Universidad de Cantabria supports the European scientific community

With a supercomputing solution from IBM

Overview

The need
Scientists at the university wanted to develop extremely complex projects such as processing maps of the universe, searching for new sub-atomic particles and supporting personalized medicine.

The solution
Implemented a supercomputing solution based on IBM® System x® servers featuring Intel® Xeon® processors, IBM System Storage® devices and IBM General Parallel File System (GPFS™) software.

The benefit
Enables Universidad de Cantabria to support the Spanish and European scientific communities; boosts scientific progress and encourages collaboration with public and private institutions.

Universidad de Cantabria is a public university located in Santander, northern Spain. Established in 1972, the university has more than 12,000 students enrolled, and is now rated among the ten top universities in Spain according to a recent report developed by the Spanish Fundación Conocimiento y Desarrollo (Institution for Education and Development).

The Instituto de Física de Cantabria (Cantabria's Physics Institute) is a joint research center, uniting the University of Cantabria and the National Research Council (CSIC), relevant at both the regional and national level and participating in many international projects. Founded in 1995, the institute plays an important role in developing studies in a number of areas, including astrophysics, cosmology, complex physics, advanced computing and e-science, and climate change.

Keeping up with Europe's most-advanced scientific institutes

Jesús Marco de Lucas, Spanish National Research Council (CSIC) Researcher at the Instituto de Física de Cantabria, comments, "Universidad de Cantabria has always been committed to driving scientific progress across Europe by developing and supporting projects within several highly specialized fields. To do so, we need a computational infrastructure that is as advanced as our research."

Scientists at the university wanted more computing power to run extremely complex computational projects that included processing large maps of the universe, simulating ocean waves and tsunamis, searching for new sub-atomic particles, and supporting the development of personalised medicine.

To support these research projects, Universidad de Cantabria embarked on an ambitious project, funded by the INNOCAMPUS national initiative, to build a supercomputing environment not only for its internal researchers, but also for the Spanish and European scientific community as a whole.

Solution Components

Hardware

- IBM® System x® iDataPlex® dx360 M4 servers with Intel Xeon E5-2600 processors
- IBM BladeCenter® PS702 Express
- IBM System x3650 class servers
- IBM System x3550 M4 servers
- IBM System Storage® DS3500 Express
- IBM System Storage DCS3700
- IBM System Storage EXP3000

Software

- IBM® General Parallel File System (GPFS™)

Services

- IBM Global Technology Services®

Strengthening external partnerships

The university also wanted to foster greater collaboration with external corporations in Cantabria, such as those in the Parque Científico y Tecnológico de Cantabria, a regional governmental initiative which aims to promote the socio-economic wealth of the region, and other companies within the financial, telecommunications and energy sectors.

"In the Cantabria region there are several institutions that are very interested in energy distribution and consumption," says Jesús Marco de Lucas. "Universidad de Cantabria wanted to give them an opportunity to gain a better understanding about how to optimize the use of energy."

Universidad de Cantabria also aims to provide greater support to the Hospital Universitario Marqués de Valdecilla, by helping the hospital's IT department to take advantage of new opportunities within personalized medicine, a field which requires extremely fast processing of massive volumes of genetic data.

"Our previous IT system was not powerful enough to support the intense requirements of such research projects," states Jesús Marco de Lucas. "If we wanted to provide both the scientific community and private companies with innovative tools for their analysis and projects, we needed a completely renewed IT environment with considerably higher processing power."

High Performance Computing solution with IBM

Working with IBM, and also in collaboration with the Barcelona Supercomputing Center, BSC, Universidad de Cantabria – supported by the Instituto de Física de Cantabria – designed ALTAMIRA, a supercomputer based on IBM System x servers powered by Intel® Xeon® processors and running Scientific Linux, with IBM System Storage devices and IBM General Parallel File System (GPFS) software. IBM Global Technology Services® helped Universidad de Cantabria to deploy the solution.

ALTAMIRA is a solution based on x86 architecture. It includes IBM System x iDataPlex® dx360 M4 servers with efficient and powerful Intel Xeon processors E5-2670, dedicated to research projects with scientific applications that require high-speed access to large volumes of data, especially in the physics and climate-change fields. IBM System x3650 servers run the IBM GPFS software, enabling fast and reliable storage and parallel access to large volumes of file-based data.

Universidad de Cantabria deployed IBM GPFS software over two network architectures: an InfiniBand architecture provides high-throughput, low-latency connections for local supercomputing applications while a 10 Gb/s Ethernet network connects to the Spanish Academic Network.

"We are very satisfied with this innovative solution. Having IBM as our partner will help guarantee that the solution is always kept up and running, and that our systems will remain up-to-date. This will provide us with all the resources and power we need to drive scientific progress in Spain and Europe."

— Jesús Marco de Lucas, Spanish National Research Council (CSIC) Researcher at the Instituto de Física de Cantabria

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UNIVERSIDAD DE CANTABRIA

Supporting innovative scientific research

Thanks to the IBM ALTAMIRA supercomputing solution, Universidad de Cantabria has succeeded in creating an environment which helps to drive scientific progress across Europe, and encourages closer collaboration with private enterprises.

By considerably boosting data processing and data storage performance, Universidad de Cantabria has gained the ability to tackle new and more challenging research projects, including environmental ones and other initiatives focused on more personalized medical care.

Thanks to the IBM high-performance computing solution, Universidad de Cantabria and the Instituto de Física de Cantabria can now also increase the support for innovative research into particle physics and further the study of new particles, such as the Higgs boson – a hot topic in contemporary science.

Jesús Marco de Lucas adds, "The new IBM supercomputing solution features 80 teraflops of processing power, twenty times more than our previous environment. The new solution is also highly energy-efficient: thanks to the innovation offered by the Intel Xeon processors E5-2600 we have been able to generate energy savings of around 30 percent compared with the previous generation of processors."

The Intel Xeon processors E5-2600 are highly energy-efficient. The Intel® Intelligent Power Technology feature automatically regulates power consumption to combine industry-leading energy efficiency with intelligent performance that adapts to variations in workload.

In June 2012, the IBM ALTAMIRA supercomputer was rated among the Top 500 most powerful supercomputers across the world, and among the best 50 in the Top Green list in terms of energy efficiency.

The university is now also in a better position to build collaborations and strengthen relations with external institutions, such as the Parque Científico y Tecnológico de Cantabria and the Hospital Universitario Marqués de Valdecilla.

Jesús Marco de Lucas concludes, "We are very satisfied with this innovative solution. Having IBM as our partner will help guarantee that the solution is always kept up and running, and that our systems will remain up-to-date. This will provide us with all the resources and power we need to drive scientific progress in Spain and Europe."

For more information

To learn more about high performance computing solutions from IBM, contact your IBM sales representative or visit:
ibm.com/systems/x/solutions/hpc

IBM España S.A.
Santa Hortensia 26-28
28002 Madrid

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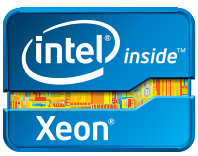

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