FUJITSU

Case Study
Universidad Autónoma de Madrid

» Supercomputing is more than just another tool; it requires systems and servers that meet the needs of researchers, and Fujitsu boasts the most advanced technology for satisfying such needs «

Alberto Luna, Director of the Scientific Computing Center, Universidad Autónoma de Madrid

THE CUSTOMER

Country: Spain
Client: Universidad Autónoma de Madrid
Sector: Education
Website: www.uam.es/ss/Satellite/es/home/

CHALLENGE

Execution of a supercomputing project at the Scientific Computing Center at UAM, following the awarding of Advanced Grants from the European Research Council (ERC) to two professors at the university.

APPROACH

Installation of servers and equipment with a high processing or High Performance Computer (HPC) power, providing researchers with a technological infrastructure that will meet the needs of both projects.

The customer

Universidad Autónoma de Madrid (UAM) is one of the most prestigious public universities in the country and is internationally renowned for its teaching excellence and its devotion to research. The campus is located in Cantoblanco, Madrid, with over 32,000 students and 3,000 lecturers and professors, and is a pioneer in the smart, massive use of technology, not to mention an international center of reference in research and knowledge transfer.

Since it was founded in 1968, it has opened seven departments and has a number of its own research institutes and centers associated with the Consejo Superior de Investigaciones Científicas (National Council for Scientific Research, CSIC).

The UAM's Scientific Computing Center uses the latest technology to achieve maximum performance thanks to its processing power.

The challenge

Professors Francisco José García Vidal and Fernando Martín were awarded two Advanced Grants from the European Research Council, aimed at providing established researchers with the means to take new directions in their respective research fields over a 5-year period.

The research work carried out as part of the Xchem project, led by Prof. F. Martín, aims to make it possible to control the chemical reactivity of substances, with experiments being designed using supercomputers.

Prof. Garcia Vidal's Plasmonanoquanta project, meanwhile, requires a huge computational capacity that makes it possible to solve equations that without this type of technology would simple not be viable due to their complexity.

Following the awarding of the ERC grants, the UAM has new goals to reach and new needs to be met, for which technology with a high computing capacity that makes it possible to solve equations and carry out scientific research in new fields that were not previously possible, or to which a great deal of time was invested, is required.

THE BENEFIT

- Research power: The ability to perform highly complex equations that require a very high computing power
- Ease of use
- Improved performance and energy efficiency
- Facilitating the development and simulation of experiments for scientists
- Economic viability

PRODUCTS AND SERVICES

- HPC (High Performance Computing) project and supercomputing architecture
- Fujitsu ETERNUS DX90 and DX80 storage systems
- Fujitsu server PRIMERGY RX200S6, RX200S7
- Fujitsu PRIMERGY RX200 S7 computing nodes with the latest Sandy Bridge technology
- Fujitsu ServerView Suite - management and administration
- InfiniBand System

The solution

Fujitsu attended a series of meetings with the client, during which the requirements outlined and the needs resulting from the awarding of the Advanced Grants were carefully examined, and put forward a more appropriate technological solution for meeting the challenge set out by the UAM in the form of the installation of a supercomputing technology that meets strict performance criteria thanks to the latest-generation systems and processors, great scalability and cutting-edge technology. All of the relevant market standards were also taken into consideration. The solution comprises two parts, designed to meet the needs of each project:

With regards to Prof. F. Martín's Xchem project, on the one hand, Fujitsu proposed a storage solution specially designed to provide the best possible levels of performance in an HPC environment with ETERNUS systems, based on a free software solution (LUSTRE) that helps guarantee reliable operation and provide sufficient guarantees, combined with a series of computing nodes, PRIMERGY servers with INTEL processors with great benefits in terms of high availability, reliability and scalability and a connection login server, as well as the communications infrastructure required to complement the hardware provided. This solution is based on an 8GBps SAN FC network design, which allows for future growth and escalations.

For Prof. Garcia Vidal's Plasmonanoquanta project, meanwhile, Fujitsu put forward a solution based on the Direct Attached Storage (DAS) architecture for direct connectivity between dedicated PRIMERGY servers and ETERNUS disc systems (without the need to invest in an 8GBps SAN FC network, provided that it is not needed for the purposes of meeting performance requirements), and encouraging greater investment in computing nodes to maximize calculation possibilities.

As a result, information technology ceased to be an obstacle to and instead became an important part of scientific research, making this one of the primary supercomputing projects to be developed in our country.

The benefit

The benefits offered by this solution can be felt in the following ways:

- Research power. The high-performance hardware and software platform provides researchers with a number of complex scientific applications designed to significantly boost momentum
- Ease of use. The platform is easily integrated into the existing operating system and applications for a seamless user experience during the change process
- Better and faster. The scientists at the UAM can now perform far more complex calculations, reducing the time it takes to obtain results in addition to saving energy
- New horizons. New types of research are now possible, including the simulation of experiments and the creation of applications that have a positive impact on society
- Viability. Fujitsu has demonstrated to the research industry that ambitious HPC projects with tight budgets are indeed possible in a context of economic uncertainty.

In the words of Professor Fernando Martín, *"Our researchers are now able to perform far more complex calculations and thanks to the computing system available they can obtain results far more quickly. We can also perform brand new studies that were simply not possible before."*

Conclusion

The solution involves the installation of systems and servers that meet the needs of a supercomputing environment, enabling greater scalability, profitability and compatibility.

About Fujitsu

Fujitsu is the leading Japanese information and communication technology (ICT) company offering a full range of technology products, solutions and services. Approximately 170,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers. For more information, please see www.fujitsu.com

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