbus partnership optimised application performance and processing power, thus ultimately improving end-user business value. However, this objective had to be achieved within the operational constraints of the existing platform. That meant that T-Systems had to keep power consumption in mind as a rising energy bill would have undermined its aims to offer greater efficiency.

The basis for comparative tests with the Intel® Xeon® processor 5600 series was provided by an existing HPC installation delivered by T-Systems for DLR and Airbus. This system was based on a 768-node blade server cluster powered by an older processor.

Speed burn

T-Systems carried out benchmark tests on a server with the Intel Xeon processor 5600 series running DLR's production HPC code. These tests proved the desired performance increase by a factor of three over the existing platform while staying within the desired power budget. In addition, the low number of processor cores necessary to hit the stated performance goal made this configuration especially attractive to T-Systems and its end customers: the Intel Xeon processor 5600 series' high single core performance delivered world-class performance with low algorithmic complexity.

Alfred Geiger, solution and innovation manager for HPC at T-Systems, said: "Previously, we had been in conflict between performance and scalability. We wanted to offer our customers better performance and scalability, but without consuming more power. The greater single-core performance and moderate energy consumption of the Intel Xeon processor allow us to do this now."

Spotlight on T-Systems

Drawing on a global infrastructure of data centers and networks, T-Systems operates information and communication technology (ICT) systems for multinational corporations and public sector institutions. On this basis, Deutsche Telekom's corporate customers arm provides integrated solutions for the networked future of business and society. Some 45,300 employees at T-Systems combine industry expertise with ICT innovations to add significant value to customers' core business all over the world. The corporate customers unit generated revenue of around EUR 8.8 billion in the 2009 financial year.

All change

T-Systems has now begun replacing its existing platform with a 648-node blade server system powered by the Intel Xeon processor 5600 series. Because the system remains about the same size as the previous one, while offering performance and power consumption benefits, T-Systems helps deliver faster results for the European aerospace industry as a whole and is able to demonstrate its HPC leadership.

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

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