Press release

Adastra: a new French supercomputer on the road to Exascale

Paris, 15th November 2021

GENCI, the French national agency for High Performance Computing and CINES, the National Computing Center for Higher Education (one of the 3 French national centers), together with Hewlett Packard Enterprise (HPE) and AMD, are proud to unveil the acquisition of “Adastra” supercomputer and its upcoming deployment during next spring.

At 2022 horizon, Adastra will be one of the most powerful supercomputers for academic and industrial open research in Europe, thanks to its state-of-the-art architecture, which will complement GENCI’ systems already available at the two other national computing centers (TGCC for the CEA and IDRIS for the CNRS-INS2I).

This new leading-edge system “Adastra” takes its name from the Latin sentence “*Per aspera ad astra*” meaning “Through hardships to the stars”. Adastra will indeed provide scientists with innovative and large-scale computing capabilities on the difficult paths of research with more than 70 PFlops/s, more than twenty times computing power of the current system in production at CINES. This will strengthen the position and the means of French research on the exciting path to Exascale.

GENCI has selected the HPE offer based on the HPE Cray EX system after an open competitive dialog which happened during the pandemic period, for 18 months. The selection has been based on a TCO approach, relying both on sustained performance and optimized energy consumption for full-fledged scientific and industrial applications representative of a typical production workload and an innovative process of integrated collaboration called "contract of progress", starting for 2 years in November, earlier than the delivery of the system.

Thereby, Adastra will be based on a balanced and modular converged architecture with 2 complementary compute partitions, to answer the various needs of hundreds of daily users:

- Partition 1 has manycore scalar nodes, each one based on next generation AMD EPYC™ processors, codenamed “Genoa” with 768 GB of DDR5 memory and one 200 Gbps Slingshot 11 NIC
- Partition 2 has hybrid nodes, each one with an optimized 3rd Gen AMD EPYC™ CPU with 256GB of DDR4 memory and four AMD Instinct™ MI250X OAM accelerators, each

with 128 GB HBM2e, for a total of 512 GB GPU memory, and four 200 Gbps Slingshot 11 NICs

The accelerated partition (GPU) is scheduled to be commissioned in the spring of 2022 while the scalar (CPU) partition is planned to be commissioned end of 2022.

The whole system, federated by HPE Slingshot, a high performance Ethernet fabric designed for HPC and AI solutions, will access a two-level Cray ClusterStor E1000 Lustre parallel file system from HPE providing close to 2PB with a throughput of 1.3 TB/s based on the level 1 full-flash scratch and a second level based on 24 PB @ 250 GB/s based on fast rotative disks.

In the goal of optimizing global energy consumption, the solution provided by HPE is among one of the most efficient by cooling 97% of the heat generated by its machine through warm water liquid cooling associated with a PUE of 1.10 leading to a maximal sustained consumption of 1.59 MW.

Finally, as part of the contract, HPE and AMD are engaged with CINES and end users' communities in a 2-years contract of progress toward jointly porting, optimizing and scaling out HPC and AI applications on the accelerated partition of Adastra. These activities will leverage the AMD ROCm™ open software platform using the HIP and OpenMP® programming models, compiler toolchain and analysis tools, thus participating in the French global effort toward Exascale-enabling of scientific and industrial applications.

"*Adastra will allow French research teams to position themselves even more strongly on the path to exascale, and to prepare for the change associated with extremely large-scale resources and new technologies/services. The realization of this major step came from the dialogue and the expertise of CINES, GENCI and HPE teams*." said Philippe Lavocat, Chairman and CEO of GENCI.

