CASE STUDY

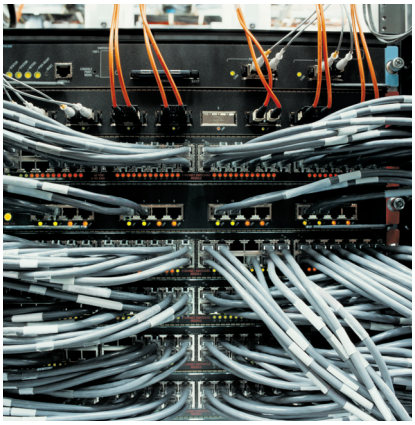
Intel® Xeon® processors 5500 and 5600 series

Enterprise Server
High-Performance Computing
Energy Efficiency: Environment and Performance
Performance: Data Intensive Computing
Virtualization: Dynamic Resource Management

Innovation through Collaboration

Enterprise-class performance for all through Intel and IBM teamwork

Data centre needs are evolving rapidly. As computational power increases and usage models become more complex, high-performance computing facilities are no longer the preserve of large organisations. IT departments in a wide variety of industries are now eager to bring these technologies to their own users in a cost effective way, and are looking to their IT solution providers to help them tailor such resources to their environments. Recognising its responsibility - as a leading technology vendor - to meet these requirements, IBM is committed to developing efficient, dense solutions for rapidly scaling data centre operations.



"By incorporating the innovative Intel® Xeon® processor technology into our iDataPlex* platform, we're offering our customers a compelling IT mix which will help them achieve their goals while staying within budget."

Fernando García Estevez, Director of the Server System x Division for Spain, Portugal, Greece and Israel, IBM

CHALLENGES

- **Data centre growth:** Organisations of all sizes now demand enterprise-class performance at a compelling price
- **Stay competitive:** IBM was eager to develop a differentiated solution for its customers

SOLUTIONS

- **Strategic teamwork.** Intel and IBM have a strong track record for working together to drive innovation
- **Latest technology.** By testing Intel® Xeon® processors 5500 and 5600 series, IBM identified solid benefits to pass on to its customers
- **Tailored solution.** Proven Intel technology integrated into specially developed IBM iDataPlex dx360 M3* platform

IMPACT

- **Movie magic.** Prominent Spanish film studio deployed high-performance solution to meet challenging system demands for its latest production
- **Scientific networking.** National Grid Computing initiative for scientists built on cost- and space-effective iDataPlex
- **Cloud hosting.** Enhanced computational density of platform helps hosted service provider manage more business for less

Collaborating for Customer Benefits

As one of the world's largest IT companies, IBM is committed to bringing innovation to the mechanical design of data centres in order to help customers of all sizes to optimise their computing capabilities. As part of this vision, it has developed the IBM iDataPlex dx360 M3* server product especially for organisations that require high performance but are constrained in terms of floor space or power and cooling.

"Our customers want the best technologies to support their mission-critical activities, and that's true whatever business they're in," explains Fernando García Estevez, Director of the Server System x Division for Spain, Portugal, Greece and Israel, IBM. "We have a long-standing and fruitful relationship with Intel so it made sense for us to include the latest Intel® processor technologies in this product."

Energy and cost efficient solution drives success in projects from research to film-making

"We have a long-standing and fruitful relationship with Intel so it made sense for us to include the latest Intel® processor technologies in this product."

Fernando García Estevez, Director of the Server System x Division for Spain, Portugal, Greece and Israel, IBM

IBM carried out detailed research and testing into how to combine the two technologies most effectively. Having evaluated the Intel® Xeon® processor 5500 series, and later the Intel® Xeon® processor 5600 series, it found that they could deliver significant benefits to its customers:

- The Intel Xeon processor 5500 series brought a 2.25x performance gain over the previous generation and IBM has now built on this with the Intel Xeon processor 5600 series to drive an additional 60 percent gain.
- In terms of energy efficiency, the Intel Xeon processor 5500 series has reduced power consumption by 2.25x as well and cut system idle power by 50 percent compared to previous generations. The new Intel Xeon processor 5600 series increased performance in the same energy envelope by 36 percent.

The mix of reduced power consumption and boosted performance demonstrated by these tests showed IBM that it could help its customers achieve significant savings in their server environments. "It's numbers like these that mean the Intel technology is a perfect fit for our iDataPlex offering," continues García Estevez. "The combination of higher performance, memory bandwidth and efficient power draw in the processor chip is consistent with the iDataPlex value of performance per watt density to become really compelling for our customers."

Indeed, IBM has already seen customers in greatly varying fields – from scientific research to movie-making to hosted IT services – benefit from the flexible solution.

Creative Computing

Kandor Graphics (www.kandorgraphics.com) is a Spanish-based commercial film company that has seen considerable critical success in recent years, winning prestigious GOYA Awards (www.academiadecine.com) in 2008 for its film The Missing Lynx, and again in 2010 for The Lady and the Reaper. One of the partners of the company is Hollywood actor Antonio Banderas, meaning it garners a significant amount of media attention both nationally and overseas.

Antonio José Molina, CTO, Kandor Graphics, explains: "In tackling The Lady and The Reaper we encountered serious development challenges that we had not seen with previous film projects. Added to this, in order to improve the final film quality we had opted for a more demanding stereoscopic design. These factors meant we needed to enhance our server resources as well as our wider IT environment with the latest and best technology for better performance to complete the project within our deadline."

