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Research Infrastructures

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PRACE-2IP

PRACE Second Implementation Project

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Industrial Seminar

5th PRACE Executive Industrial Seminar 2013

Final

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References and Applicable Documents

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[2] PRACE-3IP, Deliverable D5.1 "Analysis of Models and Practices for Industrial Access", December 2012

[3] PRACE-3IP, Deliverable D5.2 "PRACE Integrated HPC Access Programme for SMEs", February 2013

List of Acronyms and Abbreviations

AISBL	Association International Sans But Lucratif (legal form of the PRACE-RI)
BSC	Barcelona Supercomputing Center (Spain)
CEA	Commissariat à l'Energie Atomique (represented in PRACE by GENCI, France)
CINECA	Consorzio Interuniversitario, the largest Italian computing centre (Italy)
CINES	Centre Informatique National de l'Enseignement Supérieur (represented in PRACE by GENCI, France)
EPCC	Edinburg Parallel Computing Centre (represented in PRACE by EPSRC, United Kingdom)
FZJ	Forschungszentrum Jülich (Germany)
GCS	Gauss Centre for Supercomputing (Germany)
GENCI	Grand Equipement National de Calcul Intensif (France)
HLRS	High Performance Computing Center Stuttgart (Germany)
HP	Hewlett-Packard
HPC	High Performance Computing; Computing at a high performance level at any given time; often used synonym with Supercomputing
HWW	Höchstleistungsrechner für Wissenschaft und Wirtschaft GmbH (High Performance Computing for Science and Industry)
ISV	Independent Software Vendor
JSC	Jülich Supercomputing Centre (FZJ, Germany)
LRZ	Leibniz Supercomputing Centre (Garching, Germany)
MPI	Message Passing Interface
Open MP	Open Multi-Processing
PRACE	Partnership for Advanced Computing in Europe; Project Acronym
SME	Small- and Medium-sized Enterprise
STFC	Science and Technology Facilities Council (represented in PRACE by EPSRC, United Kingdom)
Tier-0	Denotes the apex of a conceptual pyramid of HPC systems. In this context the Supercomputing Research Infrastructure would host the Tier-0 systems; national or topical HPC centres would constitute Tier-1
WP	Work Package

Executive Summary

The 5th PRACE Executive Industrial Seminar was an important step strengthening PRACE's industrial relations. The main objectives of this year's Industrial Seminar were:

- The introduction of SHAPE, the SME High Performance Computing Adoption Programme in Europe, which will be implemented by a pilot project starting in June 2013.
- An introduction to Europe's most exciting HPC applications used in industry and how they have changed their organizations prototyping and simulation paradigms.
- Understanding the requirements of and enhancing the programme access for large companies.

The seminar's programme reflected the focus on SMEs. In order to meet the different requirements of large companies and SMEs, the PRACE Programme Access for Industry was dealt with in two parallel sessions, and a panel session was devoted to the discussion of the benefits and drawbacks of using open source software in industry.

Further topics were the presentation of the state-of-the-art of using HPC in different industrial fields like engineering, finance, medical and pharmaceutical, as well as an overview of the results obtained by companies using the PRACE infrastructure. In addition, thematic sessions on HPC industrial applications in particular in the automotive and aerospace industry have been provided.

A highlight was the presentation of the award for the Most Innovative HPC Solution in Europe. The winner of the second round of the open competition is the CERFACS CFD Combustion Group, a French research organization working closely with its industrial partners. The group was awarded for developing a massively parallel CFD tool for Large Eddy Simulations of gas turbine engine combustors. The second winner of the neck-and-neck race is Termo Fluids S.L. from Spain.

The event took place in Bad Boll near Stuttgart over two half-days on the 15th and 16th of April 2013. The seminar attracted a total of 78 attendees, including 58 non-PRACE attendees and 34 speakers, who provided 34 talks and 7 parallel sessions. The feedback collected from the seminars participants showed that the event was a success. 21 of the companies were SMEs and 22 companies attended such an event for the first time. In total, the five industrial seminars have attracted as many as 142 different companies of various business and industrial profiles.

Next year's PRACE Industrial Seminar will take place in Barcelona on the 22nd and 23rd of May 2014, just a few weeks before the end of PRACE's 3rd Implementation Phase when the European Research Infrastructure PRACE and its industrial support programmes will be established permanently. At the 6th Industrial Seminar in Barcelona the final SHAPE programme and the results of the SHAPE pilot project will be presented.

Figure 1: The attendees of the Seminar on April 16th

1 Introduction and Objectives of the 5th PRACE Executive Industrial Seminar

This was the fifth seminar in a series of events targeting HPC industrial users in Europe. The event was dedicated to the extension of PRACE's industrial relations based on the Open R&D Industry Access Model which was presented at the 4th PRACE Industrial Seminar. As the requirements and needs of SMEs differ from those of large companies this year's Industrial Seminar was focused on three major objectives:

- The announcement of SHAPE – the SME High Performance Computing (HPC) Access Programme in Europe. The details of SHAPE will be worked out during a pilot project starting in June 2013 and ending in April 2014. More information about SHAPE and a summary of the parallel session concerning SHAPE is included in section 3 below.
- An introduction to Europe's most exciting HPC applications used in industry and how they have changed their organizations prototyping and simulation paradigms.
- Understanding the requirements of and enhancing the programme access for large companies. A summary of the corresponding parallel session can be found in section 4.

Among the other objectives of the seminar were:

- To present the state-of-the-art of using HPC in different industrial fields like engineering, finance, medical and pharmaceutical.
- To show results obtained by companies using the PRACE infrastructure and the software development enabled by PRACE.
- Thematic sessions on HPC industrial applications in particular in the automotive and aerospace industry.
- To discuss the advantages and disadvantages of using open source software in industry. A summary of the corresponding parallel session can be found in section 5.
- To provide an overview of the PRACE efforts in the technical evaluation of prototypes as well as in the development of new programming techniques.

- To enhance the network of PRACE's industrial contacts with a view to continue developing user and support models that will help European HPC industrial users achieve competitive advantage, in particular addressing the needs of SMEs.

The following five sections describe in some detail the topics of the Seminar. Section 0 covers the Seminar's agenda and gives some background information. Section 3 introduces the SHAPE programme and summarizes the corresponding parallel session. Short reports of the parallel sessions about the requirements of large companies and about open-source software used in industry follow in sections 4 and 5, respectively. Section 6 describes the competition for the "Most Innovative Industrial HPC End-User Application in Europe" and presents the winners.

The next two sections are devoted to the organization of the Seminar. The members of the Programme Committee are listed in section 7, and section 8 describes the preparation of the Seminar including invitation, advertising, location, social events and the social dinner. The statistics about the attendees is provided in section 9, and the feedback from the attendees in section 10. The list of attendees, the questions of the survey and the abstracts can be found in the annex.

Figure 2: Leonardo Flores Anover, European Commission Project Officer, explains the EU HPC strategy

2 The Seminar Agenda

A first version of the Seminar's Agenda was published on the Seminar's webpage (see Figure 13) at the beginning of March 2013. The Programme Committee spared no efforts to balance the time schedules of the different speakers. The final version of the programme was ready in time before the beginning of the seminar and is reproduced in Figure 4.

The programme items fall into the following categories:
Keynotes

- PRACE introduction and overview
- Reports from industry
- Success Stories
- Parallel Sessions addressing special topics as, for example, open source in industry, HPC in automotive industry and the requirements of SMEs and large companies.

The available abstracts of the talks and brief summaries of the parallel sessions are included in the annex, section 13.3. Together with slides of almost all presentations, the abstracts have been made available on the memory sticks distributed to the seminar attendees at the beginning of the seminar.

Figure 3: The plenary room

HPC Changing Europe's Industrial Landscape

5th PRACE Industrial Seminar – Bad Boll, Stuttgart Region, 15-16 April 2013 - **PROGRAMME**

DAY 1		
TIME	TOPIC	SPEAKER
12:00	Registration & Welcome Buffet	
13:30	Seminar Opening	
13:30	**Official Opening**	**Michael Resch** Director HLRS
13:45	**Welcome Address**	**Veit Haug** Director, Stuttgart Region Economic Development Corporation
14:00	**Keynote:** **The Strategic Importance of High Performance Computing for Vehicle Development using Porsche as an Example**	**Christoph Gümbel** Porsche AG
14:30	**The EU HPC Strategy**	**Leonardo Flores Anover** European Commission
15:00	**PRACE Introduction**	**Sergi Girona** Chair of the PRACE Board of Directors
15:10	**Overview PRACE Industry Access, SME Programme**	**Giovanni Erbacci** PRACE
15:20	**Coffee Break**	
Reports		
15:50	**Industrial PRACE Production Project**	**Erwan Jacquin** HydrOcean
16:10	**Industrial Emerging Application: Deterministic Modelling of 3D Seismic Scenarios**	**Marco Stupazzini** Munich Re
16:30	**Keynote:** **Accelerating Competitiveness with Leadership Computing**	**Suzy Tichenor** Oak Ridge National Laboratory
17:00	**European Technology Platform for High Performance Computing**	**Jean-Francois Lavignon** ETP4HPC
Parallel Session		
17:15	*Panel Session: Open Source in Industry* Panelists: **Paul Graham** (Moderator) **Bärbel Große-Wöhrmann** (Co-Moderator) **Daniele Bucci**, LAPCOS **Marco Stenta**, Syngenta	*PRACE Technology Watch* **Torsten Wilde** *PRACE Protoypes* **Jose Carlos Sancho** *Novel Programming Techniques*
18:00	**End of DAY 1**	
18:30	**Social Event & Seminar Dinner**	

DAY 2			
TIME	TOPIC		SPEAKER
Success Stories			
08:30	**Broadening the Scalability of TermoFluids Code**		**Ricard Borrell** Termo Fluids
08:50	**Success Story: Murex**		**Pierre Spatz** Murex
09:10	**The RT3S Project: Towards Safer Vascular Stenting**		**Alessandro Chiarini** Medtronic
Special Topics Session			
09:30	*HPC in Automotive Industry* **Yves Tourbier,** Renault **Jan Blickwede,** VW **Michael Hoffmann,** Dallara **Albrecht Gehring,** Lauer & Weiss	*HPC in Aerospace Industry* **Norbert Kroll**, DLR **Yoon Ho**, Rolls-Royce **Gregor Veble**, Pipistrel	*Emerging Applications* **Claudio Arlandini**, CINECA **Eva Casoni**, BSC **Stephane Requena**, GENCI
10:30	**Coffee Break**		
Success Story & PRACE Session			
11:00	Success Story: Novartis		**Nick Hollway** Novartis
11:20	**Industrial Advisory Committee**		**PRACE**
11:30	**Seminar Picture**		
Parallel PRACE Session			
11:40	*Requirements of & Programme Access for **Large Companies*** **Stephane Requena,** PRACE **Paul Graham,** PRACE **Alfred Geiger,** T-Systems		*Requirements of & Programme Access for **SMEs*** **Marcin Ostasz,** PRACE **Lluís M. Biscarri,** Biscarri Consultoria **Ralph Eisenschmid,** OPTIMA pharma **Andreas Wierse,** Sicos BW
Award and Closing Session			
12:30	**Presentation of the Award for the Most Innovative European Industrial HPC Application & Talk of the Awardee**		**Catherine Riviere** Chair of the PRACE Council
13:00	**Wrap up**		**PRACE**
13:20	**Announcement of the next Seminar & Seminar Closing**		**PRACE**
13:30	**Lunch and End of Seminar**		

Figure 4: The Seminar's Agenda

Figure 5: Sergi Girona, Chair of the PRACE Board of Directors

Figure 6: Suzy Tichenor, Oak Ridge National Laboratory, who gave a presentation about industry support in the US

SHAPE - SME HPC Access Programme in Europe

Pilot Project Summary

SHAPE, the **S**ME **H**igh Performance Computing (HPC) **A**ccess **P**rogramme in **E**urope is a pan-European, **PRACE**-based programme supporting HPC adoption by SMEs. The Programme aims to equip Small and Medium-sized Enterprises (SMEs) with the awareness and expertise necessary to take advantage of the innovation possibilities opened by HPC, increasing their competitiveness. The mission of this Programme is to help European SMEs to demonstrate a tangible Return on Investment (ROI) by assessing and adopting solutions supported by HPC, thus facilitating innovation and/or increased operational efficiency in their businesses.

