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PRESS RELEASE

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"Alps": towards a geographically redundant supercomputing research infrastructure

To enhance the capability and availability of its research infrastructure, the Swiss National Supercomputing Centre of ETH Zurich is collaborating with EPFL to extend its new extreme-scale computing and data infrastructure dubbed "Alps" to the campus of EPFL.

As part of the "Alps" research infrastructure, the Swiss National Supercomputing Centre (CSCS) in Lugano is currently deploying hardware and software at various locations within Switzerland. This distributed "Alps" infrastructure will increase the efficiency and resilience of the services CSCS provides.

The current extension of "Alps" to the EPFL campus in Lausanne will be available as failover for the Federal Office of Meteorology and Climatology MeteoSwiss service in spring 2024. This innovation is arising from CSCS's work on the "Alps" infrastructure and is made possible by a collaboration with EPFL for the housing of the necessary equipment within EPFL's on-campus data centre. The extension also opens new avenues for processing federated data, as is often the case in medical research. "We are thrilled to host this visionary infrastructure, and especially about this timely collaboration with CSCS and ETH Zurich. We look forward to intensifying it and to the multiple benefits that will derive for EPFL and Switzerland," says Anna Fontcuberta i Morral, Associate Vice President for Centers and Platforms of EPFL.

Ensuring the reliability of high-availability services
The "Alps" infrastructure that is distributed over multiple geographical locations, will enhance the reliability of high-availability services such as the numerical weather forecasts for MeteoSwiss, which are currently computed only at the CSCS facility in Lugano. This setup is particularly important to mitigate the risks associated with power outages, such as potential regional blackouts as part of Switzerland's energy contingency plans.

According to the Swiss Confederation's OSTRAL programme, in the event of an energy shortage, a scenario may arise in which CSCS has to reduce the load or even shut down most of its systems temporarily. With the current developments, critical services such as MeteoSwiss can be quickly brought online at a different geographical location within the distributed infrastructure – EPFL in particular – that are not themselves affected at the same time by an OSTRAL blackout. This geo-redundant setup guarantees uninterrupted operations and minimises downtime.

"The research infrastructure with its ability to support high-availability services over different geographical locations is one of the innovations that resulted from the careful design and planning of the 'Alps' system architecture," emphasises Thomas Schulthess, Director of CSCS. This includes an approach that is based on cloud-native technologies and is intended to ensure that researchers can optimally use the new computing and data infrastructure. For this purpose, CSCS developed an environment dubbed "versatile software-defined clusters" (vClusters). These

vClusters are partitions in the “Alps” infrastructure that are specifically tailored to the needs of different research institutions or research domains.

Christian Wolfrum, Vice President for Research at ETH Zurich is pleased that, following the recent announcement of the Swiss AI Initiative by ETH Zurich and EPFL, another innovative collaboration in the field of scientific computing has now materialised with CSCS: “With this latest collaboration, ETH Zurich with CSCS and EPFL are driving the digital transformation of society. I am excited to see this distributed environment serve both, world-class research and critical services for our country.”

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