Energy efficiency was also a critical factor. The company's first feature film focused on environmental issues and endangered wildlife in the Spanish region of Andalucía, and it has a strategic commitment to reducing carbon emissions and cutting power usage.

Already a customer of IBM, Kandor Graphics therefore welcomed the opportunity to test the new iDataPlex product. "The results surprised us greatly," says Molina, "as we saw such a leap in performance with the new processor but without compromising on power consumption."

"After evaluating the Intel® Xeon® processors 5400 and 5500 series, we found that the Intel Xeon processor 5500 series gave us up to a 30% improvement in the rendering

System performance more than doubled using Intel® Xeon® processor 5500 series

Power consumption cut by 2.25x, with system idle power down by 50 per cent

process time. We are currently evaluating the Intel® Xeon® processor 5600 series and preliminary results indicate that the performance increase will also be substantial."

The team was also impressed with the reliability of the platform, which enable it to ensure its servers have high workloads at 100 percent utilisation, 365 days a year, 24 hours a day. Molina says: "There is no better test than daily use. The Lady and The Reaper has represented a sustained R&D and innovation effort for the entire company, with everyone putting potential new systems to the test. We also did computation tests with different rendering engines, platforms and technologies where we measured energy consumption from a wide variety of manufacturers. The iDataPlex platform powered by Intel Xeon processors 5500 series was, without doubt, a winner."

He concludes with a thought for Kandor Graphics' future projects: "Working side by side with both Intel and IBM on our new film Goleor, The Scales and the Sword gives us the reassurance that we will have a solid, secure foundation on which to build continued success. With the new technology we will provide film artists with tools to minimise development times and enable them to focus more on creativity instead of waiting for IT to do its job."

Sharing Scientific Resources

A very different group of iDataPlex users can be found at the Spanish Superior Council of Scientific Research (CSIC), the government body dedicated to the co-ordination, development and diffusion of science across the country. Its members are located nationwide, in 126 research centres and 145 associated groups.

Jesus Marco de Lucas, Member of the Institute of Physics of Cantabria is also the co-ordinator of the CSIC's Distributed Grid Computing Initiative to boost the computational power of data centres available to scientists in Spain. "We're working to develop a network of computing resources for use by researchers in any location," he explains. "As a government department, however, we must be careful about how we spend our budget. With so many centres, we needed to identify a server platform that was compact, easy-to-deploy and economical to run, but that also provided us with the computing power needed by our users. They're carrying out research into complex subjects like astrophysics and computational chemistry, using highly demanding applications, so reliability and performance per node are critical."

Testing of the IBM iDataPlex platform, powered by Intel Xeon processors 5500 series, against a number of options demonstrated its ability to meet CSIC's needs. In particular, a trial run was carried out using one of its key applications called SIESTA* (Spanish Initiative for Electronic Simulations with Thousands of Atoms*). Researchers use this program to perform electronic structure calculations and molecular dynamics simulations of molecules and solids, and they need optimum system performance to get results as fast as possible.

After investigating solutions from a number of vendors, Marco and his team found that the IBM and Intel solution was cost-effective for its usage model as well as being an easy-to-use solution. "We're very happy with the servers," he concludes. "I'm sure we'll be calling on the Intel-IBM team to support further projects in the future."

Spotlight on IBM

IBM is a leading company in the Information Technology industry. With total revenue of $95.8 billion in 2009, the company has more than 390,000 employees worldwide, and serves customers in 170 countries. In 2009 IBM invested $5.8 billion in Research and Development. IBM is aligned around a single, focused business model: innovation. IBM takes its breadth and depth of insight on issues, processes and operations across a variety of industries, and invents and applies technology to help solve its clients' most intractable business and competitive problems.

"That's a great business equation for us and means we're able to operate much more profitably."

Alvaro Montero de Lema,
Sales Manager, Ran Networks

Servers for Business Success

Elsewhere, one of Spain's leading hosting companies is also making use of IBM iDataPlex with Intel Xeon processor 5500 series. With more than nine years of experience in the industry, Ran Networks provides a variety of secure hosted IT and cloud computing services.

Its DEF.COM* cloud hosting service for Microsoft Windows* and Linux* environments is built on the Intel-IBM solution. It was chosen for its ability to help Ran Networks reduce its electricity consumption and cooling costs by over 20 per cent, although the primary factor in the decision was the solution's strong computational density. Each IBM iDataPlex rack server is able to host 2,000 DEF.COM server instances virtually, resulting in a significant cost saving compared to maintaining this many physical servers.

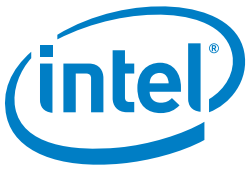
"The servers have enabled us to host a greater volume data for a lower overhead," comments Alvaro Montero de Lema, Sales Manager, Ran Networks. "That's a great business equation for us and means we're able to operate much more profitably."

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

Continued Collaboration

García Estevez, IBM, reflects: "We have a long history of joint innovation with Intel and extending this collaborative relationship to high-performance computing challenges through the iDataPlex initiative was a natural fit. Intel's broad technology expertise supports our different design points so that each product we develop together has different capabilities which can scale up to the high-performance compute environment or address low-power customer needs.

"Since teaming with Intel on the design and market introduction of this server innovation, we've seen many of our competitors validate the design point by announcing products with similar form factors and usability. We see this as validation of our smart choice, which has helped keep our companies at the forefront of IT innovation."



0610/JNW/RLC/XX/PDF 323984-001EN