SHAPE aims to overcome the following barriers to HPC adoption:

- Lack of expertise in and/or knowledge of the possibilities of HPC and advanced numerical simulation
- Lack of resources to facilitate the HPC adoption process
- The entry costs of implementing new technologies.

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Developing such a comprehensive programme through PRACE is the most effective option. For example, a pan-European programme can provide resources and expertise that the existing national or local programmes are unable to cater for. Also, a pan-European initiative will open new possibilities for companies based in countries where there is no local programme. Thus, the Programme is complementary to local initiatives. As locality helps to lower existing barriers, all projects will be served locally first, if that is the better option and if a local initiative exists in the respective country. **SHAPE** will be employed for projects that cannot be supported locally or for amplifying the outcome of national initiatives at PRACE level (providing access to more HPC resources or allowing SMEs to be visible in the market of 25 PRACE member countries and beyond).

In order to support European SMEs, **SHAPE** will develop an integrated service offer:

- Information and networking
- Access to expertise (science-domain expertise as well as applied mathematics, HPC and computer science expertise)
- Access to HPC systems (including pre- and post-processing and computing services)
- Information on funding sources.

The main focus of the Programme's operations will be to work on a one-to-one basis with SMEs willing to adopt a new, HPC-supported solution. The Programme will be able to take such companies as far as trying out the solution on the Programme's (i.e. PRACE's) infrastructure. The existing solutions such as the PRACE Open R&D Access Programme (www.prace-ri.eu/Industry-Access), the PRACE Advanced Training Centres (PATCs - www.prace-ri.eu/PRACE-Advanced-Training-Centres) and the PRACE Implementation Phase Project's Open Source code enabling activity (www.prace-ri.eu/IMG/pdf/D9-1-1_2ip.pdf) will be employed in order to provide some of the Programme's services.

To evaluate various solutions for practical project implementation, the PRACE Project will run a Pilot commencing in June 2013 and ending in April 2014. The **SHAPE** team will be looking for SMEs willing to "give HPC a try" with the help of our team.

For further information on this Programme, please contact the **SHAPE** team at shape@prace-ri.eu.

The Partnership for Advanced Computing in Europe (PRACE) is an international non-profit association with its seat in Brussels. The PRACE Research Infrastructure provides a persistent world-class high performance computing service for scientists and researchers from academia and industry in Europe. The computer systems and their operations accessible through PRACE are provided by 4 PRACE members (BSC representing Spain, CINECA representing Italy, GCS representing Germany and GENCI representing France). The Implementation Phase of PRACE receives funding from the EU's Seventh Framework Programme (FP7/2007-2013) under grant agreements RI-261557, RI-283493 and RI-312763. For more information, see www.prace-ri.eu.

www.prace-ri.eu

e-infrastructure

The SHAPE programme is an action of PRACE-3IP, WP5 which receives funding under grant agreement RI-312763 of EU FP7/2007-2013

Figure 7: The flyer of the SHAPE programme

3 SHAPE

The European Commission clearly recognized the importance of improving the access to HPC for SMEs: “Especially for SMEs, access to HPC, modeling, simulation, product prototyping services and consulting is important to remain competitive. … Member States are encouraged to set up HPC competence centers that facilitate access of industry and specifically SMEs to HPC services, and should support supercomputing centers to transfer expertise to them.” [1]

he special prerequisites and requirements of SMEs were analyzed in depth by PRACE-1IP WP5 “Industrial User Relations”. A summary can be found in [2]. The main needs are:

- Access to knowledge of HPC hardware and software and to expertise on the possibilities of HPC (technology transfer)
- Access to HPC resources which provides the opportunity to ‘try-out’ HPC solutions (without committing to extensive investments)

In order to meet these requirements a HPC support programme for European SMEs has been prepared by PRACE-3IP WP5 “Services for industrial users and SMEs” based on the experience gained during PRACE-1IP WP5 and the former Industrial Seminars. The mission of SHAPE, the Small- and Medium-Sized Enterprises (SME) High Performance Computing (HPC) Access Programme in Europe, is “to help European SMEs to demonstrate a tangible Return on Investment (ROI) by assessing and adopting solutions supported by HPC, thus facilitating innovation and/or increased operational efficiency in their businesses.” [3]

It is planned to work on a one-to-one basis with SMEs: initial coaching and training, advising how to apply for the PRACE Open R & D Access Programme and supporting code development and optimization.

The next step in the practical implementation of SHAPE is a pilot project managed by PRACE-3IP WP5 which will refine the details, start in June 2013 and end in April 2014.

3.1 The SHAPE flyer

The text in Figure 7 above was distributed during the event in order to introduce the SHAPE Programme as one of the main pillars of PRACE’s industrial relations.

3.2 Summary of the Parallel Session “Requirements of & Programme Access for SMEs”

This session was moderated by Marcin Ostasz, BSC, speaking on behalf of PRACE. First, the concept of the SHAPE Programme, the PRACE-supported HPC adoption programme for SMEs was introduced. Following that, the guest speakers

- Lluís M. Biscarri, Biscarri Consultoria
- Ralph Eisenschmid, OPTIMA pharma
- Andreas Wierse, SICOS BW

Figure 8: The panel of the Parallel Session "Requirements of and Programme Access for SME's"

presented their point of view on the operation of the Programme. There was also a good interaction with the audience who had a number of questions and remarks. The main conclusions of the session are:

- The most difficult task will be to find and identify the SMEs interested in the Programme. There is a concern that the available PRACE contacts will not be sufficient for that purpose. HPC-consulting companies, who already have an established network of contacts in the area, are a possible channel.
- Another difficulty will be convincing SMEs to 'give HPC a go'. A significant Programme effort should be dedicated to this activity as such SMEs offer the largest potential in terms of Return of Investment.
- There is also an untapped potential in cooperation with larger companies – SMEs could become the providers of HPC solutions to them.
- The HPC Centres should become more SME-friendly in order to attract customers from this market.

4 Summary of the Parallel Session “Requirements of and Programme Access for Large Companies”

Chairs: Paul Graham (EPCC), Stéphane Requena (GENCI)

This session was initiated with a presentation from Stéphane Requena of GENCI, speaking on behalf of PRACE. Stéphane gave an overview of what PRACE had provided for large companies to date, such as hardware access, provision of expertise in the form of training and software enabling activities, and the open research and development calls. Then the work of PRACE going forward was discussed, such as longer term "pre-competitive" research and development, the SHAPE program for SME access (of relevance to large companies as they have reliance on SMEs in, say, their supply chain), and the collaborative assessment of hardware and software prototypes.

Following this, Alfred Geiger of T-Systems gave a presentation on "HPC Provisioning for Industrial Corporates". This talk principally looked at how industry differs from public science and research in its approach to HPC services, such as in the provision of capacity and capability computing for short and long term commitment: cloud, dedicated systems, HPC access. For industry Tier-0 or Tier-1 systems are generally uneconomic, so they should be provided as public infrastructure, with and analogy to roads or airports. Dr Geiger then introduced the High Performance Computing for Science and Industry (HWW) initiative with T-Systems and HLRS among the partners. This initiative is a public-private partnership to provide high-end HPC for both science and industry, and enables links between SMEs, ISVs, and resource providers.

The discussions following the talks raised the following points:

- PRACE can be viewed as being a catalyst in enabling industry to engage with academics.
- PRACE representatives can visit with companies to present and discuss the collaborative opportunities.
- The companies’ desire is that PRACE provides ongoing support and services as well as one-off demonstration or proof-of-concept projects.
- Security issues remain a real concern and barrier for large companies, such as when their data or code is being run on a shared environment, as even the name of the executable being run may provide information to competitors as to the companies’ intentions.
- Companies require HPC at both ends of the parallel performance spectrum: as well as large-scale simulations on 1000s of cores, many industry codes would find advantage in being able to run on 10s or 100s of cores.
- Validation of methods and results can be a key factor for many industry simulations, often due to regulatory requirements.

5 Summary of the Panel Session “Open Source in Industry”

Chairs: Paul Graham (EPCC), Bärbel Große-Wöhrmann (HLRS)

In this session there were two talks. Firstly, Daniel Bucci of LAPCOS gave a presentation on the "Virtual Test Bench for Centrifugal Pumps". LAPCOS is a consortium involved in engineering activities using advanced computational tools, and has strong links to CINECA and their HPC activities. LAPCOS has developed a software tool, OpenPump, to provide pre- and post-processing for CFD simulations of centrifugal pumps using OpenFOAM as the underlying simulation engine. This tool provides a user-friendly interface to explore the performance of these pumps and enables a rapid investigation of the properties of the pumps.

Secondly, Marco Stenta of Syngenta Crop Protection Research gave a presentation titled "Open Source and Crop Protection". Demand for improvement in crop protection is driven by the increasing global population and land scarcity. Computational techniques can be employed in this research via molecular modeling to allow virtual screening of promising leads. There is various open source software available to assist with this, and the remainder of Dr. Stenta's talk discussed the pros and cons of using Open Source software.

The two key points arising from the talks and the subsequent discussion were:

- Open source can clearly be a "very good thing". It is flexible, arguably cheaper, and can enable fast scientific knowledge transfer between academia and industry.
- But, users must be aware of potential pitfalls. For example, there may be few (if any) quality guarantees, end-user commitment can potentially be high, robustness of the software in comparison to commercial offerings can be lacking, and support may fade out or not exist at all.

6 Competition for the Most Innovative Industrial HPC End-User Application in Europe

6.1 The Competition – Text of the announcement

The objective of this contest is to award the boldest industrial HPC end-user application – we want to see how far one can take this technology in changing the present paradigms of HPC use by European industry. As usual, this competition is open to all fields of HPC and industrial sectors.

This year’s competition (its second round) is open to end-user applications challenging the traditional way of doing business in Europe. We are looking for compelling HPC solutions submitted by industrial end-users that address a specific business problem within the industrial environment of the applicant, changing the operational patterns of their business.

It is not necessary to take part in the seminar in order to participate in the Competition.

The conditions are as follows:

- All submitted applications must address a business issue previously unresolved within the organization of the applicant.
- The solution must have been developed and implemented in Europe.
- The solution must pertain to industry, i.e. it must be possible to apply it in an industrial context with clear benefits to the user.

- The solutions must represent some level of implementation maturity – we are not looking just for untested ideas but rather for working solutions, although we will also accept those in early implementation stages.
- We are not evaluating the complexity of the selected solution. Rather, we are looking for innovative ways of using HPC in a business context, with clearly defined benefits for the applicant's organization in terms of e.g. Return on Investment, increasing market share, added value, enabling transfer of technology, etc.
- We will consider solutions at all levels of HPC as long as HPC is used explicitly as technology.

The applicants will be required to provide up to three pages description of the solution submitted together with current results and some further interesting applications. There will be an application form available at registration to facilitate this process with the following paragraphs:

- Who applies? – Brief introduction of the company together with a contact person.
- What is it? – Functional description, application field and market potential.
- How does it work? – The technological process involved, the uniqueness of the selected solution.
- Why has HPC been chosen as the technological vehicle and how has it been implemented?
- What is the business issues addressed and resolved through this application?

The award will be approved by a Jury with the following members:

- The team of Work Package 9 of PRACE - 2IP and representatives of PRACE Scientific Steering Committee (SSC – as provided by the SSC based on a Project Manager's request through the AISBL).

Award criteria:

- Clear benefit for industry in terms of Return on Investment – 40%
- The weight of the role of HPC in the solution presented – 20%
- The scalability of the solution process – 20%
- Novelty, originality and uniqueness – 10%
- Maturity and market perspectives - 10%

Prize: Participation in the next International Supercomputing Conference (17th-20th June 2013, Leipzig, Germany) – and an opportunity to utilize the PRACE booth at the event.

Process:

1. Collect applications and all data necessary prior to the seminar (during registration) – application deadline = 31st March 2013.
2. Have the jury make a decision prior to the seminar.
3. Invite the winner to the 5th Industrial Seminar (if they are not coming anyway) – 15/16 April 2013 in Stuttgart.
4. Announce the result at seminar end and award the prize.

