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New high performance computer to researchers in Norway

UNINETT Sigma2 AS has signed a contract with SERIT IT Partner with LENOVO as a supplier, to acquire a new high performance computer (HPC). The supercomputer will be installed at UiT The Arctic University of Norway by the end of 2016 and will be available to researchers in April 2017.

Why new supercomputer?

Modern research generates large amounts of data and require very large calculation and storage capacities. It is important for Norwegian researchers to have access to electronic infrastructure at a high international level in order to be competitive, and a number of research groups will benefit greatly from the computational power of the new system. High performance computers are of particular importance for research that requires extensive calculations, such as bioinformatics, materials science, medicine, chemistry, physics, climate research, energy research, astrophysics and linguistics.

The current the national e-infrastructure for research and higher education consists of four computing facilities, physically located at the universities in Oslo, Bergen, Trondheim and Tromsø. This new facility replaces the existing two sites, respectively Hexagon in Bergen and Vilje in Trondheim. The other two systems are expected to be replaced with a new national computing facility in 2018.

Environmentally friendly

An important aspect of this installation is heat recovery. The new supercomputer is able to recover most of the energy used for calculations as hot water that can be utilized for heating the buildings at the university campus in Tromsø. All the electricity used for this machine comes from hydro-electric power plants.

The new supercomputer / technical specifications

The new supercomputer has a computing capacity totalling approximately 260 million CPU hours annually with 1.1 petaflops per second maximum theoretical performance. The life expectancy of the new machine is four years, until 2021.

Main components:

- 948 Lenovo Next Scale nx360 water-cooled servers.
- 1896 Intel 16-core 2.10 GHz E5-2683v4 processors.
- 16 NVIDIA K80 accelerators.
- 100 Gbps Mellanox EDR high-speed network.
- 2.45 petabytes DataDirect Network SFA14KE central Lustre-based storage system.

Key figures (approx):

- Processor Cores: 30,000.
- Internal Memory: 70 terabytes.
- Internal disk: 150 terabytes.
- Central disk: 2.45 petabytes.
- Theoretical Performance (Rpeak): 1.1 petaflop/s.
- Annual theoretical energy capture: 2.5 million KWh. (290 kW x 24 x365)
- Dimensions: 18 cabins (10 meters).

About UNINETT Sigma2

UNINETT Sigma2 is responsible for acquiring, operating and developing the national e-infrastructure for computational science in Norway, and offers services in supercomputing and data storage.

In close collaboration with the University of Oslo, University of Bergen, UiT The Arctic University of Norway and NTNU, UNINETT Sigma2 offers an attractive and sustainable e-infrastructure and e-infrastructure services to research and higher education in Norway.

Annual costs of investment and operation of national e-infrastructure are on average 100 million to 120 million NOK and are financed by the Norwegian Research Council and the four universities.

UNINETT Sigma2 leads and coordinates the Norwegian participation in international cooperation within the e-infrastructure.

Serit IT Partner Tromsø

Serit IT Partner Tromsø is a leading northern Norwegian supplier of technology and IT services company located in Tromsø and Trondheim. The company is part of the nation's largest IT chain; Serit and the delivery of the largest supercomputer is made through the company's branch in Trondheim, Serit Nidaros, which was established at the turn of 2015/16. The company has long experience with servers and data center technology, and was responsible for the delivery of Norway's first teraflop system to UiT in 2004.

Lenovo

Lenovo is a Chinese owned Fortune 500 company that delivers innovative technology solutions to businesses and consumer markets including servers, personal computers, smart phones and tablets. Lenovo is the world leader in energy recovery technology for the computer room and has delivered several similar installations as the one to be installed in Tromsø. Among others, Europe's 7th largest supercomputer "SuperMUC" at LRZ in Munich (Germany) and Europe's 11th largest "Marconi" by CINECA in Bologna (Italy)

Contact:

For more information please refer to

Gunnar Boe, Managing Director UNINETT Sigma2, tel.: 911 87 850

www.sigma2.no