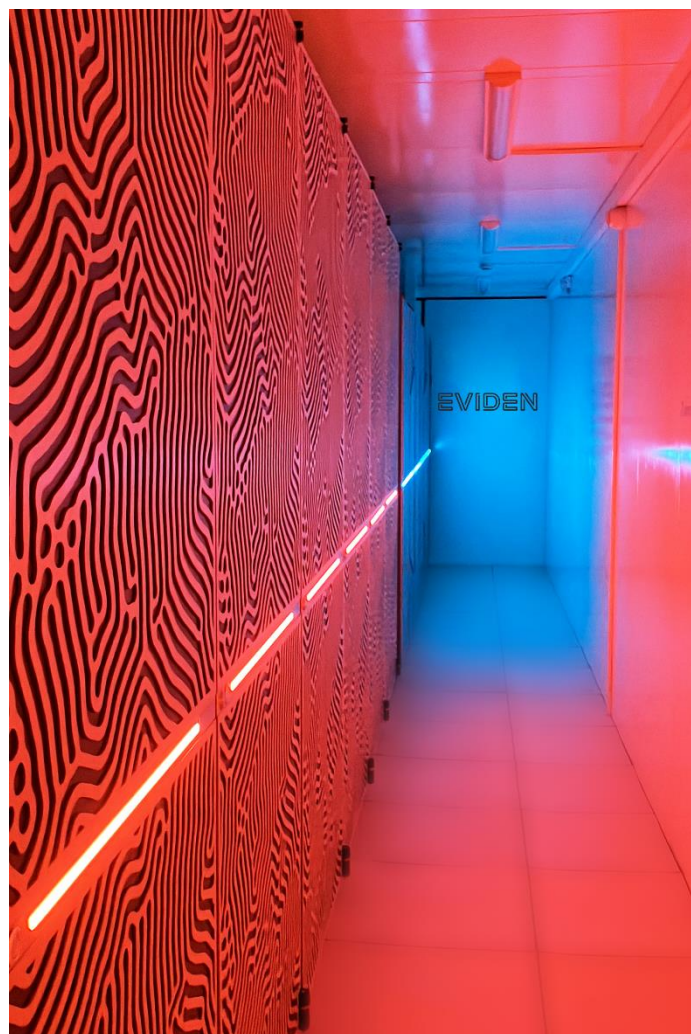


EVIDEN



Santos Dumont, LNCC supercomputer, receives fourfold upgrade as the first step in the Brazilian Artificial Intelligence Plan

The upgraded supercomputer, built by Eviden and based on leading technologies from NVIDIA, Intel and AMD, is the step towards transforming it into one of the largest supercomputer in the world



Built by Eviden (Atos Group), a technology leader for sustainable advanced computing and AI infrastructures, and integrating NVIDIA Enterprise technology, a pioneer in accelerated computing and artificial intelligence, this upgrade of the supercomputer is part of the Federal Government's first investment step towards the Brazilian Artificial Intelligence Plan. The Brazilian Artificial Intelligence Plan (PBIA) 2024-2028, launched during the 5th National Conference on



Science, Technology and Innovation, has a planned investment of R\$23 billion over four years to transform Brazil into a world reference in innovation and efficiency in the use of AI.

The Brazilian Artificial Intelligence Plan is a Federal Government project that is focused on ensuring sovereignty in technology focused on AI, making Brazil a globally recognized competitive hub.

“This new upgrade of Santos Dumont aims to increase its processing capacity, allowing greater robustness in calculations intended for research, especially using artificial intelligence”, explains Fábio Borges, president of LNCC.

Led and integrated by Eviden, this second upgrade relies on its BullSequana XH3000 architecture, a scalable technology – designed and manufactured in its flagship factory in France – that has enabled a fourfold expansion in the supercomputer’s capacity, including additional AI-dedicated capabilities. It will perform 18.85 petaflops or quadrillion operations per second, an increase of approximately 575% compared to the original 2015 specification.

Relying on Eviden’s long-lasting expertise in providing the most eco-efficient technologies, the supercomputer also integrates its patented high-efficiency Direct Liquid Cooling (DLC) system, able to achieve five times the density of traditional air-cooled systems, therefore ensuring greater energy efficiency. This technology uses water at room temperature to cool the system, with an inlet water in the range of 26°C to 30°C and an outlet water at 36°C to 39°C, which can capture over 98.5% of the heat from power supplies, processors, accelerators, network devices, disks and memory, a major improvement in energy efficiency compared to the initial 2015 version, which dissipate only 80% of the heat on water.