Figure 9: Catherine Rivière, Chair of the PRACE Council, congratulates the winner, Bijan Mohammadi of CERFACS


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Most Innovative Industrial HPC End-User Application in Europe
Thursday 27 December 2012
Open Competition in conjunction with the 5th PRACE Executive Industrial Seminar
Stuttgart, Germany – 15 and 16 April 2013
PRACE Open Competition
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The applicants will be required to provide up to three pages description of the solution submitted together with current results and some further interesting applications. There will be an application form available at registration to facilitate this process with the following paragraphs:
Who applies? – Brief introduction of the company together with a contact person
What is it? – Functional description, application field and market potential; how does it work? – The technological process involved, the uniqueness of the selected solution
Why has HPC been chosen as the technological vehicle and how has it been implemented?
What is the business issues addressed and resolved through this application?
High Performance Computing
Europe's place in a Global Race
16 June 2013
PRACE SCIENTIFIC CONFERENCE 2013 at ISC'13
Call announcements
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Open e-IRG Workshop in Dublin on 22-23 May 2013
23 April 2013
The VSB-Technical University of Ostrava, Czech Republic is searching for suitable candidates for post-doctoral research positions
22 April 2013
PRACE Newsletter 11
16 April 2013
PUMPS 2013: Programming and tUning Massively Parallel Systems Summer School
16 April 2013
PRACE Digest 2/2013 is out: Special issue on Industrial use of PRACE resources and applications
15 April 2013
More PRACE News

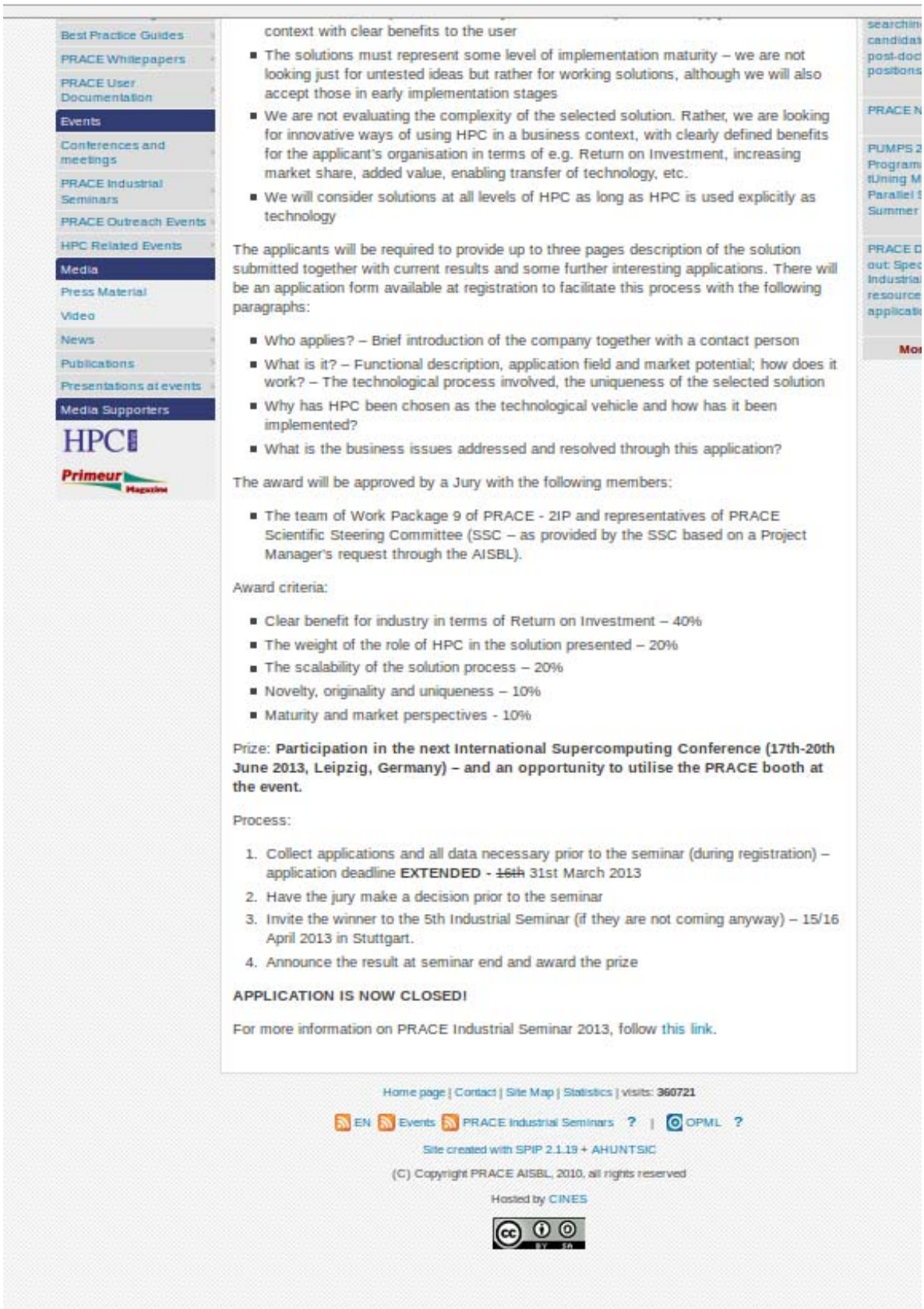


Figure 10: Webpage of the competition (screenshots)

6.2 The winning solution

Five companies took part in the competition:

1. Sciences Computers Consultants (France) with solution “XimeX HPC”,
   business domain: Energy / aerospace / pharmacy.
2. NICE srl (Italy) with solution “NICE Remote HPC Visualization”,
   business domain: ISV.
3. CERFACS (France) with solution “AVBP”,
   business domain: Automotive, energy, aerospace, aeronautical propulsion, fluid mechanics.
4. Termo Fluids S.L. (Spain) with solution “Multilevel Wind Energy Simulations”,
   business domain: Energy.
5. DigiCortex (Germany) with solution “The DigiCortex Engine”,
   business domain: Medical, pharmacy, biotech.

Short summary of the solution “AVBP” presented by the winner CERFACS:

Large Eddy Simulation (LES) has been clearly identified by the scientific combustion community as a great tool to improve combustor design since giving access to the fully unsteady features of the processes occurring in these devices. Developing such a tool for industrial use while guarantying efficient use of the computing power needed for these applications is however still a great challenge today and only a few groups worldwide offer such capabilities to industry. CERFACS combustion group is one of them if not the only one which by its presence at the interface between the industrial aeronautical application, super-computing and fundamental research can provide today to its scientific and industrial partners the LES code AVBP. Thanks to continuous developments and demonstrations, the tool is now used by the aeronautical, energy and automotive industries on major super computing architectures in Europe as well as at the source of fundamental research worldwide. It has also been at the root of many demonstrations and computations covering not only combustor ignition sequences but also thermo acoustic instabilities of real operating engines as well as evaluations of industrial design criteria illustrating the power of such tools.

Short summary of the solution presented by the second winner Termo Fluids:

Development of a software platform to simulate and improve wind farms performance. The extreme computing requirements for this superb aeroelastic problem, leads us to bet on multilevel approaches combining different levels of complexity and accuracy.

Short summary of the solution presented by the third winner DigiCortex:

The DigiCortex project aims to accelerate medical, pharmacy and biotech research and development processes by providing an extensible software environment for simulation of large, biologically plausible neural circuit models on massively parallel heterogeneous HPC platforms with GPU acceleration.

7 The Programme Committee

The seminar was organized by a Programme Committee consisting of members of Work Package 9 of PRACE-2IP, Work Package 5 of PRACE-3IP and a Local Organizing Committee.

7.1 The members of the Programme Committee

Pedro Alberto – Universidade de Coimbra/Portugal
Claudio Arlandini – CINECA/Italy
Thomas Bönisch – HLRS/Germany
Paul Graham – EPCC/UK
Bärbel Große-Wöhrmann – HLRS/Germany
Tomas Karasek – VSB-Technical University of Ostrava/Czech Republic
Nicolas Mignerey – GENCI/France
Marcin Ostasz – BSC/Spain
Georgi Prangov – NCSA/Bulgaria
Stéphane Requena – GENCI/France

7.2 The members of the Local Organizing Committee

Florian Seybold – HLRS/Germany
Thomas Weitzel – HLRS/Germany

8 The Seminar Preparation Process

The preparation of the seminar started in March 2012 when an appropriate date for the seminar was settled. The seminar date and location was announced at the 4th PRACE Executive Industrial Seminar in Bologna in April 2012.

8.1 Seminar Organization

The following steps have been performed to organize the seminar:

- First discussions about the agenda and the meeting hotel have been started in WP9, Task 2 in July 2012.
- The meeting Hotel has been booked in August 2012.
- Starting in early October 2012, the members of the Programme Committee held weekly conference calls.
- A dedicated email list has been setup for the Programme Committee and as a central communication point for all requests and communication concerning the seminar.
- Decision on the seminar objectives was taken.
- The keynote presentations have been agreed on and the keynote speakers have been invited.

- Agreement on the structure of the Agenda and work on the panel sessions as well as on the parallel sessions were taken.

Additionally, a main part of the „Joint F2F PRACE 2IP-WP9 and 3IP-WP5 meeting“ in Bologna 24-25 January 2013 was devoted to the organization of the Industrial Seminar.

8.2 Advertising and invitation

To advertise the seminar, several efforts have been undertaken. Besides the announcement during the previous seminar, the flyer “SAVE THE DATA”, reproduced in Figure 11, was designed for advertising the Industrial Seminar at the Super Computing Conference SC12, Salt Lake City, in November 2012. It has been distributed at the PRACE booth and by the involved HPC centers. The Seminar’s webpage showed in Figure 13 was setup in December 2012 and has been continuously updated.

The online registration was opened on February 13th, 2013. Personal invitation letters were sent out by the Programme Committee members starting in February 2013 to all available contacts of PRACE. The official PRACE invitation letter can be found in Figure 12.

8.3 Material distributed to the attendees

The attendees received a conference folder with the agenda, presentation abstracts, the SHAPE-Flyer, information about the social events and the dinner, short biographies of the programme and local organizing committee and information about the hosting High Performance Computing Center Stuttgart (HLRS). Additionally, the magazine INSIDE edited by the three German High Performance Computing Centers and the PRACE Digest were provided. An USB-Stick was given including the slides of almost all presentations.

SAVE THE DATE!

Stuttgart, April 15th and 16th, 2013

5th PRACE INDUSTRIAL EXECUTIVE SEMINAR

HPC Changing Europe's Industrial Landscape

PRACE is pleased to announce the **5th PRACE Industrial Executive Seminar** which will take place in Stuttgart, Germany on 15th and 16th of April 2013. This will be a key event in the process of developing PRACE's relationship with Industry. We would like to use this opportunity to show results which have been obtained by companies using the PRACE infrastructure, review PRACE's Industrial Offer and introduce PRACE's Industrial Advisory Committee (IAC), as well as tackle a number of significant business and technological topics in the HPC industrial use area.

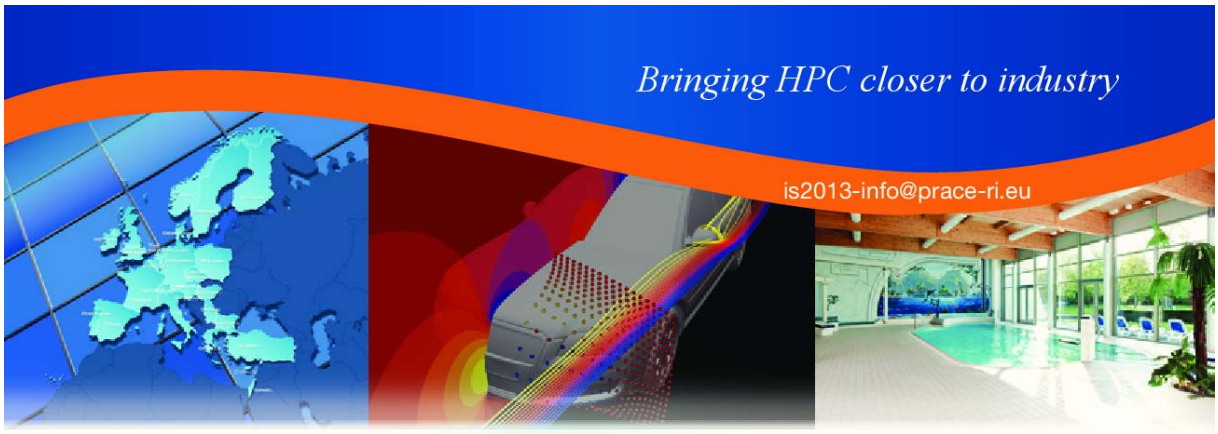
Who should attend?

This is an event for **key decision makers in the area of modelling, numerical simulation and technology** who understand the benefits of applying new solutions in a broad business context. PRACE welcomes all experts interested in HPC as an industrial technology tool and in working together with PRACE on improving Europe's competitive position.

