

Abisko launched: Meeting the demands of future research

31:st of May 2012

At May 31:st, the High Performance Computing Center North (HPC2N) in Umeå, Sweden will unveil its new supercomputing system: Abisko. Based on AMD Opteron 6238 processors and named after the national park area in Swedish Lapland, Abisko represents one of the largest computing clusters in Europe. The system is provisioned with 15264 processor cores and 44 terabytes of memory in total. Throughout the implementation process, HPC2N worked very closely with the Swedish server manufacturer South Pole and processor manufacturer AMD. The delivery was finalized during the first quarter and the cluster has already been taken into service.



Åke Sandgren & Bo Kågström, HPC2N

Maximum capacity under the casing

Abisko consists of 318 nodes making for 15264 processor cores in total. Each node is equipped with 4 AMD Opteron 6238 12-core 2.6 GHz processors. There are 10 'fat' nodes with 512 gigabytes of memory each, as well as 308 'thin' nodes with 128

gigabytes of memory each. Each 'fat' node has 1 terabyte of local storage; thin nodes have 500 gigabytes. All servers are

connected via a fast 40 gigabit/s Infiniband network from Mellanox. Abisko has a theoretical peak performance of 158.75 teraflops/s. Abisko runs Ubuntu Linux. South Pole has built all the servers in Solna and then installed the cluster on site at HPC2N in Umeå. The system occupies ten racks and, aside from compute nodes, contains networking products connected with over 1500 cables of different types.

“A cluster that has nodes with 48 processor cores and up to 512 gigabytes of memory is a unique solution, and nothing similar has ever been delivered to Sweden. We are very proud that HPC2N has chosen us as their supplier and this order has contributed to our doubled turnover in 2011.”, says Jakob Sandgren, CEO South Pole.

“The latest AMD technology with several energy-efficient processor cores and large memory capacity per node makes the system unique and provides the researchers with a great flexibility to accomplish many different computations and simulations.”, says professor Bo Kågström, HPC2N Director.

Strategic cooperation for science

There is a strategic cooperation between HPC2N and Uppmax (Uppsala), Lunarc (Lund) and C3SE (Chalmers) working with the Abisko resource. The cooperation also entails distributed user support

infrastructure hosted by HPC2N in collaboration with C3SE, Lunarc and Uppmax.

The main financier, SNIC (Swedish National Infrastructure for Computing) is the Swedish Research Council's metacenter including six HPC centers in Sweden. HPC2N director Bo Kågström is glad and proud of the new capacity and the possibilities it offers, not only for research at HPC2N but also for computational science research all over the country.

A resource for both scientists and industrial collaboration

Abisko is already in production use and is used for computation and simulation in several areas of research, including space, material, and life sciences as well as several industrial engineering applications. Furthermore Abisko is also an important resource in research for developing fast and efficient (and therefore greener) parallel algorithms and software libraries. Abisko is also used in computing science education and in several engineering programs and it is also a resource for cooperation with industry and society.

“In cooperation with South Pole, AMD was able to deliver a solution matching the customer needs for a High Performance Computing (HPC) platform. One of the strengths of the AMD Opteron technology is the high core density and the ability to run complex HPC applications with fewer nodes and less power. HPC Customers generally strive to maximize the computation capabilities of their clusters within fixed limits of budget, space, and energy consumption and we were able to offer a compelling HPC platform to the HPC2N.”, says Leif Nordlund, HPC & Cloud Business Development Executive, AMD

Customer perspective, professor Bo Kågström, HPC2N Director.

How much have you increased your capacity by this purchase?

It is a tripling of the computing capacity compared with earlier. Abisko is so far the largest investment in both economic terms as well with respect to the total system performance and memory capacity.

Why is it important to be in the front-line of the technology?

HPC2N is of course more attractive to our users and also our own research in parallel algorithm and software design gets more impact when we develop in pace with the technology evolution. For all researchers, it gives the possibility to study even more complex and large-scale computational problems in various fields.

How did the choice of vendors take place?

The choice was done after an open EC procurement where the vendors' tenders were evaluated following given criteria in our specification of requirements. Important criteria were energy-efficiency and cost-efficiency put in relation to the total system performance and capacity.

More information:

Tech description of the Abisko compute node CPU architecture

<http://www.hpc2n.umu.se/resources/abisko/cpuarch>

Information about HPC2N:

High Performance Computing Center North (HPC2N) is a national center for Scientific and Parallel

Computing. It is a collaboration between universities and research institutes that forms a competence network for high performance and parallel computing, grid and cloud computing, scientific visualization and virtual reality, as well as effective mass-storage solutions, in Northern Sweden. One objective of the center is to raise the national level of competence in HPC and to transfer HPC knowledge and technology to new users in academia and industry. The partners of HPC2N are: Umeå University, Luleå University of Technology, The Swedish Institute of Space Physics (IRF) in Kiruna, Swedish University of Agricultural Sciences (SLU) and the Mid-Sweden University. For more information, visit <http://www.hpc2n.se>.

Information about South Pole

South Pole was founded by Jakob Sandgren 1999 with the business idea of helping customers to save money by using Linux. The company also works with server solutions and consulting, where focus is on embedded systems and hardware programming in Linux environment. The company has also delivered cluster solutions since 2001 and in the beginning of 2011 South Pole delivered the most powerful computer in Sweden, a Cray XE6 with a total of 36000 processor cores. For more information, visit <http://www.southpole.com>.

Information about AMD

AMD is a semiconductor design innovator leading the next era of vivid digital experiences with its groundbreaking AMD Accelerated Processing Units (APUs) that power a wide range of computing devices. AMD's server computing products are focused on driving industry-leading cloud computing and virtualization environments. AMD's superior graphics technologies are found in a variety of solutions ranging from game consoles, PCs to supercomputers. For more information, visit <http://www.amd.com>.

Contact information

HPC2N Bo Kågström +46 (0)73 - 620 54 19, bokg@cs.umu.se

South Pole AB Jakob Sandgren +46 (0)707 30 05 41, jakob@southpole.se

AMD Leif Nordlund +46 (0)73 625 40 61, leif.nordlund@amd.com

More information, links and images that can be used available on:

<http://www.southpole.se/press>

