SEVENTH FRAMEWORK PROGRAMME
Research Infrastructures

INFRA-2007-2.2.2.1 - Preparatory phase for 'Computer and Data Treatment' research infrastructures in the 2006 ESFRI Roadmap

PRACE

Partnership for Advanced Computing in Europe

Grant Agreement Number: RI-211528

D3.1.6
Proceedings of First Scientific Conference

Final

Version:	1.0
Author(s):	Tim Robinson, CSCS and Anni Jakobsson, CSC
Date:	17.12.2008

Project and Deliverable Information Sheet

PRACE Project	**Project Ref. №: RI-211528**	
	Project Title: Partnership for Advanced Computing in Europe	
	Project Web Site: http://www.prace-project.eu	
	Deliverable ID: D3.1.6	
	Deliverable Nature: Report	
	Deliverable Level: PU *	**Contractual Date of Delivery:** 31 / December / 2008
		Actual Date of Delivery: 31 / December / 2008
	EC Project Officer: Maria Ramalho-Natario	

* - The dissemination level are indicated as follows: **PU** – Public, **PP** – Restricted to other participants (including the Commission Services), **RE** – Restricted to a group specified by the consortium (including the Commission Services). **CO** – Confidential, only for members of the consortium (including the Commission Services).

Document Control Sheet

Document	**Title:** Proceedings of First Scientific Conference	
	ID: D3.1.6	
	Version: 1.0	**Status:** Final
	Available at: http://www.prace-project.eu	
	Software Tool: Microsoft Word 2003	
	File(s): PraceDeliverableTemplate.doc	
Authorship	**Written by:**	Tim Robinson, CSCS and Anni Jakobsson, CSC
	Contributors:	
	Reviewed by:	Norbert Eicker, FZJ, Florian Berberich, JSC
	Approved by:	Technical Board

Document Status Sheet

Version	Date	Status	Comments
0.1	27/November/2008	Draft	Tim Robinson CSCS, Anni Jakobsson CSC
0.2	16/December/2008	Draft	Norbert Eicker, FZJ, Florian Berberich, JSC
1.0	17/December/2008	Final	

Document Keywords and Abstract

Keywords:	PRACE, HPC, Research Infrastructure
Abstract:	The first PRACE Scientific Conference was held on 26 November 2008 in Lyon, organized alongside ICT 2008, the largest research event for information and communication technologies in Europe. Over 40 participants from 16 countries attended the sessions aimed at facilitating discussion and collaboration between researchers, technical experts, and policy makers, towards PRACE's goal of establishing an HPC infrastructure in Europe. By organising the workshop during ICT 2008, PRACE was able to connect closely with other European ICT projects, such as DEISA and EGEE, enhance collaboration and identify areas of overlapping effort. In this way the workshop has contributed to WP2's efforts towards the development and promotion of a PRACE stakeholders' network. A second scientific conference is being organized in conjugation with the DEISA Symposium, to be held in Amsterdam in May 2009.

Copyright notices

© 2008 PRACE Consortium Partners. All rights reserved. This document is a project document of the PRACE project. All contents are reserved by default and may not be disclosed to third parties without the written consent of the PRACE partners, except as mandated by the European Commission contract RI-211528 for reviewing and dissemination purposes.
All trademarks and other rights on third party products mentioned in this document are acknowledged as own by the respective holders.

Table of Contents

Project and Deliverable Information Sheet ii
Document Control Sheet ii
Document Status Sheet ii
Document Keywords and Abstract iii
Table of Contents iv
List of Figures iv
References and Applicable Documents v
List of Acronyms and Abbreviations v
Executive Summary 1
1 Introduction 2
2 Motivation and venue 3
3 Advertising 3
3.1 Press releases 3
3.2 Website 4
3.3 Flyer 4
3.4 Final Programme and speaker biographies 4
4 Attendees 5
5 Event 6
5.1 Networking session at ICT 2008 6
5.1.1 Agenda 6
5.1.2 Presentations and discussion 7
5.2 Evening session at Hotel de la Cité Concorde 8
5.2.1 Agenda 8
5.2.2 Presentations and discussion 8
5.3 Summing up dinner 9
6 Feedback 10
7 Conclusions and future plans 11
7.1 Dissemination 11
7.2 Second scientific conference 11
7.2.1 Proposed agenda 11
8 Annex I: List of Attendees (registered and casual) 13
9 Annex II: Programme, abstracts and speaker biographies 15

List of Figures

Figure 1: An article published in The Parliament Magazine's November issue of Research Review 4
Figure 2: The conference flyer 6

