Introducing PROSPECT e.V.
A European Technology Platform for HPC

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Prospect e.V.

• stands now for “Promotion of Supercomputing Partnerships for European Competitiveness and Technology”.
• started with a Memorandum of Understanding signed by 12 European Parties involved in High Performance Computing at October 24, 2007.
• was established as an official association on December 15, 2008.
• consists of European Supercomputing Centers, university chairs, and several companies offering hard- or software for High Performance Computing (HPC).
• is an open interest group with the purpose of furthering science and research in the field of supercomputing and technologies associated therewith with a European focus.
The purpose of the association

1. The purpose of the association is the furtherance of science and research in the field of supercomputing and technologies associated therewith.
   – Provide HPC information platform for its members.
   – Act as HPC advocate in Europe.
   – Facilitate connection to PRACE.
   – Foster the creation of an HPC ETP.

2. The association will realize its purpose in particular by holding scientific presentations and supporting research projects.

3. The association is politically and denominationally neutral.

4. The association is altruistic and is predominantly non-profit.
Prospect e.V. founder members

- Forschungszentrum Jülich (FZJ)
- Leibniz-Rechenzentrum (LRZ-BAdW)
- Barcelona Supercomputing Center (BSC)
- CSC – IT Centre for Science LTD.
- Deutscher Wetterdienst (DWD)
- Bull GmbH
- ClusterVision
- DataDirect NETWORKS GmbH
- Intel GmbH
- Numascale AS (Dolphin)
- ParTec Cluster Competence Centre GmbH
- T-Systems Solutions for Research GmbH
Further Prospect e.V. members (as of October, 2011)
32 Members from 7 countries in total

- Eurotech
- HLRS
- Mellanox
- Dell
- IBM Deutschland
- Oracle (SUN)
- Supermicro
- Univ. Heidelberg
- Hewlett Packard GmbH
- Technische Universität Chemnitz
- KIT Karlsruhe
- CRAY
- DKRZ
- T-Platforms
- Netherland Natl. Comp. Fac. Found (NSF)
- NVIDIA GmbH
- MEGWARE Computer GmbH
- Micron Semiconductor
- QLogic Germany GmbH
- Friedrich Schiller Univ. Jena
High Performance Computing in Europe: a vision for 2020

- REPORT OF THE PROSPECT ASSOCIATION - ©2011
- This document defines the vision for High Performance Computing in Europe in 2020 and is edited by the members of the PROSPECT Association in view of inducing future collaborations with any organisation that shares partially or fully this vision.
- This paper is on PROSPECT’s homepage www.prospect-hpc.eu
Vision 2020 - key principles -key achievements (needed)

- Europe will be a global leader in inventions that successfully exploit HPC resources.
- HPC will provide increasingly accurate and responsive predictions on both short and long-term phenomena that impact European citizens, such as weather, climate change, and epidemics.
- The use of HPC will enable Europe to achieve world-leading levels of energy-efficiency in areas such as electricity generation and transmission, transport, food supply chain, water supply, product design etc.
- HPC technologies designed in Europe will lead in energy-efficiency.
- Europe will have the know-how and skills to master the development of HPC technology components in the areas where it excels, and to
- Master the exploitation of HPC across a wide range of industries and disciplines.
PROSPECT launched a European Technology Platform (ETP)

• PROSPECT, an open European association of leading suppliers and users of supercomputers from industry and academia, started on July 21st, 2011, a European Technology Platform for High Performance Computing. Its aim is to help Europe realize the highly promising economic, scientific and societal benefits of High Performance Computing (HPC).

• The Technology Platform will define research priorities for European HPC in the form of a Strategic Research Agenda submitted to the Commission and will help ensure that public investment in HPC delivers the widest possible benefit to European business and society.
ETP Description

What are those ETPs?
• European Technology Platforms focus on strategic issues where achieving Europe’s future growth, competitiveness and sustainability depends upon major technological advances.
• They bring together stakeholders, led by industry, to define medium to long-term research and technological development objectives.
• Technology platforms play a key role in better aligning EU research priorities to industry’s needs.
• They cover the whole economic value chain, ensuring that knowledge generated through research is transformed into technologies and processes, and ultimately into marketable products and services.

Why are they important?
• To remain competitive, European industry needs to specialise more in high-technology areas. Investment in research must be increased, coordination across Europe enhanced and the technological content of industrial activity raised. Technology platforms address these challenges through:
  • Shared vision of stakeholders;
  • Positive impact on a wide range of policies;
  • Reduced fragmentation of research and development efforts;
  • Mobilisation of public and private funding sources.
## Research Challenges of ETP (examples)

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<thead>
<tr>
<th>Power and cooling</th>
<th>Memory and Storage</th>
<th>Concurrency and Locality</th>
<th>Resiliency and Fault Tolerance</th>
<th>Programmability and Application scaling</th>
<th>Parallel File Systems</th>
<th>Silicon optics</th>
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<tr>
<td>Low-energy consumption HPC architectures using indigenous European components</td>
<td>Low-power memory technologies, such as non-volatile storage (Flash, PCM)</td>
<td>Programming languages and tools for concurrent programming mode</td>
<td>Development of latency tolerant programming models to cope with the latency of non-volatile memories</td>
<td>File access with end-to-end data security</td>
<td>Optical interconnects for extreme fast transmission of data</td>
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<td>Performance analysis tools to improve the efficiency on the use of resources</td>
<td>Novel memory and storage solutions</td>
<td>New algorithms for upscaling applications to peta-scale performance</td>
<td>Adapting applications and algorithms for dynamic load balancing in case of failures</td>
<td>Parallel programming models for code portability across multiple heterogeneous architectures (e.g. GPU, FPGA)</td>
<td>Highly scalable parallel file systems</td>
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**prospect hpc**

**HIGH PERFORMANCE COMPUTING**
Modus-operandi of the European Technology Platform on HPC.
Application for Membership

Only legal entities are able to join the Prospect association. Firstly, the new party needs to sign the “application for membership“-form and introduce his institution or company during one of Prospect’s General Meetings. After that a ¾ majority of the general meeting is necessary to become a full member of Prospect e.V. Denial of membership does not have to be justified.

The annual membership fee is 500 EUR.
The Prospect e.V. Executive Committee

• consists of:
  – Francesc Subirada (BSC)
  – Thomas Lippert (FZJ)
  – Arndt Bode (LRZ-BAdW)
• determines a spokesman from among its members.

PROSPECT Administration : ParTec Cluster Competence Center Office in Munich:

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Next General Meeting Oct. 18, 2011 @ Barcelona Supercomputing Center, Spain