What topics should you expect at the Seminar?

- **Key Note Speakers from Europe's leading innovative companies** introducing Europe's most exciting HPC applications and how they have changed their organisations prototyping and simulation paradigms
- **Thematic Sessions** on HPC industrial applications e.g. in the automotive or pharma industry
- A Workshop on how HPC application **changes the behaviour of supply chains** (customers and suppliers)
- An opportunity to learn **how HPC can help saving time and money as well as improving quality and accuracy**
- **A special focus on SMEs** and their strategies using HPC. Insight about the ongoing definition of a PRACE Special Programme for SMEs.
- **PRACE's Industrial Open Research Access Programme** and how your company could benefit from that initiative

PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE



PRACE INDUSTRIAL SEMINARS

Already a tradition in the European HPC landscape, they serve as a forum to develop PRACE's working relations with Industry.

The 2012 event took place in Bologna in April 2012 and attracted a total of 96 attendees, including 67 non-PRACE attendees, and 30 speakers who provided 20 talks and 4 workshops.

30 of the companies attending were SMEs and 21 of them attended such an event for the first time. In total, the four industrial seminars to date have attracted as many as 120 different companies of various business and industrial profiles.

This is what some of the attendees of the previous events had to say:

- This seminar is a great opportunity to pull together the HPC community and facilitate exchanges and networking. The examples provided by Scania, GENCI, EPCC, Dompe where very interesting and educational.
- Excellent event. Very interesting to have a lot of real HPC cases during the presentation and to see the progress and the influence of PRACE in EU.
- Case History about real projects are for sure the most interesting part. Thanks for the organization. Good Job.

Seminar date and location

This event will take place in one of the most vibrant European industrial regions: Stuttgart. The city and its surroundings are home to a number of world-class companies e.g. in the automotive and mechanical engineering field.

Please visit the seminar home page www.prace-ri.eu/PRACE-Industrial-Seminar-2013 for additional information.

Competition for the Most Innovative Industrial HPC Application in Europe – Second Round – Stuttgart, April 15th and 16th, 2013

PRACE is also pleased to announce the second round of the **Competition for the Most Innovative HPC Industrial Solution** in Europe. As usual, this competition is open to all fields of HPC and all industrial sectors.

This year's competition targets end-user applications challenging the traditional way of doing business in Europe. We are looking for HPC solutions that address a specific business problem within the industrial environment of the applicant.

We welcome applications from industrial end-users who have implemented a compelling HPC solution that has changed the operational patterns of their business. More information will be available soon at www.prace-ri.eu/PRACE-Industrial-Seminar-2013

www.prace-ri.eu

e-infrastructure

PRACE receives funding from the EU's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° RI-261557, RI-283493 and RI-312763.

PRACE

PRACE (Partnership for Advanced Computing in Europe, www.prace-ri.eu) is a pan-European research infrastructure with an objective to provide world-class HPC systems for research and science in Europe. The mission of PRACE is to enable high-impact scientific discovery and engineering research and development across all disciplines in order to enhance European competitiveness. PRACE seeks to realise this mission through the provision of computing and data management resources implementedthrough a peer review process.

PRACE is as an international non-profit association with a seat in Brussels and asa 'Partnership for Advanced Computing in Europe AISBL'. It has 25 member countries (as of October 2012) whose representative organisations constituteits infrastructure. PRACE is funded by member governments through their representative organizations. The PRACE Projects are funded by the EU's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° RI-261557, RI-283493 and RI-312763. The first PRACE computer systems and their operations are funded by the governments of the representative organizations hosting the systems.

PRACE's Industrial Relations

PRACE is committed to building a successful relationship with European industry. As of now, our **Open Research Industrial Access Programme** allows **companies** to use PRACE's supercomputing resources in order to perform **open research** tasks requiring HPC applications.

PRACE is willing to share its resources and expertise with European companies in order to contribute to the competitiveness of our region. The creation of the **Industrial Advisory Committee** will enable Industry to advise PRACE on how to facilitate that process.

Also, PRACE is developing a Special Programme with the aim to help European SMEs to achieve tangible Return on Investment with the help of HPC. We will be able to provide an update on this development during the event.

Figure 11: "SAVE THE DATA" flyer announcing the Industrial Seminar

Brussels, February 19, 2013

5th PRACE Seminar for Industrial Users: HPC Changing Europe's Industrial Landscape, Stuttgart, 15/16th April 2012

Dear Sir or Madam,

High Performance Computing (HPC) is now as a key enabling technology for companies that intend to stay ahead of their competitors – both in developing innovative products and offering high-value services.

The research infrastructure Partnership for Advanced Computing in Europe (PRACE AISBL), an International Association registered in Belgium, with members in 25 European countries, is deploying a world-class HPC Infrastructure through a sustained program of investment in new HPC systems. Six Tier-0 systems, with a cumulated peak performance of 15 PFlop/s, are already available in France, Germany, Italy and Spain this year, offering high-end HPC services to European researchers, as a part of an initial investment plan of over 400M€from 2010 to 2015 completed by 130M€ provided by FP7 EU implementation projects and partners contributions.

PRACE is committed to support European industry competitiveness by providing access to HPC resources and services, in that sense PRACE organises its fifth Industrial Seminar in Stuttgart, Germany, building on the success of the previous seminars in Amsterdam, Toulouse, Stockholm and Bologna. To date, the PRACE Seminars have become one of the pillars of HPC development in Europe, attracting over 120 companies (e.g. Airbus, Repsol, ENI, Ferrari, EDF, Vestas and a large number of SMEs, e.g. Free Field Technology, Termofluids, HydrOcean, Numtech or Cenaero).

The seminar targets industrial users of HPC, who will have an opportunity to learn how PRACE resources, expertise, education and training can contribute to their business success. The seminar will act as a forum to develop or strengthen links with CEOs, CTOs, CIOs and R&D managers coming from large Corporations and SMEs, as well as Independent Software Vendors.

In particular, this event will provide an opportunity to elaborate on the industrial offer of PRACE. The PRACE Open R&D Access Programme, launched in 2012, now allows industrial users to avail of PRACE's resources to conduct industrial, open research based on a peer-review process. PRACE is committed to adapting this model to the needs of industry by implementing an SME support programme, an Industrial Advisory Committee and other initiatives. The event will serve as a forum to introduce and discuss these ideas.

At this seminar, PRACE will continue to award Europe's most innovative HPC application and we count on your participation in this competition.

On behalf of PRACE, I would like to cordially invite you to this event in order to discuss your HPC requirements and determine how our future services can provide value to your organisation.

HPC Changing Europe's Industrial Landscape
15th and 16th April 2013
Stuttgart, GERMANY

We would be grateful if you could reserve this date and confirm your attendance by sending an email to is2013-info@prace-ri.eu or visit: http://www.prace-ri.eu/PRACE-Industrial-Seminar-2013

Yours sincerely

Dr. Sergi Girona
Chairman of the Board of Directors of PRACE AISBL

PRACE AISBL - 98, Rue du Trône B -1050 Bruxelles Belgium
www.prace-ri.eu

Figure 12: The official invitation letter of Sergi Girona, Chairman of the Board of Directors of PRACE AISBL

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PRACE

PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE

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PRACE Awarded Projects
PRACE Peer Review
PRACE FP7 Projects and Outcomes
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PRACE Implementation Phases
DECI (Tier-1) Access
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PRACE Training Portal
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PRACE Industrial Seminar 2013

Wednesday 19 December 2012

5th PRACE Executive Industrial Seminar
HPC Changing Europe's Industrial Landscape

15th and 16th April 2013, Bad Boll, Stuttgart, Germany
A seminar designed for key decision makers in the area of modelling, numerical simulation and technology

In the times of increasing global economic challenges, PRACE Industrial Seminar is heading to the cradle of the European car industry, nowadays a well-known cluster of high-tech and engineering industry as well as academic and research organisations. The 5th PRACE Industrial Seminar will take place in Stuttgart, one of the most vibrant European industrial regions and home to a number of world-class companies. In Stuttgart, business meets the future.

High Performance Computing
European Commission
Europe's place in a Global Race

16 June 2013
PRACE SCIENTIFIC CONFERENCE 2013 at ISC'13

Call announcements
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PRACE News

Open e-IRG Workshop in Dublin on 22-23 May 2013
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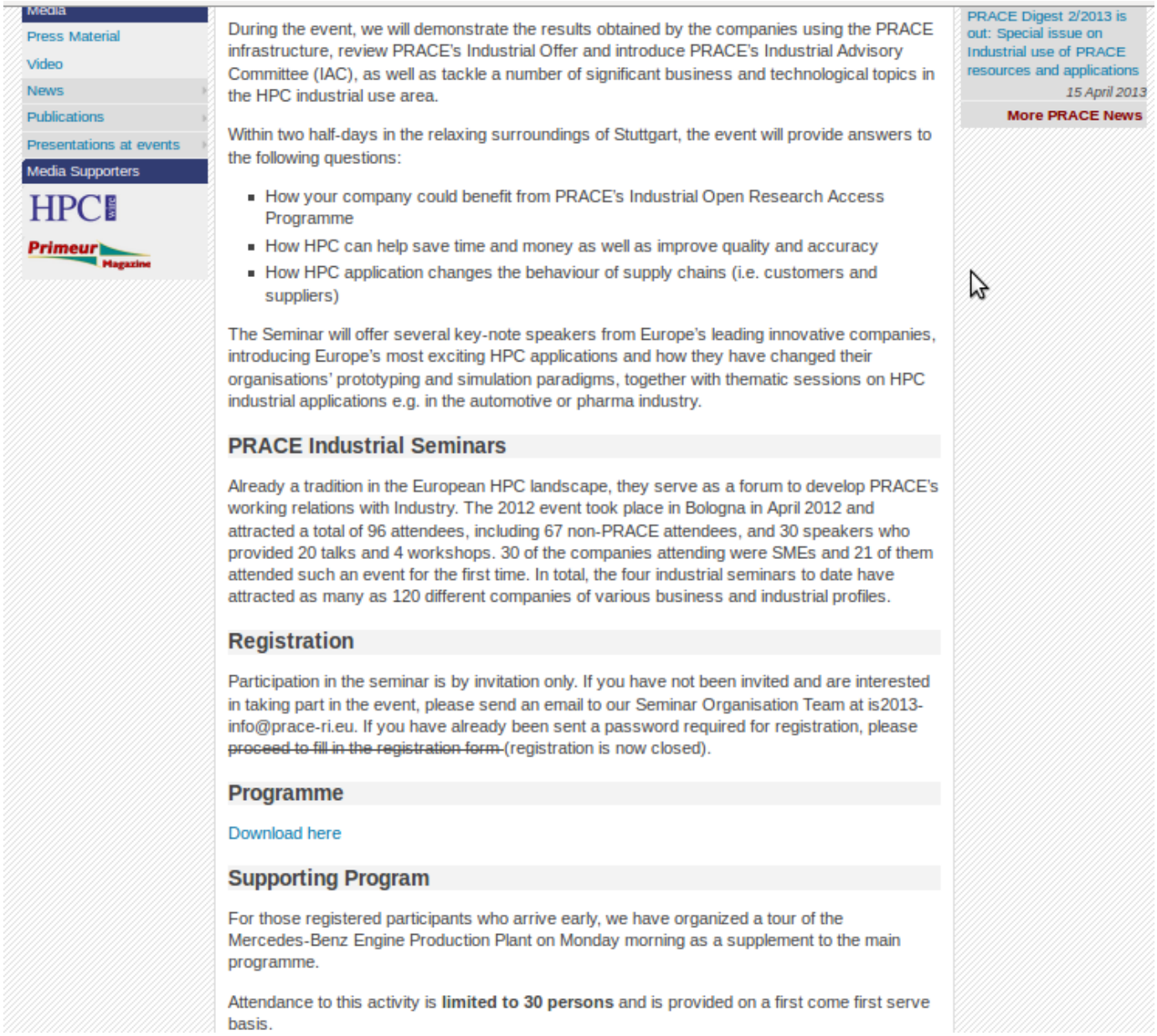
16 April 2013

PUMPS 2013: Programming and tUning Massively Parallel Systems Summer School
16 April 2013

PRACE Digest 2/2013 is



Media
Press Material
Video
News
Publications
Presentations at events
Media Supporters

During the event, we will demonstrate the results obtained by the companies using the PRACE infrastructure, review PRACE's Industrial Offer and introduce PRACE's Industrial Advisory Committee (IAC), as well as tackle a number of significant business and technological topics in the HPC industrial use area.

