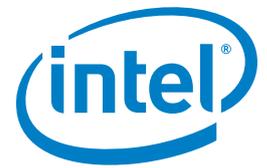


## CASE STUDY

Intel® Xeon® Processor E5-2670

Education

High-Performance Computing



# Making a Difference

Fujitsu and Universidad Autonoma de Madrid create ground-breaking supercomputing platform



“Our researchers are able to perform much more involved calculations now, and thanks to massive parallel computing they get their results faster. We can also carry out completely new research that was not possible before.”

Prof. Fernando Martín,  
Universidad Autonoma de Madrid

## CHALLENGES

- **Improve society.** Use Fujitsu’s industry-leading position and expertise to drive life-enhancing high-performance computing (HPC) research projects
- **Optimize technology.** Help Spanish organizations struggling with limited budgets to make the most of technology investments
- **Help scientists.** Researchers at Universidad Autonoma de Madrid needed a new HPC solution with greater performance, scalability and compatibility

## SOLUTIONS

- **Careful research.** Fujitsu spent time with the university team to understand its strategic and technical requirements
- **Powerful processors.** Fujitsu recommended Fujitsu PRIMERGY\* RX200 S7 servers powered by Intel® Xeon® processors E5-2670
- **Optimized environment.** Using Intel® architecture software development tools, the university made sure key research applications maintained strong performance

## TECHNOLOGY RESULTS

- **Research power.** The high-performance hardware and software platform gives complex scientific applications and processes a significant boost
- **User friendly.** The platform integrated easily with the existing operating system and applications to keep the user experience seamless during migration

## BUSINESS VALUE

- **Better, faster.** University scientists can perform much more complex calculations, while reducing time-to-results
- **New horizons.** New types of research are possible, creating the possibility of new life-enhancing applications
- **It can be done.** Fujitsu has proven to the research industry that ambitious HPC projects are possible even in the face of economic uncertainty

## High hopes for HPC

As a globally recognized expert in technology, Fujitsu works with some of the most innovative organizations in the world. It believes this privileged position brings with it a responsibility to make sure the innovations it supports are making a positive impact on society and the lives of individuals. Indeed, it has made a strategic commitment to achieve societal improvement through collaboration with its customers.

An area that lends itself well to supporting this aim is HPC, which is used by academic and scientific institutions to drive research and discoveries in areas as diverse as medicine, aerodynamics and statistical analysis. However, given the difficulties facing many of today’s economies, funding for these sorts of projects is not as readily available as it once was. This is particularly true in Spain, and Fujitsu wanted to enable its Spanish HPC customers to continue to achieve breakthroughs while maximizing limited investment capacity.

One such customer was Madrid’s Universidad Autonoma, one of the most prestigious universities in the country. Two of the university’s scientists are recipients of substantial European Union (EU) funding, through prestigious Advanced Grants sponsored by the European Research Council, for their research into molecular and condensed matter physics. Wanting to invest these funds as strategically and effectively as possible, the university was looking for a technology specialist that could not only deliver the hardware and software needed to optimize the scientists’ experiments, but that could also offer long-term strategic consultancy to ensure continued success.



## Fujitsu and Autonoma University create an industry-leading HPC environment to drive societal improvement

### A tailored platform

Fujitsu has a long-standing relationship with Universidad Autonoma and knew that it could deliver the right supercomputing solution. It started by meeting with the scientific team responsible for the X-CHEM\* project, which carries out complex chemical reactivity research. Fujitsu wanted to understand the strategic goals and requirements of the team's projects as well as the technologies needed to support their advanced calculations and simulations.

The key requirements for the supercomputing platform were extremely high performance and scalability. It was also important that any new hardware be easily compatible with Lustre\* open source software, which underpins some of the university's most important research applications.

As a long-time collaborator with Intel as well, Fujitsu saw immediately that the answer to Universidad Autonoma's challenge was an HPC solution powered by Intel architecture. "We recommended deploying the Intel Xeon processor E5-2670, which offers the high performance and energy efficiency that the university needs," explains Adriano Galano, director of the HPC and Big Data program at Fujitsu Spain. "Another compelling reason for this recommendation was the fact that the software development tools that come with Intel architecture make it easy to optimize it for any existing applications, even those that are based on notoriously-tricky Lustre open source."

The university was pleased with the proposed solution and implemented 144 Intel Xeon processors E5-2670 in 72 Fujitsu PRIMERGY RX200 S7 servers.

### Breakthrough performance

"By implementing this new solution to support its X-CHEM team, the university has demonstrated its commitment to improving and advancing scientific achievements in a highly prestigious and relevant field," says Galano.

The X-CHEM scientific leader, Prof. Fernando Martín, adds: "Our researchers are able to perform much more involved calculations now, and thanks to massive parallel computing they get their results faster. We can also carry out completely new research that was not possible before. For example, we can perform much more realistic simulations of laser-matter interactions. This is important in helping us design new experiments with greater potential for new applications."

As scientists at the university come to see the value that HPC can deliver, more and more of them are taking an interest in the facilities available. The new platform enables the university to meet this demand by having more concurrent users than before.

However, it's not just the researchers that benefit. "Engineers and technicians in the University Computer Center have been able to substantially improve their skills as well," Prof. Martín continues. "As a result, our facility is now at the forefront of supercomputing institutions in Spain and we are already

### Lessons learned

When tight budgets and ambitious objectives intersect, making the right decision is essential. This is where having support from the right experts can make all the difference. With its own strategic aims aligning closely with its customer's requirements, Fujitsu was able to offer in-depth consultancy and support to Autonoma University that resulted in an exemplary HPC solution that will set a new standard for Spanish supercomputing.

looking ahead. We hope to offer grants to outstanding masters and PhD students to enable them to make further discoveries. We will continue to work with Fujitsu and Intel to ensure the resources we are using are always the most suitable for the work we carry out."

The project has been highly beneficial for Fujitsu as well, as Galano explains. "This implementation is not only a tangible demonstration of our commitment to driving societal improvement through HPC, but it also acts as a showcase example for other universities of what can be achieved," he says. "We're proud that some of Spain's best scientists have chosen Fujitsu and Intel to support their research, and we look forward to working with other academic and research institutions in Spain to further enhance our country's scientific achievements."

Visit Intel's Technology Provider website at [www.inteltechnologyprovider.com](http://www.inteltechnologyprovider.com)

Find the solution that's right for your organization. Contact your Intel representative, visit Intel's Business Success Stories for IT Managers ([www.intel.co.uk/Itcasesudies](http://www.intel.co.uk/Itcasesudies)) or explore the Intel.co.uk IT Center ([www.intel.co.uk/itcenter](http://www.intel.co.uk/itcenter)).



Copyright © 2013 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Xeon and Xeon inside are trademarks of Intel Corporation in the U.S. and other countries.

This document and the information given are for the convenience of Intel's customer base and are provided "AS IS" WITH NO WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. Receipt or possession of this document does not grant any license to any of the intellectual property described, displayed, or contained herein. Intel® products are not intended for use in medical, lifesaving, life-sustaining, critical control, or safety systems, or in nuclear facility applications.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations, and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>

\*Other names and brands may be claimed as the property of others.

0213/JNW/RLC/XX/PDF

328828-001EN