

1 Publishable Summary



DEISA

Distributed European Infrastructure for Supercomputing Applications

The DEISA Consortium continues its work in the DEISA2 project with EU FP7 support from 2008 to 2011. DEISA2 focuses on the provisioning and operation of infrastructure services which allow its users to work efficiently within a distributed high performance computing environment. Through these services and the continued operation of a world-class infrastructure of global importance, DEISA2 contributes to the effective support of world-leading computational science in Europe. As final goal DEISA2 is aiming to advance the existing distributed European HPC environment to a turnkey operational solution for a persistent European HPC ecosystem.

Towards a Pan-European wide HPC turnkey solution

During the second project year four new systems, one ranked in the Top10, have been successfully integrated into the existing infrastructure. It has to be emphasized that the variety of hardware architectures now provided by DEISA has been increased. The DEISA software stack and user environment had to be ported accordingly. The modular concept of the stack eased this in principle complex task and proves the right concept for the future.

The Pan-European HPC infrastructure operated already consists of:

- Dedicated 10Gbit Network
- Global File System and Fast Data Transfer Tools
- Unified Job Submission and Workflow Management, including Portals
- Global Authentication, Authorization and Accounting Services
- Unified User Environment and Support

This infrastructure is complemented by the tight collaboration of the administrative and user support staff of all sites by having an Operator on Duty and a Helpdesk on Duty switching weekly from one site to the next.

Associate partners

After integration of CEA, the integration of CSCS and KTH has nearly been completed, thus adding the two new countries Switzerland and Sweden to the European Tier1 HPC stack.

DEISA Extreme Computing Projects

The DEISA Extreme Computing Initiative (DECI), launched in 2005, continues to support the most challenging supercomputing projects in Europe which require the special resources and skills of DEISA. A European Call for Extreme Computing Proposals is published annually. By selecting the most appropriate supercomputer architectures for each project, DEISA is opening up the currently most powerful HPC architectures available in Europe for the most challenging projects. This mitigates the rapid performance decay of a single national supercomputer within its short lifetime cycle of typically about 5 years, as implied by Moore's law.

The DECI call 2009 with 75 proposals was asking for 220 million cpu-hours. Fifty scientific projects were awarded supercomputing resources (50 million cpu-hours). The DECI call 2010 ending in Feb 2010 resulted in 122 proposals, asking for more than half a billion cpu-hours. Applications support for these DECI projects is distributed over the partner sites, using the specialist knowledge of each site for the improvement.

So far scientists from 24 different European countries with collaborators from four other continents have benefited.

Support for European Virtual Scientific Communities

In DEISA2 the consortium has extended its service provisioning model from individual project support, as in the DEISA Extreme Computing Initiative, to service provision for some specific European user communities. Following a public call, the service started in the first project year for the following communities:

- EFDA (Fusion)
- Euforia (Fusion)
- LFI-Planck (Space Science)
- Virgo/COSMOCOMP (Cosmology)
- ENES (Climate)
- VPH (Life Science) + VIROLAB (Life Science)

Communities were supported with the allocation of CPU cycles (6 out of 7), technological help for community specific access to the infrastructure (2 out of 7), application help for porting codes (5 out of 7), and test access to various state of-the-art supercomputers (2 out of 7).

VIROLAB ended in 2009, and Virgo/Cosmocomp was first focussing on data base enhancing aspects. For the other five communities, support was continued in 2010.

European Leadership in the HPC domain

Demonstration of the worldwide *European Leadership* in the HPC domain is reflected in invitations to conferences and collaborations worldwide. Many keynote talks and invited talks to explain the European concepts implemented in DEISA show the interest. These concepts influence other projects in the world and the collaborations of DEISA2.

Standards and Interoperability

To facilitate international scientific collaborations DEISA2 continues to collaborate and contribute to the implementation of standards for interoperation and handling commonalities. This includes participation in OGF and its working groups, the Infrastructure Policy Group IPG (with members DEISA, EGEE, NAREGI, OSG, and TeraGrid) and the European E-Infrastructure Forum EFF (with members DANTE, TERENA; EGEE, EGI, PRACE and DEISA).

Disseminating knowledge and training

All positive developments of the project and the continued effort of the Dissemination Team lead to a high international visibility. There have been many keynote and invited talks at conferences all around the world. Major dissemination events were the delivery and public show of the new DEISA video, the joint DEISA PRACE booth at supercomputing conference 2009 in Portland, and a BOF at the supercomputing conference 2009 about European HPC and Grid Infrastructures.

A highlight was again the now second joint DEISA PRACE Symposium 2010 in Barcelona with over 130 participants from 23 different countries.

Regular training activities complement the portfolio for supporting the efficient exploitation of the supercomputing technologies and resources.

Summary of overall progress

Results in the second year continue at the high level already achieved during the first year.

After CEA, integration of partners CSCS and KTH was addressed and has nearly been completed. DEISA continues to support the high number of integrated different HPC architectures, the number of integrated key HPC centres in Europe, with major HPC expertise also in complementary areas, the related European user communities, an increasing number of supported European HPC projects, and the number of international collaborations with top level organizations.