“Computing and AI technologies are the cornerstone of any scientific and innovation breakthroughs, enabling researchers to tackle humanity’s biggest challenges. Leading and supporting this new extension is a tremendous pride for the Eviden team giving LNCC’s researchers more computing power, and additional AI-dedicated capabilities while continuously improving the energy efficiency of the supercomputer. With our decade-long collaboration with LNCC, taking part in the Brazilian Artificial Intelligence Plan is another proof of Eviden’s commitment to the Franco-Brazilian cooperation and a reminder of the Group’s leading position in the country.” comments Luis Casuscelli, Head of HPC in South America for Eviden, Atos Group.

The Santos Dumont upgrade is composed of 5 different partitions. The largest one includes 62 BullSequana XH3145-H blades, each blade equipped with 4th Gen Intel® Xeon® Scalable Processors and 4 NVLINK connected NVIDIA H100 GPUs. The second largest partition is based on 20 BullSequana XH3420 blades, 60 nodes, each node equipped with 2 AMD EPYC™ 9684X processors. The third partition consists of 36 BullSequana XH3515-H blades equipped with 4 NVLINK connected NVIDIA Grace Hopper Superchips. The fourth partition includes 6 blades, 18 nodes, equipped with 2 AMD Instinct™ MI300A APUs in each node. Moreover, there are 4 nodes equipped with the newest CPU NVIDIA Grace Superchip. All the nodes are interconnected by an NVIDIA Infiniband NDR non-blocking fabric running at 400Gbps.



Based on NVIDIA's Enterprise solution, Santos Dumont now has four Grace CPUs connected to four Hoppers GPUs on each accelerated on the BullSequana XH3515-H blades, technology designed to process large volumes of data in dynamic data centers, producing intelligence with maximum energy efficiency, essential for AI work. The Grace CPU offers twice the performance per watt, twice the packaging density and the highest memory bandwidth compared to the current leading servers.

Almost all the processing nodes are installed on six BullSequana XH3000 racks which cover slightly more than 7 square meters and deliver up to 147 per rack for the computing blades and high-speed network switches. 98.5% of the heat generated inside these racks is captured and removed from the datacenter by the Eviden's most efficient DLC system available in the market today.

"With each new upgrade, processing capacity increases, research horizons expand, and the supercomputer also becomes smaller and more efficient, ensuring lower energy consumption. This is an important trend for AI development, since this is a technology that demands a lot of energy. The more efficient it is, the more it can be expanded while ensuring sustainability," says Marcio Aguiar, director of NVIDIA's Enterprise division for Latin America. "It is an honor for NVIDIA to be part of this historic moment for technological development and innovation in Brazil. We will continue to partner with LNCC, Eviden, Petrobras and the Federal Government in each update of Santos Dumont and throughout the project that aims to develop state-of-the-art national AIs," adds Aguiar

Located in Petrópolis, Rio de Janeiro, the supercomputer has already been used in thousands of research projects led by Brazilian researchers – such as Dr. Ana Teresa Vasconcelos who sequenced the COVID-19 genome on it in 2020 – and can be requested for use by any national researcher or institution.

The supercomputer is a project developed at the National Laboratory for Scientific Computing (LNCC), a Research Unit of the Ministry of Science, Technology, Innovations and Communications – MCTIC, dedicated to conducting research in Scientific Computing methods with applications in different areas of knowledge. Santos Dumont was built with support from Petrobras, which continues to support the upgrade project.

About Eviden

[Eviden](#) is the Atos Group brand for hardware and software products with c. € 1 billion in revenue, operating in 36 countries and comprising four business units: advanced computing, cybersecurity products, mission-critical systems and vision AI. As a next-generation technology leader, Eviden offers a unique combination of hardware and software technologies for businesses, public sector and defense organizations and research institutions, helping them to create value out of their data. Bringing together 4,200 world-class talents and holding more than 2,100 patents, Eviden provides a strong portfolio of innovative and eco-efficient solutions in AI, computing, security, data and applications.



About NVIDIA

Since its founding in 1993, NVIDIA (NASDAQ: NVDA) has been a pioneer in accelerated computing. The company's invention of the GPU in 1999 spurred the growth of the PC gaming market, redefined graphics computing, initiated the era of modern AI, and has aided industrial digitalization across all markets. NVIDIA is now a full-stack computing infrastructure company with data center-scale solutions that are revolutionizing the industry.

About LNCC

The LNCC is a Research Unit of the Ministry of Science, Technology, Innovations, and Communications – MCTIC, conducting research in Scientific Computing methods with applications in various fields of knowledge. It serves as the National Center for Supercomputing and coordinates the SINAPAD – National High-Performance Computing System. It also has an interdisciplinary Graduate Program with the highest rating (Concept 7) in the CAPES evaluation, training master's and doctoral students in Computational Modeling.

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