INNOVATIVE ICT FOR SCIENCE AND INDUSTRY

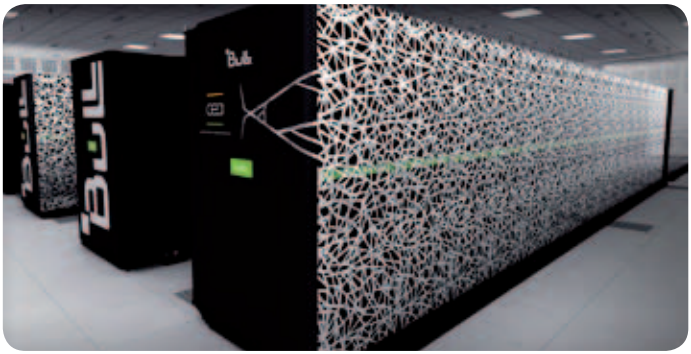
WHAT SURF SARA CAN DO FOR RESEARCH

INNOVATIVE ICT FOR SCIENCE AND INDUSTRY

Much of today's research requires high-quality ICT infrastructures. More and more researchers need computing power for complex models (such as climate models) or unstructured data sets containing billions of data points – not only at academic research institutes, but also at research departments of companies and in industrial settings. For all those researchers, SURFsara offers a comprehensive package of services and state-of-the-art technologies.

On 1 January 2013, SARA was incorporated into the SURF family and carries the new name SURFsara. Our activities are embedded in SURF, the leading organization for ICT innovations in higher education and scientific research. SURFsara supports Dutch research by offering services, expertise and systems in the fields of High Performance Computing, large-scale data storage, network technology, visualization and e-Science support.

HIGH PERFORMANCE COMPUTING



Large-scale computing power

Researchers are increasingly confronted with enormous amounts of data ('Big Data') that must be processed, stored and analyzed. In such research High Performance Computing (HPC) is an indispensable tool. For example, researchers can use the national supercomputer services provided by SURFsara. Our national supercomputer and the national compute cluster Lisa are fast and efficient tools enabling researchers to perform complex computations that are beyond the capacity of 'ordinary' computers.

We can offer a tailored program to guide researchers in optimizing and parallelizing the required software. Our consultants are from different scientific disciplines themselves and know exactly how to help researchers benefit optimally from our supercomputer and compute clusters.

DATA SERVICES

Numerous and complex data

Scientists frequently use complex measuring tools that generate huge amounts of data. Examples include the experiments with the Large Hadron Collidor at CERN and LOFAR, an astronomy research project using antennas. Research in life sciences also generates enormous data files (such as in DNA sequencing). The great challenge is to find ways of storing these PetaBytes of data in an efficient manner so as to make them easily accessible for use by researchers. To that end we have set up an infrastructure that combines very fast data connections with a wealth of storage space on tape or disk.

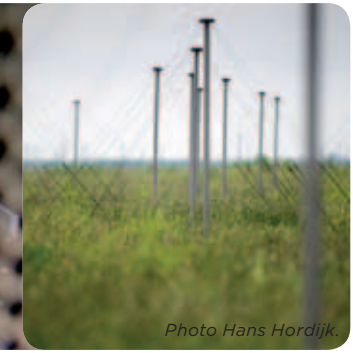


Photo Hans Hordijk

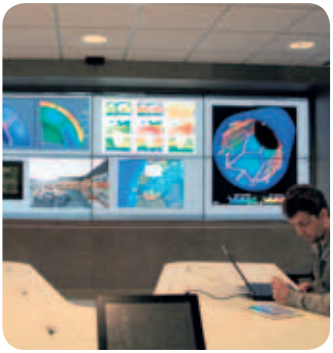
More and more data storage as well as analysis involve complex and/or unstructured data. For these types of data SURFsara also offers interesting infrastructures. The Hadoop cluster for instance, which can be used for the fast analysis of extremely big data sets. The spectrum of applications is very broad, typically including indexation, storage and search functions.

NETWORKING

At the speed of light

Fast network connections are vital. In this context, 'fast' really means as fast as the speed of light. SURFsara uses lightpaths via fiber-optics networks. Researchers can have their 'own' lightpath if they wish. A lightpath is a direct, safe and fast connection between two locations, such as two research institutions, enabling scientists to carry out their research more efficiently and set up structures for the remote sharing of facilities or large data files. At universities, researchers can use the infrastructure of the SURFnet network and NetherLight, SURFnet's open optical hub. Businesses too can profit from the fast network connections and direct access to infrastructure at SURFsara.

VISUALIZATION



The expressiveness of images

Visualization, both on-site and remote, has been a major focal area at SURFsara for years. Visualization helps to gain insight into large data sets, for example by highlighting connections that were before invisible. We have a high-tech visualization and presentation space for science and industry known as the Collaboratorium, which is equipped with facilities including a video wall of 4x2 Full HD screens with a multi-touch overlay, allowing the screen to serve as a giant smart tablet. The Collaboratorium also offers video conferencing facilities to promote interaction among researchers from all over the world. In the Collaboratorium, scientists from a very wide range of disciplines will find an ideal environment for the joint analysis of their data.

HPC CLOUD COMPUTING

On-demand and flexible

HPC Cloud Computing brings large-scale computing power to the individual researcher's desktop. The HPC Cloud is based around the key concepts of on-demand availability and high flexibility. Researchers can use the HPC Cloud from their own workstations using their own control systems and applications. This enables them to create a variety of virtual machines, upscale their applications and multiply their research. Researchers who work on several platforms can use the HPC Cloud to compile a hybrid cluster. For research issues on a truly grand scale SURFsara offers a Grid infrastructure.

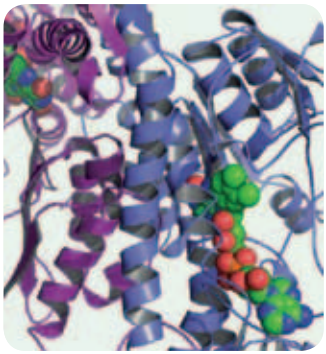
GRID COMPUTING

BiG Grid
the dutch e-science grid

Collaboration on high-end infrastructure

Grid computing allows researchers to share data and resources safely and efficiently. The Grid consists of a large number of data storage and computing facilities linked together via fast network connections. In this way, researchers from different universities and research centers can collaborate without having to leave their own workstations.
We manage an advanced e-Infrastructure, which includes the infrastructure of the former BiG Grid project. Our infrastructure is designed to meet researchers' needs.

e-SCIENCE SUPPORT



Access, support and development

We realize not every researcher is an ICT expert. This is why we offer targeted support services in using the e-Infrastructure. Our e-Science team is up to date with all major scientific disciplines. Because of the close cooperation between researchers and our advisors, we are familiar with the ICT-related problems and challenges researchers are facing. This enables us to keep lines of communication short and contribute directly to the creation of innovative solutions. The e-Science team can also be engaged to draw up research proposals and perform project management tasks.

SURFsara supports researchers in the Netherlands in intensive partnerships with industry and the academic community. We have more than forty years of experience in providing an integrated ICT research infrastructure and in offering expertise, services and support in the fields of High Performance Computing, data storage, visualization, Big Data, e-Science and Cloud Services.

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