HPC2N – in summary

The primary 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.

Today, the use of HPC includes compute-intensive as well as data- and communication-intensive applications.

HPC2N is one of six national centers funded by the Swedish National Infrastructure for Computing (SNIC), a metacenter under The Swedish Research Council.

HPC2N partner coordinators:

IRF_contact@hpc2n.umu.se
LTU_contact@hpc2n.umu.se
MIUN_contact@hpc2n.umu.se
SLU_contact@hpc2n.umu.se
UMU_contact@hpc2n.umu.se

Our partners:

IRF
Luleå University of Technology
SLU
Mittuniversitetet Mid Sweden University
Umeå University

Welcome to contact us!

Email: info@hpc2n.umu.se

Phone: +46 (0)90-786 76 66

Web: www.hpc2n.umu.se

LinkedIn:

https://se.linkedin.com/company/hpc2n

YouTube:

https://www.youtube.com/user/HPC2N/

HPC2N

HIGH PERFORMANCE COMPUTING CENTER NORTH

HPC2N

HIGH PERFORMANCE COMPUTING CENTER NORTH

A national center with first-class resources and expertise:

- **Scalable and parallel high performance computing**
- **Large-scale storage facilities**
- **Grid and cloud computing**
- **Software and advanced support for e-Science applications**
- **International network for research and development**

HPC2N is mainly funded by: SNIC

HPC2N at a glance

Provides state-of-the-art resources and expertise:

- Scalable and parallel HPC
- Large-scale storage facilities (Project storage, WLCG storage (dCache), Tape)
- Grid and cloud computing (WLCG NT1, SNIC Cloud)
- Support
  - Primary, advanced, dedicated
  - Application Experts (AEs)
- Access to site-installed software, applications, compilers
- International network for research and development
  - PRACE, EISCAT, eSSENCE, NDGF, WLCG, SNIC Science Cloud, . . .

Prominent node of the national e-Infrastructure and the metacenter SNIC

HPC2N – High Performance Computing Center North: A national e-Science center and prominent part of the Swedish National Infrastructure for Computing (SNIC), a distributed metacenter under the Swedish Research Council. HPC2N is organized as a consortium between universities and research institutes that form **a competence network for scalable high performance and parallel computing**, grid and cloud computing, effective large-scale storage solutions as well as e-Science applications.

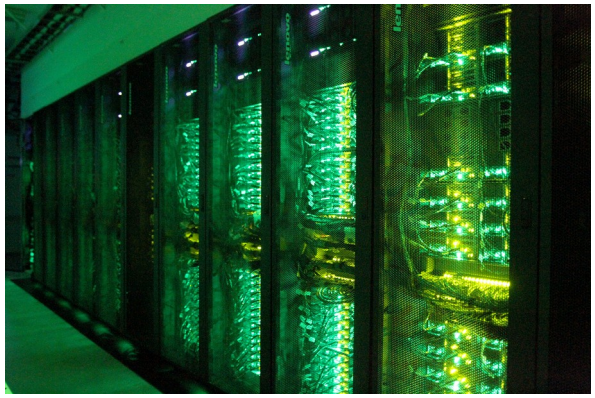
Services and resources @ HPC2N

HPC2N provides a wide spectrum of services ranging from internationally competitive Tier-1-type HPC resources and e-Infrastructure to education and user training programs reflecting HPC2N's **strong commitment to national and local HPC users** as well as new users in emerging areas.

We have site-installations of a wide range of scientific software, applications, libraries, and compilers.

Our system- and application experts provide primary, advanced, as well as dedicated support to our users.

We offer training on a wide range of subjects, including introductions to using our systems, MPI and OpenMP programming, Git, using various molecular dynamics applications, Performance modelling, R, Python, ...



Kebnekaise

The main HPC2N computing resource was deployed in the summer of 2016 and extended with new Skylake and V100 nodes during 2018. It has 19288 cores (of which 2448 are KNL-cores) with a peak performance of 984 Tflops/s. For scalable parallel performance, the system is equipped with high bandwidth, low latency FDR/EDR InfiniBand interconnects.

Kebnekaise is a highly heterogeneous system, consisting of

- Intel Xeon E5-2690v4 (Broadwell) nodes with 48 cores each and 128 GB/node memory
- Intel Xeon Gold 6132 (Skylake) nodes with 48 cores each and 192 GB/node memory
- Intel Xeon E7-8860v4 (Broadwell) nodes with 72 cores and 3072 GB/node memory
- Intel Xeon E5-2690v4 nodes with Nvidia K80 GPUs (4 or 2 per node)
- Intel Xeon Gold 6132 nodes with Nvidia V100 GPUs
- Intel Xeon Phi 7250 (Knight's Landing) with 68 cores each, 192 GB RAM per node and 16 GB MCDRAM per node

R&D activities @ HPC2N

HPC2N participates in several international e-Infrastructure projects including NDGF, PRACE, WLCG, and SNIC Science Cloud.

In close cooperation with the department of Computing Science and as partner of the eSSENCE programme, HPC2N actively participates in several international R&D projects. The HPC and parallel computing research focuses on effective and thereby greener algorithms and software libraries that handle memory hierarchies, many-multicore and parallel architectures efficiently.

HPC2N has long been involved in several PRACE projects, most recently contributing with expertise on accelerators and in optimization.

Another active area is interactive simulation methods for visual simulations in educational environments for vehicle simulators in cooperation with Algoryx (HPC2N spin-off).

The research topics in grid and cloud computing include generic tools for grid infrastructures, elastic virtual data center technology for federated clouds, and grid applications.

HPC2N – the collaboration

We are a **collaboration between universities and research institutes** who form a competence network for high performance and parallel computing, grid and cloud computing, scientific visualization and virtual reality (VR), as well as effective mass-storage solutions, in Northern Sweden.

Our partners are

- IRF - The Swedish Institute of Space Physics
- LTU - Luleå University of Technology
- Mittuniversitetet / Mid Sweden University
- SLU - the Swedish University of Agricultural Sciences
- Umeå University

Each HPC2N partner has a part-time coordinator responsible for local activities. The HPC2N partner coordinators also identify and give support for new projects and HPC2N users.