Within two half-days in the relaxing surroundings of Stuttgart, the event will provide answers to the following questions:

- How your company could benefit from PRACE's Industrial Open Research Access Programme
- How HPC can help save time and money as well as improve quality and accuracy
- How HPC application changes the behaviour of supply chains (i.e. customers and suppliers)

The Seminar will offer several key-note speakers from Europe's leading innovative companies, introducing Europe's most exciting HPC applications and how they have changed their organisations' prototyping and simulation paradigms, together with thematic sessions on HPC industrial applications e.g. in the automotive or pharma industry.

PRACE Industrial Seminars

Already a tradition in the European HPC landscape, they serve as a forum to develop PRACE's working relations with Industry. The 2012 event took place in Bologna in April 2012 and attracted a total of 96 attendees, including 67 non-PRACE attendees, and 30 speakers who provided 20 talks and 4 workshops. 30 of the companies attending were SMEs and 21 of them attended such an event for the first time. In total, the four industrial seminars to date have attracted as many as 120 different companies of various business and industrial profiles.

Registration

Participation in the seminar is by invitation only. If you have not been invited and are interested in taking part in the event, please send an email to our Seminar Organisation Team at is2013-info@prace-ri.eu. If you have already been sent a password required for registration, please ~~proceed to fill in the registration form~~ (registration is now closed).

Programme

Download here

Supporting Program

For those registered participants who arrive early, we have organized a tour of the Mercedes-Benz Engine Production Plant on Monday morning as a supplement to the main programme.

Attendance to this activity is **limited to 30 persons** and is provided on a first come first serve basis.

PRACE Digest 2/2013 is out: Special issue on Industrial use of PRACE resources and applications
15 April 2013
More PRACE News

Flyer

Download **here**.

Hotel Accommodation

Accommodation in the seminar hotel can be booked with the registration for the seminar. For more information, please go to the registration form link.

Venue

The seminar will take place in the suggestive atmosphere of Bad Boll at the edge of the Swabian Alb.

The seminar will open on April 15th at 12:00 and close on April 16th at 13:30. A lunch buffet will welcome participants on the 15th and will close the event on the 16th, offering a taste of the unique food and drink of Swabia.

A bus shuttle service from Stuttgart Airport to the venue will be organized for the seminar attendees.

Seminaris Hotel Bad Boll, Michael-Hörauf-Weg 2, 73087 Bad Boll

PRACE Open Competition 2013

PRACE continues its effort to identify the most innovative HPC application in Europe. The objective of this contest is to award the boldest industrial HPC end-user application – we want to see how far one can take this technology in changing the present paradigms of HPC use by European industry. As usual, this competition is open to all fields of HPC and industrial sectors and is not necessary to take part in the Seminar in order to enter this contest.

This year's competition (its second round) is open to end-user applications challenging the traditional way of doing business in Europe. We are looking for compelling HPC solutions submitted by industrial end-users that address a specific business problem within the industrial environment of the applicant, changing the operational patterns of their business.

For more information, please visit our Open Competition web page.

For questions and further information please contact us at:
is2013-info (at) prace-ri.eu

Attached documents

PRACE Industrial Seminar 2013 - Programme

6 March 2013
Document : PDF
83.5 kb

PRACE Industrial Seminar 2013 - flyer

19 December 2012
Document : PDF
1.1 Mb

Home page | Contact | Site Map | Statistics | visits: 360797

EN Events PRACE Industrial Seminars ? | OPML ?

Site created with SPIP 2.1.19 + AHUNTSIC

Figure 13: Webpage of the 5th Industrial Seminar 2013 (4 screenshots)

8.4 Seminar Location

The seminar took place in the Seminaris Hotel Bad Boll, approximately 30 km outside Stuttgart. Stuttgart, the capital city of Baden-Württemberg, is the industrial motor of Germany with headquarters of global players as Mercedes Benz, Porsche and Bosch. The southwest area of Germany is well connected with the high industrialized centers of middle Europe and can be reached within short time from Paris by direct TGV connection as an example for European cooperation.

The hotel was chosen because of its specialization on conference meetings. It offers about 20 seminar rooms with modern business technology, fair room prices and a good quality of international meal varieties for breakfast, coffee break and lunch. Although it was situated outside the city, the Programme Committee decided in favor of this hotel for the following reasons: to avoid the disadvantages of traffic and noise caused by the renovation and new building of the main train station, and the convenient price for a large conference area on two floors.

To reach the seminar location, a shuttle service for the participants from the main train station and the airport to the hotel has been provided. A very good shuttle company with modern and convenient cars was chosen for this service as they had provided the most cost-efficient proposal. Almost all attendees have been picked up by HLRS staff to make their arrival easier.

8.5 Social Events and Social Dinner

For the participants who arrived at the seminar early on Sunday afternoon a light welcome dinner was offered in the hotel. For Monday morning a guided tour to the Mercedes Benz engine plant in Stuttgart-Untertürkheim including a bus transfer from the seminar hotel to Mercedes Benz and back was scheduled. After arriving at the visitors' entrance at 10 a.m. the 28 attendees of the tour walked to a lecture hall on the factory site and listened to a half-hour presentation about Mercedes Benz, its structure and internal organization, future perspectives and general social and economic issues. Afterwards, the attendees visited the four-cylinder diesel engine plant for more than one hour and had the opportunity to carefully observe the robots manufacturing the engine blocks at the almost fully automatic production line. Thanks to the detailed pieces of information given by the Mercedes Benz staff member guiding the tour the attendees left the factory with a lot of valuable insights gained during this exciting morning.

After a busy first seminar day the attendees had the choice to visit the Museum Hauff of the Prehistoric World, the biggest private museum of its kind in Germany managed in the third generation as an example of private entrepreneurial spirit.

The social dinner was not held in the seminar hotel, but in a well-known typical Swabian and tweedy restaurant, where the attendees had the chance to get informally acquainted and talk about the perceptions they had won during the seminar work.

Figure 14: Coffee break in the Seminaris Hotel

9 Attendance

The seminar attracted 78 attendees from twelve countries. 58 of the attendees represented industrial or research/academic organizations not affiliated with PRACE. The graph below illustrates the countries of the attendees. Four registered attendees could not take part in the seminar because of injury (2) and personal reasons (2).

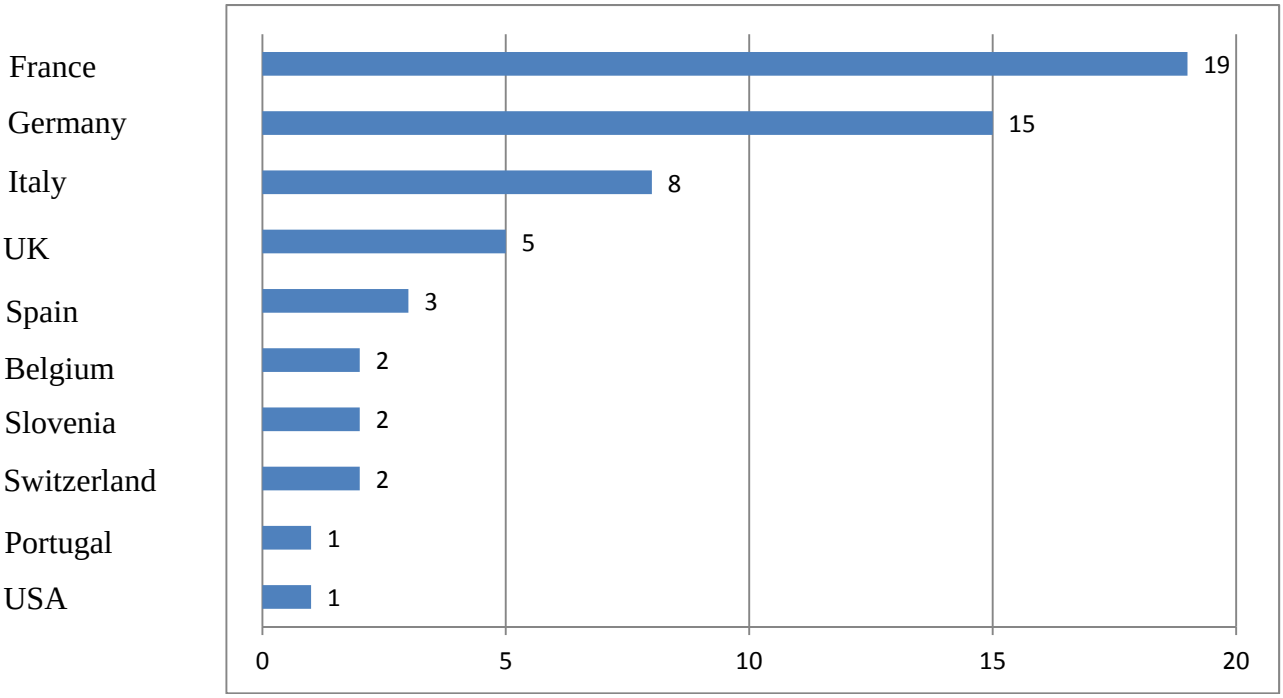


Figure 15: Distribution of the company countries of the non-PRACE attendees

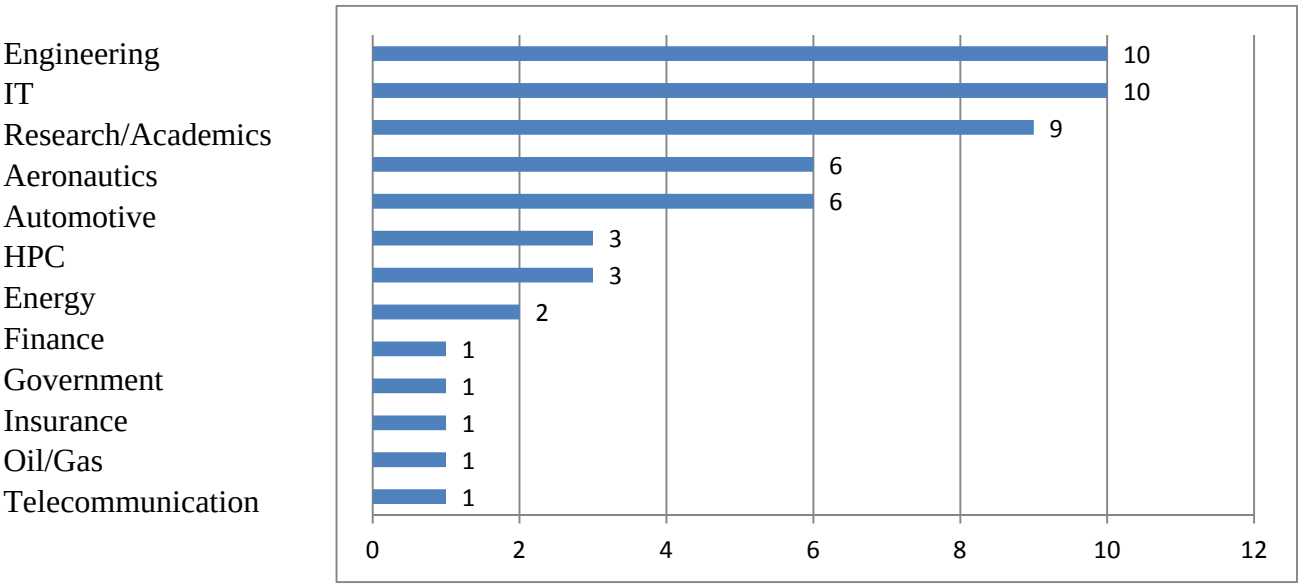


Figure 16: The industrial profiles of the attendees

Most of the industrial HPC users who attended the seminar were Engineering and IT companies, followed by Research /Academic organizations.