"This new Adastra supercomputer is a double challenging for CINES: massively switch users to boosting GPU while overcoming the electrical consumption. The 21x jump in computing power is dizzying compared to the current machine, while power consumption only grows by 1.5x for green HPC. The GPU support provided by AMD, using the HPE Cray EX system, allowing Adastra to ramp up, is the key element that will ensure the success takeoff of researchers to the stars!" said Boris Dintrans, Director of CINES. For the Conférence des Présidents d'Universités (CPU), "*it marks an important step in the digital strategy of french universities, both in its research component by making available this next-generation supercomputer for state-of-the-art simulations, and also to guide and support students towards HPC in terms of training*" said Guillaume Gellé, vice-president of CPU.

"We are honored to have been selected by GENCI, which empowers some of the world's leading research centers, to deliver advanced high performance computing (HPC) and AI solutions using exascale-era technologies in support of propelling France's R&D efforts," said Justin Hotard, senior vice president and general manager, HPC and AI, at HPE. "The design of the Adastra supercomputer is a result of a close collaboration between GENCI, CINES, HPE and AMD to deliver a specialized, high-performing system to harness larger data sets, including optimizing AI and machine learning needs, to accelerate discovery and innovation at a faster rate."

"AMD EPYC processors and Instinct Accelerators are becoming the HPC industry's choice when performance, scale and capabilities are needed for the demanding HPC workloads that aim to solve some of the world's most pressing issues. We are proud to be working with CINES, GENCI and HPE on the Adastra supercomputer as we draw closer to the exascale era in Europe." said Roger Benson, Senior Director, Commercial EMEA at AMD

About GENCI

Created by the French government in 2007, GENCI is a large-scale Research Infrastructure, public operator organization that aims to democratize the use of digital simulation through high-performance computing combined with artificial intelligence, to support French scientific and industrial competitiveness.

GENCI has three missions:

- To implement the national strategy aiming at equipping French scientific open research with high-performance computing, storage and massive data processing resources associated with AI technologies, in conjunction with the three national computing centers;
- To support the creation of an integrated HPC ecosystem on a national and European scale;
- To promote digital simulation and HPC to academic research and industry.

GENCI is a civil company owned 49% by the French government, represented by the Ministry of Higher Education and Research, 20% by the CEA, 20% by the CNRS, 10% by the universities represented by the Conference of University Presidents and 1% by Inria.

https://www.genci.fr/en

About CINES

CINES (Centre Informatique National de l'Enseignement Supérieur) is a national HPC center located in Montpellier and attached to the French universities and higher education and research institutions. On behalf the CPU, it hosts and operates GENCI's Adastra supercomputer with dedicated HPC teams. In addition to HPC, CINES is also the national digital archiving center for research and hosts the IT resources of fifteen institutions through its label of national datacentre. https://www.cines.fr/en

About Hewlett Packard Enterprise

Hewlett Packard Enterprise (NYSE: HPE) is the global edge-to-cloud company that helps organizations accelerate outcomes by unlocking value from all of their data, everywhere. Built on decades of reimagining the future and innovating to advance the way people live and work, HPE delivers unique, open and intelligent technology solutions delivered as a service – spanning Compute, Storage, Software, Intelligent Edge, High Performance Computing and Mission Critical Solutions – with a consistent experience across all clouds and edges, designed to help customers develop new business models, engage in new ways, and increase operational performance. For more information, visit: www.hpe.com

About AMD

For more than 50 years AMD has driven innovation in high-performance computing, graphics and visualization technologies — the building blocks for gaming, immersive platforms and the data center. Hundreds of millions of consumers, leading Fortune 500 businesses and cutting-edge scientific research facilities around the world rely on AMD technology daily to improve how they live, work and play. AMD employees around the world are focused on building great products that push the boundaries of what is possible. For more information about how AMD is enabling today and inspiring tomorrow, visit the AMD (NASDAQ: AMD) website, Facebook, LinkedIn and Twitter pages.

Contacts

GENCI - Nicolas Belot - nicolas.belot@genci.fr - +33(0)760999510 I www.genci.fr
CINES – Boris Dintrans – boris.dintrans@cines.fr - +33(0)608726280 | www.cines.fr