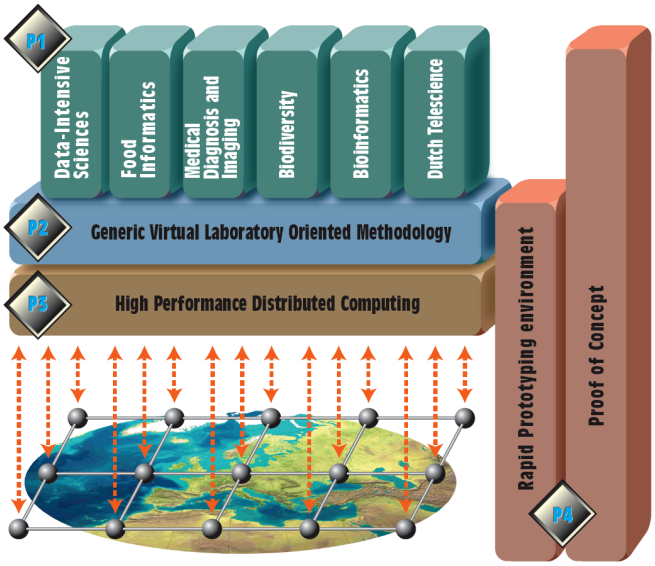
vl·e virtual laboratory for e·science

information

VL-e enables new approaches to traditional sciences

Information has become the fuel of our knowledge society, and our ability to digest, understand and share it will determine our scientific, economic and social progress.

The exceptional increase in computing power, storage capacity and network bandwidth over the past decades forms the basis of a digital revolution which has only just started. Also the changing scale and scope of experimental sciences require a new research paradigm: (digitally) enhanced science or e-Science. The aim of the 'Virtual Laboratory for e-Science' (VL-e) project is to bridge the gap between the technology push of the high performance networking plus the Grid and the application pull of a wide range of scientific experimental application domains. A typical example of this is the life sciences, where VL-e offers solutions for combining laboratory research with computational experiments and simulations, making use of the knowledge and experience gained from dealing with large data sets in high energy physics. At the same time, however, it is recognised that data sets in the life sciences are far more complex than in high energy physics.



More specifically, VL-e is developing a Proof-of-Concept (PoC) infrastructure (both hard- and software) to enhance location-independent access to scientific information and stimulate global and multidisciplinary collaboration, thereby enabling new approaches to traditional sciences. The VL-e software (both for rapid prototyping and in the PoC) provides generic functionalities that support a wide range of e-Science applications. This PoC infrastructure will boost the knowledge economy of the Netherlands.

Currently, six application domains are involved: Data-Intensive Sciences, Food Informatics, Medical Diagnosis & Imaging, Biodiversity, Bioinformatics and Telescience. Several Dutch universities, academic hospitals and industries in the life sciences and ICT domain participate in this project. There is also strong collaboration with NBIC (Netherlands Bioinformatics Centre). The recently started Dutch BIG GRID project will build a nationwide production grid, making use of methodology still being developed within VL-e.

DAS-3: The Next Generation Grid Infrastructure in the Netherlands

The Distributed ASCI Supercomputer 3, or DAS-3, is a computer science grid with a revolutionary optical interconnect, used as the primary platform for fundamental grid research in the Netherlands.

The DAS-3 consists of five clusters distributed across the Netherlands. It was designed by the Advanced School for Computing and Imaging (ASCI). DAS-3 is funded by NWO/NCF (the Netherlands Organization for Scientific Research), the VL-e project, MultimediaN and participating universities.

The goal of DAS-3 is to provide a common computational infrastructure for researchers within ASCI, who work on various aspects of parallel, distributed, and grid computing, and applications like large-scale multimedia content analysis. Within VL-e, DAS-3 is used as part of the Rapid Prototyping environment.

DAS-3 consists of clusters at the following organizations:

•Vrije Universiteit, Amsterdam (VU)

•Leiden University (LU)

•University of Amsterdam (UvA)

•Delft University of Technology (TUD)

•The MultimediaN Consortium (UvA-MN)

An important innovative aspect of the DAS-3 system is the wide-area communications infrastructure between the clusters. Each cluster has connectivity to the regular Internet through its local university and then on to SURFnet. To satisfy higher demands in bandwidth and latency, the StarPlane project collaborates with SURFnet to enable DAS-3 to use dedicated 10Gbps lightpaths across the innovative hybrid network SURFnet6 between clusters.

We also cooperate with the French Grid'5000 project. The combination of these two systems provides users with an international testbed. SURFnet6 provides a high bandwidth optical link between the DAS-3 and Grid'5000, allowing for high bandwidth experiments across Europe.

DAS-3 Website:
http://www.cs.vu.nl/das3

vl-e facts

budget 40 M, period 2004-2008
more than 20 consortium partners from industry and academia
director: prof. dr. L.O. Hertzberger
website: http://www.vl-e.nl

consortiumpartners

A&F Wageningen, AMC, CWI, DSM, Friesland Foods, FEI, FOM AMOLF, NBIC, Nikhef, IBM, LogicaCMG, Philips Research, Philips Medical, SARA, Top Institute Food and Nutrition, TNO Kwaliteit van Leven, TU Delft, Unilever, UvA-IBED, UvA-IvI, UvA-SILS, VU, VUmc, WTCW