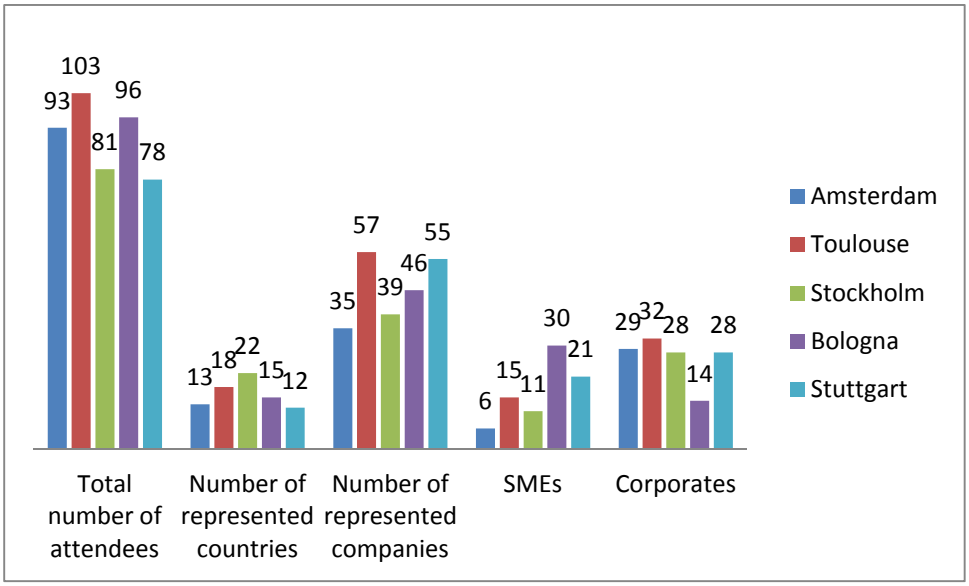


Figure 17: The evolution of attendee profiles at the five Industrial Seminars

Although the total number of attendees has decreased, the number of represented companies has grown clearly! The five Industrial Seminars organized by PRACE up to date have attracted about 142 different companies representing a wide range of industrial sectors and company profiles.

10 Feedback from attendees

The seminar team had prepared an evaluation form available on the internet at the following address:

https://www.surveymonkey.com/s/CQYJXZQ

A request to complete this form was sent to the 58 non-PRACE attendees and 25 responses were received (43.1%).

In overall, attendees' feedback is **overwhelmingly positive** with 54.2% of them stating that the event was 'Productive' and 45.8% stating that it was 'Very productive'. This is a better result than for the last year's seminar in Bologna!

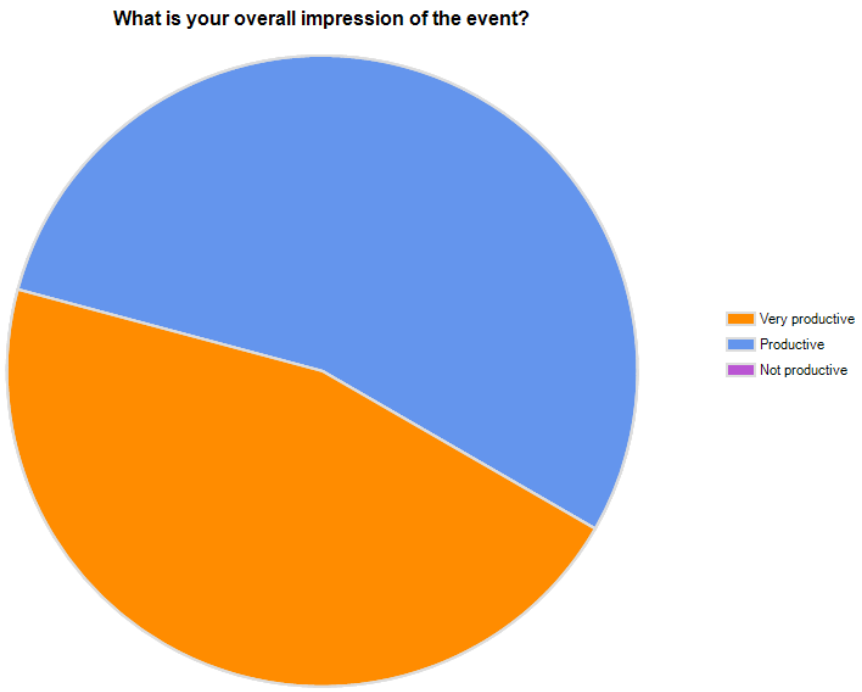


Figure 18: "What is your overall impression of the event?" - Answers

Most respondents rate the various components of the event as 'Good'. The 'Relevance of topics discussed' and the 'Speakers' have received the highest proportion of 'Excellent' answers (40.0%). The 'Agenda' received the most 'Below expectation' answers (12.0%).

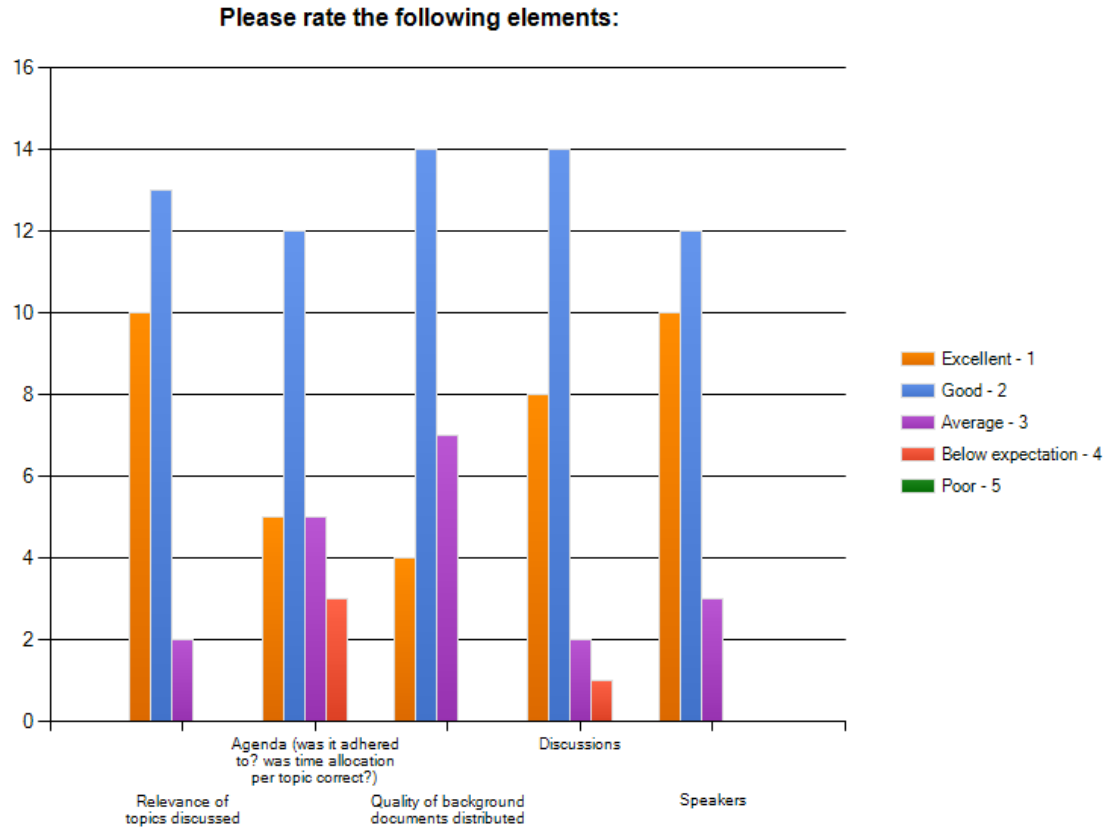


Figure 19: Evaluation of the various elements of the event

Overall, the organisation of the event has received a higher number of 'Excellent' ratings than the issues displayed in Figure 19. The respondents highly rate 'Support from organising staff' as well as 'Evening dinner and social event'. According to one respondent, the 'Conference facilities' and the 'Hotel' were below expectation. The issue 'Quality of the background documents' received the lowest mark. The outstanding result for 'Support from organising staff' (84.0% 'Excellent' and 16% 'Good') showed a significant improvement compared to the previous event.

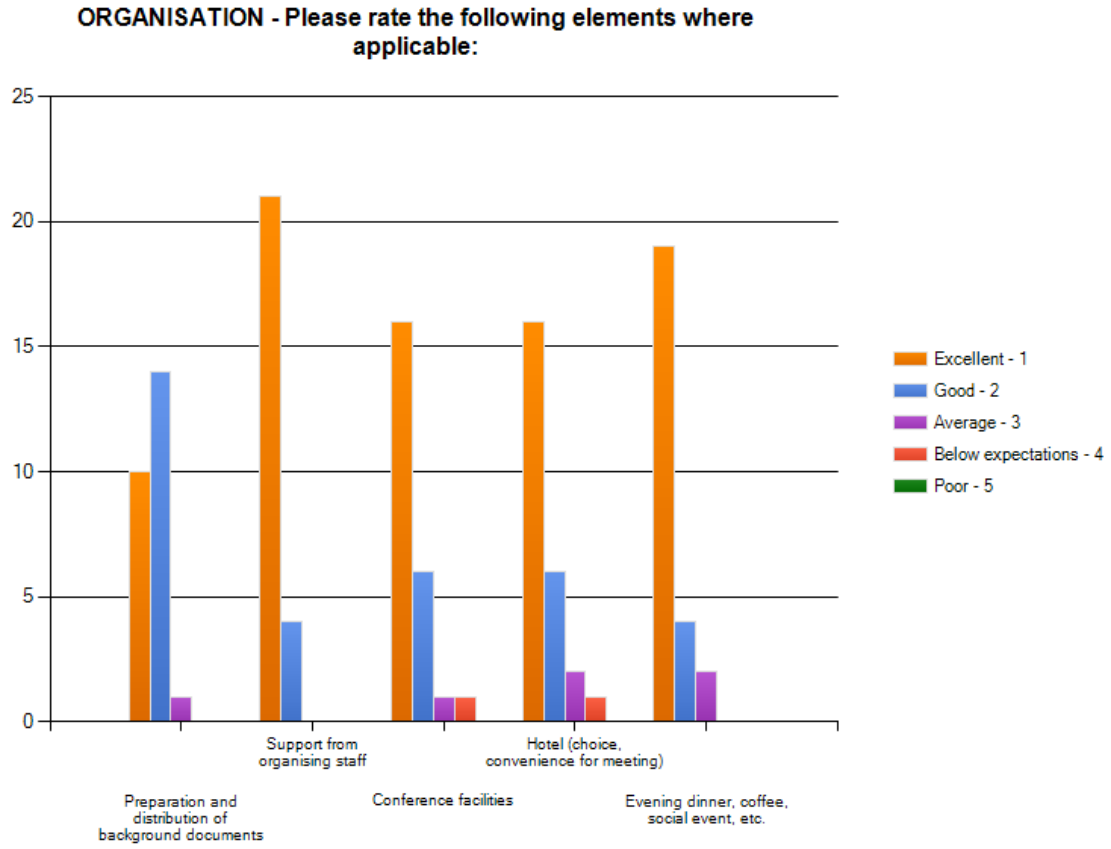


Figure 20: Evaluation of the event's organization

Eight comments were given at the survey:

- Very interesting conference, high level discussions.
- Congratulations, very good organization.
- These seminars are very productive for our organization in order to obtain feedback from other companies and expand our network.
- Some interesting comments were highlighted during the presentations and round-tables. It would be nice to write down at least some of them (e.g. conference wiki-page)
- I think the time dedicated to the parallel session and the organization of the discussion was not very productive and I have been extremely surprised to listen to a wrap up of that discussion at the end of the seminar. I fear they become some kind of input for strategic decision while they are not reflecting necessary the reality. I would have preferred a kind of two hours workshop with a moderator and each participant to describe for five minutes his own HPC reality and "dreams". This would generate a discussion and confrontation to answer some questions and reach some objective to be

defined by PRACE with the production of a final document that could become a serious source of inspiration. I belong to a large organization but my HPC reality is very far from the HPC reality of the automotive or aeronautic industry for example. I almost feel closer to SME situation...

- Sir, I think that PRACE contributions should be more focused in future events. Sometimes I've had the feeling that PRACE members of different origins speaking formally about the same did not mean it that way. The abstracts could be organized the same way as the speakers speak. (email-)addresses/contact details would also be a plus. Otherwise: Keep it up! Thank you very much for the stimulating time!
- Being in Germany I am a little bit disappointed by the delay and the little respect of time schedule :-)
- The seminar was very well organized. Anyway, it's a pity that the "PRACE technology watch" presentation had to be shortened to respect the time schedule at the end of the first day.

11 Communication after the event

Articles about the Seminar will appear in the PRACE Newsletter and the magazine INSIDE edited by the three German High Performance Computing Centers (both not available yet at the time of writing this document).

12 Acknowledgements

The Seminar Programme Committee would like to thank the HLRS for hosting the event. It would also like to acknowledge the contribution of all the speakers, both from industry and academia.

13 Annex

13.1 List of attendees

The attendees of the 5th PRACE Industrial Seminar are listed in Table 1.

