¡Viva High-Performance Computing!
IPICYT Gets an Edge in HPC from Atos and Intel

How a scientific research institute in Mexico bolstered Atos Bull HPC Solutions computing power with the new Intel Xeon processor.

IPICYT
INSTITUTO POTOSINO DE INVESTIGACIÓN CIENTÍFICA Y TECNOLÓGICA, A.C.

Atos

The context

The Institute for Scientific and Technological Research of San Luis Potosi (IPICYT) is a public multi- and interdisciplinary research center in Mexico. It was founded in November 2000 as part of Mexico's National Council of Science and Technology.

The institute cultivates natural and exact sciences, and develops technologies to resolve local, regional and national scientific issues. Research at IPICYT covers such areas as molecular biology, advanced materials, applied mathematics, environmental sciences and applied geosciences. From an IT perspective, the institute's work relies heavily on high-performance computing (HPC).

The challenge

Ricardo Femat is IPICYT's general director. "We are always looking ahead at the benefits of future technologies," said Femat. "For this upgrade, our sights were set on the highest performing HPC server available within our budget — up and running as quickly as possible."

The diverse needs of IPICYT presented an additional challenge for HPC system engineering to balance the memory, interconnect and processor performance across the spectrum of HPC applications.

IPICYT approached Atos, a leading global IT provider, in June 2017 with its requirements. Atos responded with a proposal based on the new Intel® Xeon CPU codenamed "Skylake," which has been recently released, and one InfiniBand EDR interconnect. Thanks to an early delivery, the system will be up and running in September.

"This aggressive timeline is possible because of Atos' strong experience in delivering high-end HPC solutions integrating the latest releases of our close partners such as Intel and Mellanox," said Paul Maya, CEO of Atos Mexico.

The solution

The HPC solution consists of 82 compute nodes integrating two Intel Skylake Xeon Gold 6130 (2.1GHz, 16c, 22MB 125W) CPUs, interconnected through Mellanox EDR InfiniBand, and up to three 3.5" or six 2.5" drives for optimal performance.

With Intel Advanced Vector Extensions (AVX-512), the new processors have a set of instructions that double the floating-point performance and improve overall performance by 30%. AVX-512 are intended specifically for big data workloads in scientific simulations, financial analytics, artificial intelligence (AI)/deep learning, 3-D modeling and analysis, image and audio/video processing, cryptography and data compression.

The solution is managed with Bull Super Compute Suite (SCS) 5 for highly secure, extreme computing management and end-environment efficiency. SCS 5 is based on best-of-breed, open-source and independent software components that can be added to or swapped out with default components.

"Partnerships and research are the heart of Atos culture. We invest heavily in both – and in this instance they gave us the ability to deliver the perfect solution for IPICYT," said Maya.

The results

The new HPC server will be operational in September 2017, making IPICYT one of the **world's first users of the Skylake Xeon processor.**

Industry and scientific partnerships

Next for IPICYT is a roadshow to demonstrate its capabilities to launch new research projects to industry leaders in Central Mexico. "We receive many inquiries from the Bajio industrial corridor," said Femat. "Stronger HPC capabilities have made our work in advanced materials and design that much more appealing to the Mexican automotive industry, as one example," he explained.

Femat and Maya see opportunities for future collaboration particularly with Atos automotive clients in this region, which produces 3.5 million automobiles annually. "We are all thrilled by the innovations that IPICYT and Atos together can bring to not only the automotive industry but also to the broader manufacturing industry," said Maya.

Why Atos for HPC

Atos is committed to developing innovative HPC systems and solutions to solve the major challenges of the 21st century. Beyond Bull system design and delivery, Atos offers complete professional services to design, install, operate, manage and continuously improve HPC infrastructures. ATOS is also a leader in quantum computing research with its recent launch of the Quantum Learning Machine (QLM), the highest performing quantum simulator available today.

More information

Learn more about high-performance computing from **atos.net** or email **info.na@atos.net**.

Learn more about IPICYT research and activities at **ipicyt.edu.mx**.