First Name	Last Name	Industrial Sector	Organization/Company
Pedro	Alberto	PRACE	Universidade de Coimbra
Claudio	Arlandini	PRACE	CINECA
Frank	Baetke	IT-Vendor	HP
Florian	Berberich	PRACE	Forschungszentrum Jülich
Lluis	Biscarri	IT	Biscarri Consultoria SL
Jan	Blickwede	Automobile	Volkswagen AG
Patrick	Blouet	Engineering	STMicroelectronics
Thomas	Bönisch	PRACE	High Performance Computing Center Stuttgart (HLRS)
Ricard	Borrell	Engineering	Termo Fluids S.L.
Norbert	Bourneix	Aeronautics	IT-IS / Safran-Group
Daniele	Bucci	Engineering	Lapcos Scrl
Eva	Casoni	PRACE	Barcelona Supercomputing Center
Alessandro	Chiarini	IT	SCS Srl
Bruno	Conche	Oil / Gas	Total Exploration Production
Stefano	Cozzini	HPC-Vendor	eXact Lab srl
Philippe	David	Engineering	Sciences Computer Consultants
Luca	Degano	IT-Vendor	Eurotech SPA
Patrick	Donath	Research / Academics	Renater
Ralph	Eisenschmid	Pharma	Optima Pharma GmbH
Giovanni	Erbacci	PRACE	CINECA
Leonardo	Flores Anover	Government	European Commission
Vincent	Galinier	Aeronautics	Airbus
Albrecht	Gehring	Automobile	Lauer & Weiss GmbH
Alfred	Geiger	Telecom	T-Systems
Sergi	Girona	PRACE	PRACE
Michael	Gleaves	Research	Science & Technology Facilities Council
George	Graham	Research / Academics	EPCC University of Edinburgh
Paul	Graham	PRACE	EPCC University of Edinburgh
Bärbel	Grosse-Wöhrmann	PRACE	High Performance Computing Center Stuttgart (HLRS)
Christoph	Gümbel	Automobile	Porsche

First Name	Last Name	Industrial Sector	Organization/Company
Mohammed-Ali	Hamdi	IT	ESI-Group
Veit	Haug		Economic Development Region Stuttgart
Koen	Hillewaert	Engineering	Cenaero
Yoon	Ho	Automobile	Rolls-Royce PLC
Michael	Hoffmann	IT	Altair
Alexander	Hofmann	Engineering	Umicore AG & Co. KG
Nick	Holway	Pharma	Novartis
Tomi	Ilijas	HPC-Vendor	Arctur d.o.o.
Erwan	Jacquin	Engineering	HydrOcean
Daniel	Jana	Research / Academics	Ecole Polytechnique Federale de Lausanne
Andrew	Jones	Engineering	NAG
Tomas	Karasek	PRACE	VSB-TU Ostrava, IT4Innovations
Norbert	Kroll	Aeronautics	German Aerospace Center (DLR)
Nicolas	Lamarque	Automobile	Continental Automotive France
Jean-Francois	Lavignon	IT-Vendor	Bull
Jean-Marie	Le Gouez	Aeronautics	Onera
Andreas	Liehr	Energy	EnBW
Luigi	Locatelli	Engineering	Altair
Stoyan	Markov	PRACE	National Center for Supercomputing Applications
Klaus	Mauch	IT	Insilico Biotechnology
Christine	Menache	Research / Academics	CEA
Nicolas	Mignerey	PRACE	GENCI
Bijan	Mohammadi	Research / Academics	CERFACS
Marc	Morere	Aeronautics	Airbus
Guillaume	Mougin	Engineering	Air Liquide
Jean-Yves	Noel	Engineering	Electrolux Italia Spa
Jutta	Oexle	PRACE	High Performance Computing Center Stuttgart (HLRS)
Marcin	Ostasz	PRACE	Barcelona Supercomputing Center
Luigi	Perna	HPC	Enginsoft
Olivier	Pironneau	Research / Academics	LILL – University Pierre et Marie Curie
Stephane	Requena	PRACE	GENCI
Michael	Resch	Research / Academics	High Performance Computing Center Stuttgart (HLRS)
Philippe	Ricoux	Oil / Gas	Total SA

First Name	Last Name	Industrial Sector	Organization/Company
Catherine	Riviere	PRACE	GENCI
Jose Carlos	Sancho	Research / Academics	Barcelona Supercomputing Center
Manuel	Severiano	IT	Data Identity
Florian	Seybold	PRACE	High Performance Computing Center Stuttgart (HLRS)
Pierre	Spatz	Finance	Murex
Marco	Stenta	Pharma	Syngenta Crop Protection
Marco	Stupazzini	Insurance	Munich Re
Suzy	Tichenor	Research / Academics	Oak Ridge National Laboratory
Yves	Tourbier	Automobile	Renault
Beppe	Ugolotti	Aeronautics	NICEsrl
Gregor	Veble	Aeronautics	Pipistrel d.o.o. Ajdovscina
Claire	Waast-Richard	Energy	EDF R&D
Thomas	Weitzel	PRACE	High Performance Computing Center Stuttgart (HLRS)
Andreas	Wierse	IT	SICOS BW GmbH
Torsten	Wilde	PRACE	LRZ

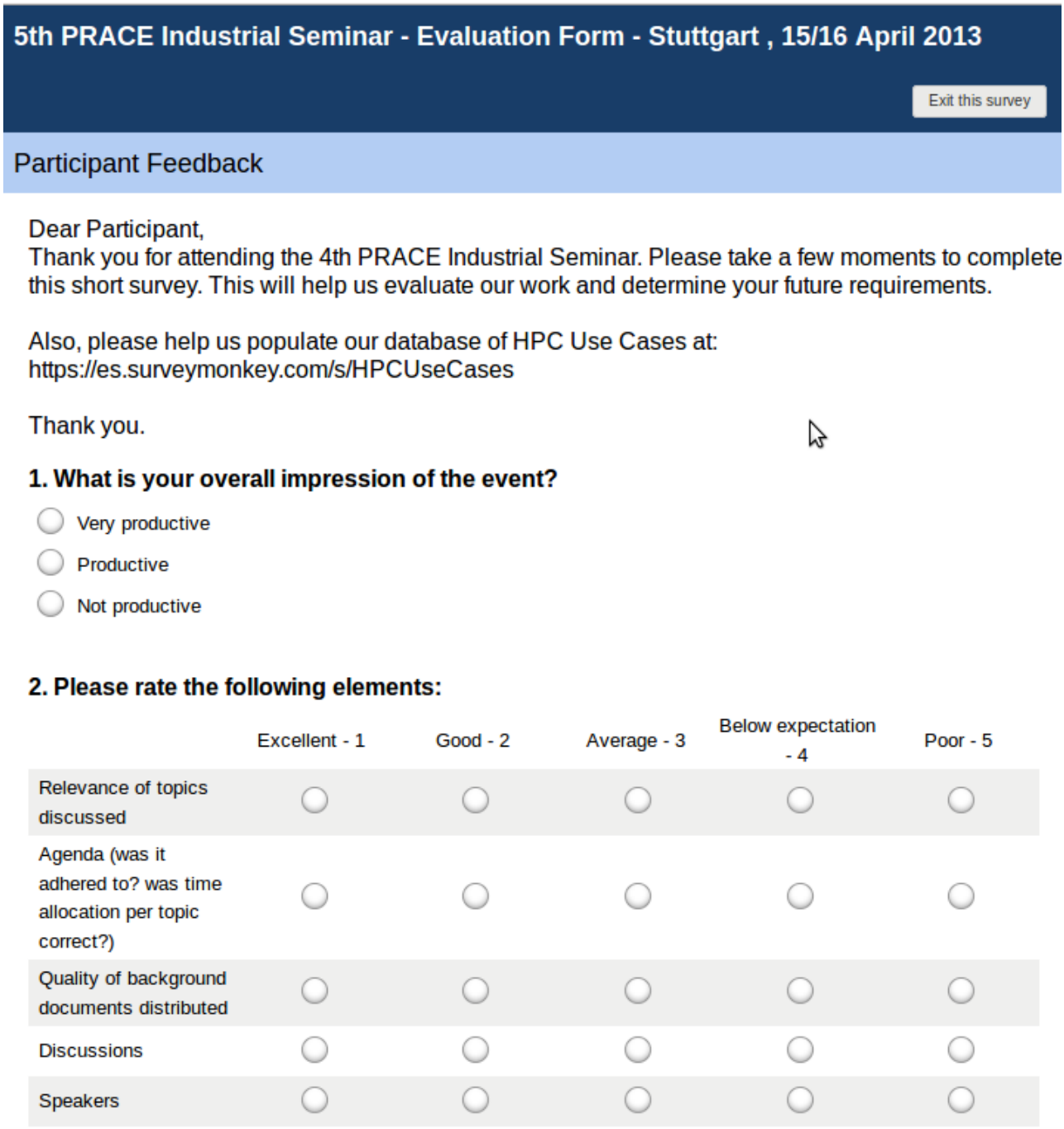
Table 1: List of attendees

13.2 Survey

These survey questions were to be filled in by the participants at

https://www.surveymonkey.com/s/CQYJXZQ

after the Seminar.



5th PRACE Industrial Seminar - Evaluation Form - Stuttgart , 15/16 April 2013

Exit this survey

Participant Feedback

Dear Participant,
Thank you for attending the 4th PRACE Industrial Seminar. Please take a few moments to complete this short survey. This will help us evaluate our work and determine your future requirements.

Also, please help us populate our database of HPC Use Cases at:
https://es.surveymonkey.com/s/HPCUseCases

Thank you.

1. What is your overall impression of the event?

- Very productive
- Productive
- Not productive

2. Please rate the following elements:

	Excellent - 1	Good - 2	Average - 3	Below expectation - 4	Poor - 5
Relevance of topics discussed					
Agenda (was it adhered to? was time allocation per topic correct?)					
Quality of background documents distributed					
Discussions					
Speakers					

3. ORGANISATION - Please rate the following elements where applicable:

	Excellent - 1	Good - 2	Average - 3	Below expectations - 4	Poor - 5
Preparation and distribution of background documents	○	○	○	○	○
Support from organising staff	○	○	○	○	○
Conference facilities	○	○	○	○	○
Hotel (choice, convenience for meeting)	○	○	○	○	○
Evening dinner, coffee, social event, etc.	○	○	○	○	○

4. Comments:

5. Please provide your name:

6. Please provide your email address:

7. Please provide the name of your organisation:

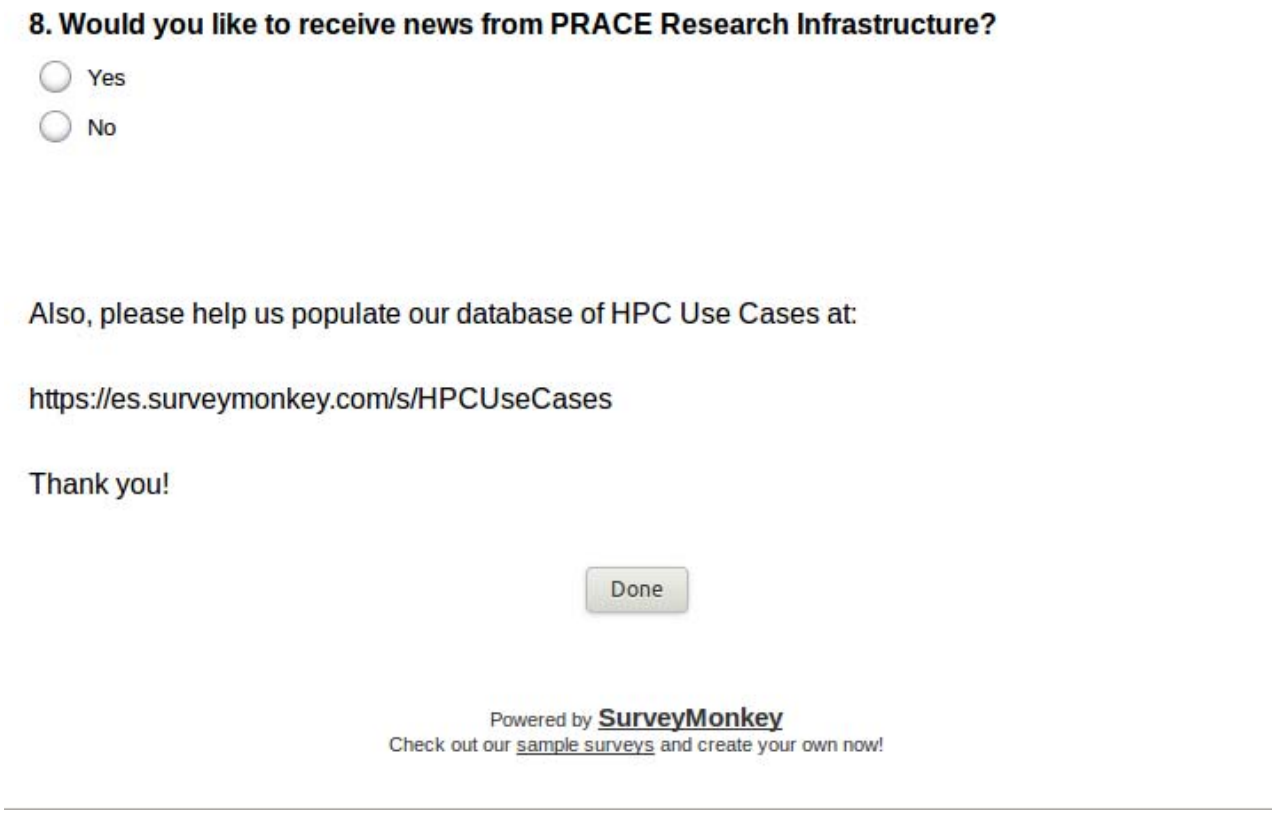


Figure 21: The questionnaire at SurveyMonkey (3 screenshots)

13.3 Abstracts

The abstracts of the talks and the parallel sessions of the PRACE Executive Industrial Seminar 2013 can be found below.

Leonardo Flores Anover, EU: "The EU HPC Strategy"

The most powerful supercomputers are needed to address scientific and societal grand challenges like understanding the human brain or climate change. Industry increasingly needs HPC to innovate in products and services. Further, many technologies developed for leading-edge HPC find their way to consumer products within 5 years or so, with evident benefits for those that developed them.

In Europe we have both the technological know-how and market size to be a global player. The Commission recognized the importance of HPC in its Communication "High Performance Computing: Europe's place in a Global Race". This is an integrated strategy that combines three elements: (a) developing the next generations of HPC towards exascale; (b) providing access to the best facilities and services for both industry and academia; and (c) achieving excellence in HPC applications. These three elements are not independent and should work in synergy.

The Commission has proposed an ambitious programme reflecting the Union's support to research and innovation for the coming years. This programme covers Research, Technological development, demonstration and innovation for the 7 year period (2014-2020). We expect that the support to the HPC strategy will be properly reflected in the Horizon 2020 programme.

M. Stupazzini, Munich Re: "Deterministic modelling of 3D seismic scenarios: when technical challenge meets industry requirements"

Recent earthquakes, such as Maule (Chile, 2010), Christchurch (New Zealand, 2010 and 2011), Tohoku (Japan, 2011), up to the Emilia-Romagna seismic sequence (Italy, 2012) have shown that use of ground motion prediction equations (GMPE) to produce deterministic earthquake ground motion scenarios may produce inaccurate results for a number of different reasons, such as: (i) large magnitudes, at the limit, or beyond, the range of calibration of GMPEs; (ii) near-field conditions and deep soil sediments, still poorly constrained by a sufficient number of records.

Although these earthquakes provided a large amount of records that will be of paramount usefulness to improve the previous limitations of GMPEs, alternative approaches, based on the extensive use of 3D numerical simulations of seismic wave propagation, including kinematic models of the seismic source and the propagation path through heterogeneous soil layers, are becoming more and more appealing, owing to the ever increasing computational power of parallel computer architecture.

To make feasible such an approach for seismic risk management, a joint programme of cooperation between Politecnico di Milano and MunichRe with the following objectives. First, to develop a high performance open-source spectral element computer code (SPEED), based on a discontinuous Galerkin formulation, suitable to construct non-conforming numerical models for multi-scale seismic wave propagation analyses. Second, to apply such numerical code to perform extensive parametric seismic scenario studies in large urban environments in the vicinity of seismic faults.

In this presentation we will summarize the progress of this cooperative research programme, which, besides the significant theoretical and computational effort to develop the new SPEED code, has found its first applications to the case studies of Santiago de Chile and Christchurch. Numerical shaking maps from these case histories will be illustrated and compared with the observed ones and those provided by more standard applications of GMPEs.

Suzy Tichenor: "Accelerating Competitiveness with Leadership Computing"

Modeling and simulation with leadership computing is transforming industrial science and engineering, dramatically accelerating the process of innovation and understanding. From modeling of combustion for advanced engines, to designing bio-inspired catalysts for renewable energy, or using very high resolution CFD to optimize turbomachines, companies are reducing time-to-insight and time-to-market, and realizing bottom line results.

This presentation will discuss The Oak Ridge HPC Industrial Partnerships Program, which helps companies gain access to Titan, the most powerful supercomputer in the world for open-science (#1 on the Top 500 list), as well as to world class expertise. Because of these resources, large and small companies are bringing some of their most challenging problems to the Oak Ridge Leadership Computing Facility. These are the problems whose solutions can provide pioneering breakthroughs and competitive leaps, but are too large or too time consuming to tackle on a firm's in-house system.

Jean-Francois Lavignon, ETP4HPC

The ETP4HPC (European Technology Platform for High Performance Computing) has been created to represent the European HPC technology research stakeholders. This ETP has issued a Vision Paper and a Strategic Research Agenda in the field of HPC technology.

The talk will present the actions of the platform and especially the status of the discussions with the European Commission and the recommendations of the Strategic Research agenda.

Panel session: Open Source in Industry

In this session we will discuss the advantages and disadvantages of using open source software in industry: Why using open source? What about the validation of the results? Where can I get support?

Two speakers, D. Bucci and M. Stenta, will briefly introduce their companies and tell us about their experiences with OpenFOAM, a CFD software package, and AutoDock Vina designed to predict how small molecules bind to a receptor of known 3D structure and its parallel version VinaLC.

We will have a final discussion together with all of you on how businesses can successfully incorporate such models.

On the panel:

- Paul Graham (chair)
- Bärbel Große-Wöhrmann (co-chair)
- Daniele Bucci, LAPCOS, Italy
- Marco Stenta, Syngenta, Switzerland

Parallel session: PRACE Technology Watch

Chair: P. Alberto

This session will provide an overview of the PRACE efforts in the technical evaluation of prototype computing platforms together with the port of necessary system software and programming environments to those platforms. The second part will cover the area of Novel Programming Techniques. This includes the development of auto-tuning runtime environments, the exploration of new scalable numerical algorithms and the development of technologies to help programmers to accelerate the process of application porting.

R. Borrell, Termo Fluids S.L.: PRACE PROJECT: Broadening the scalability of TermoFluids code

Termo Fluids S.L. benefited from PRACE Tier-0 computational resources within the project "Broadening the scalability of TermoFluids code". This project was focused on the optimization of the company's simulation software, being its main instrument for its scientific consulting services. Termo Fluids S.L provides design optimization and engineering analysis services for industries from different areas such as the renewable power generation, thermal equipment, HVAC and refrigeration or automotive.

This project had two independent objectives. The first one was to optimize the parallelization strategy for the resolution of multi-fluid flows. This type of heterogeneous flows is present in many industrial processes. Examples are fluid-fuel interaction in enhanced oil extraction, injection in combustion engines, mixture of polymers or emulsions in food products. When the interaction between immiscible fluids, the solution process is based on an interface tracking algorithm. In this context, standard domain decomposition approaches generally result into unbalanced load distributions. Therefore, the aim of this project has been to develop dynamic load balancing strategies to overcome this limitation. As a result, accurate low cost approximations to this hard NP-complete balancing problem were found. Numerical experiments were performed in TGCC Curie FAT nodes attesting the advantages of these new strategies.

The second goal was the acceleration, via GPU co-processors, of the parallel linear solvers required to solve the systems derived from the discretization of the governing equations. Solvers of linear systems are the core of the numerical simulation codes and represent most part of the computing costs. In particular, the attention was focused on the acceleration of the preconditioned conjugate gradient method (PCG) that is one of the most prominent iterative solvers. Multiple CPU-cores and GPUs were simultaneously engaged by means of an MPI+CUDA model, using a data transfer overlapping approach in order to minimize the communication expenses. The assessment of the different algorithms considered was performed in the TGCC Curie hybrid nodes and the resulting MPI+CUDA based implementation significantly outperformed the initial MPI-only code.

Alessandro Chiarini, Medtronic: The RT3S Project: towards safer vascular stenting

Medtronic (NYSE:MDT) is the world leader in medical device manufacturing with a revenue of 16B$ and 45000 employees worldwide. One of the fastest growing business units is peripheral vascular stenting which involves a particular medical device called stent. A stent is a self-expandable implantable medical device that is manufactured with a special Titanium alloy called Nitinol. Nitinol has a highly nonlinear mechanical behavior which features the possibility to have a non-expanded and expanded configuration. If during peripheral endovascular treatment a stent is placed with a catheter in the superior femoral artery, the

mechanical solicitation due to lower limb motion applied to the stent might lead to fatigue fracture which is the most frequent cause of device failure. The aim of the RT3S project which involves, together with Medtronic Italy, ANSYS, POLIMI and SCS-CINECA is to provide a technology based on computation of mechanical simulations on a HPC infrastructure to evaluate the risk of fracture by device and stenosis parameterization that might be used to design a new generation of safer devices.

Parallel session: HPC in Automotive Industry

Chair: T. Bönisch

This session will present the state-of-the-art of using HPC in the automotive industry. Yves Tourbier, Renault, will give an overview of their recently granted PRACE project. An introduction to HPC at Volkswagen will be provided by Jan Blickwede in the second talk. Composite materials in motorsports and the role of HPC in Dallara's development process are the topics of Michael Hoffmann. The last presentation in this session by Albrecht Gehring, Lauer & Weiss, will give insight into the HPC usage of an SME engineering company.

Parallel session: HPC in Aerospace Industry

Chair: N. Mignerey

The goal of this parallel session is to give a comprehensive view of the use of HPC in aeronautics, one domain that embraced HPC quite early and deeply. Through speakers from different companies, we will understand how essential the HPC tool has become to the industry, and what the technical and scientific challenges that lie ahead are. A specific emphasis will be put on the adoption of HPC by small and medium-size companies in this field, as big companies are pushing to promote HPC in the whole value chain.

Presenters:

- G. Veble, Pipistrel, Slovenia: “Use of high performance computing for high efficiency aerodynamic design”
- N. Kroll, German Aerospace Center (DLR): “Role of HPC in Aircraft Design”
- Y. Ho, Rolls-Royce: “HPC & Simulation Based Engineering Designs: current capabilities & future challenges”

Parallel session: Emerging Applications

Chair: C. Arlandini

In this session a number of emerging applications, typically open source, of high potential impact on industrial research and innovation are presented. These applications, not yet ready for industrial production, were selected by PRACE through an open process, collecting inputs from both industry and academia to evaluate the most promising ones both in terms of industrial interest and HPC challenge. PRACE experts are working in close collaboration with code owners and committed industrial users on performance analysis, scaling, code optimization, and validation. The aim of this effort is that each of these applications may become the nucleus for a business opportunity for a spin-off or an SME to create an industrial strength offering.

Applications to be presented:

- C. Arlandini: **Ontonix**
- C. Arlandini: **ViscoSolve**, a Viscoelastic Fluid Flow Code
- E. Casoni: **Alya-SOLIDZ**, a massively parallel solid mechanics solver in Alya.
- S. Requena: **URANIE**

Parallel session: Requirements of & Programme Access for Large Companies

Chair: P. Graham, S. Requena

In this session, PRACE staff will introduce the current opportunities for large companies to make use of PRACE resources. In addition, Alfred Geiger, T-Systems will provide his view of the requirements of large companies using HPC and the necessary services. In the following discussion, PRACE staff would like to learn how industry would like to access leadership class HPC systems, how potential usage models could look like and how future collaborations might be possible.

Parallel session: Requirements of & Programme Access for SMEs

Chair: M.Ostasz

Here, PRACE will provide an overview of the planned SHAPE programme which aims to support SMEs in using European Tier-0 and Tier-1 HPC systems. In addition, several speakers from SMEs will give their view of the special requirements of SMEs interested in using this class of systems. In the discussions, PRACE staff would like to collect input from the attendees for the final shaping of the SHAPE programme and for the deployment of the first pilot projects.