References and Applicable Documents

[1] http://www.prace-project.eu
[2] http://www.prace-project.eu/news/prace-hosts-scientific-workshop-during-ict-2008
[3] http://www.prace-project.eu/documents/press-releases-pdfs/prace_workshop_lyon_pr.pdf
[4] http://www.prace-project.eu/documents

List of Acronyms and Abbreviations

DEISA	Distributed European Infrastructure for Supercomputing Applications. EU project by leading national HPC centres.
EGEE	Enabling Grids for E-sciencE; EU Grid project lead by CERN and successfully completed in 2004. Follow-up is EGEE-II.
ESFRI	European Strategy Forum on Research Infrastructures; created roadmap for pan-European Research Infrastructure.
HET	High Performance Computing in Europe Taskforce. Taskforce by representatives from European HPC community to shape the European HPC Research Infrastructure. Produced the scientific case and valuable groundwork for the PRACE project.
HPC	High Performance Computing; Computing at a high performance level at any given time; often used synonym with Supercomputing.
HPC-Europa	Consortium of six leading (HPC) infrastructures and five centres of excellence providing transnational access; EU project.
ISC	International Supercomputing Conference; European equivalent to the US based SC0x conference. Held annually in Germany.
PRACE	Partnership for Advanced Computing in Europe; Project Acronym.
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.
UNICORE	Uniform Interface to Computing Resources. Grid software for seamless access to distributed resources.

Executive Summary

The first PRACE Scientific Conference was held on 26 November 2008 in Lyon, organized alongside ICT 2008, the largest research event for information and communication technologies in Europe. The programme was focussed on the themes of applications, architectures and training needs for the petascale regime, covering these topics from multiple perspectives – from the policy maker to the application scientist.

Over 40 participants from 16 countries attended the sessions aimed at facilitating discussion and collaboration between researchers, technical experts, and policy makers, towards PRACE's goal of establishing an HPC infrastructure in Europe. By organising the workshop during ICT 2008, PRACE was able to connect closely with other European ICT projects, such as DEISA and EGEE, enhance collaboration and identify areas of overlapping effort. In this way the workshop has contributed to WP2's efforts towards the development and promotion of a PRACE stakeholders' network. A second scientific conference is being organized in conjugation with the DEISA Symposium, to be held in Amsterdam in May 2009.

The conference was successful in showcasing PRACE in the context of other European ICT projects and demonstrating its fundamental role in the creation of a persistent HPC Ecosystem in Europe. It was less successful, however, in bridging the gap between the PRACE project and the academic community – the very community on which its scientific case is drawn, and where the success of the PRACE Initiative will ultimately be measured. To address this problem the authors propose an increase in the visibility of PRACE at the scientists' own conferences, i.e., the top national and international conferences in specific computational science domains. It is at such conferences that technical staff from the PRACE project can establish and strengthen ties with Europe's potential "tier-0" users by giving talks or presenting posters at poster sessions.

Ultimately, the present conference has shown that there *are* computational scientists in Europe ready or nearly ready to exploit a European tier-0 infrastructure, and who as of today rely on computational resources outside of Europe to remain at the forefront of their research fields. Future activities should be geared towards the identification, development and promotion of such researchers.

1 Introduction

Scientific computing is now well established as a third branch of science alongside theory and experiment, and a key technology for industrial product development and production optimisation. The Partnership for Advanced Computing in Europe (PRACE) has as its mission the preparation of a persistent, pan-European high performance computing (HPC) service to meet the needs of academia, industry and society.

The preparatory phase, which runs until the end of 2009, will establish the basis of a pan-European organisational structure for HPC provision to be managed as a single European entity. In addition, the project is undertaking all the necessary technical preparations, including the evaluation of components, systems and facilities, the porting and scaling of key scientific applications, and the development of a comprehensive training infrastructure, so as to be in a position to deploy and exploit the first petaflop/s systems in 2009/2010. The service will comprise three to five "tier-0" supercomputing centres strengthened by regional and national HPC centres working in collaboration. In this way, European researchers will be provided with access to world-class supercomputing resources, well beyond those affordable at a national level. The project, which has received €10 million funding for 2008/9 from the EU's 7th Framework Programme on an overall budget of €20 million, is led by principal partners Germany, Spain, UK, France and the Netherlands, along with a further nine general partners.

In its roadmap published in 2006, the European Strategy Forum on Research Infrastructures (ESFRI) identified HPC as a strategic priority for Europe – an area where for the last decade Europe has taken a back seat to the United States and Japan. Since Europe has no significant HPC hardware industry, the process of nurturing European research is based on a coherent integration of infrastructures. For this reason, PRACE will work in close collaboration with other European research infrastructures, notably those in the comprehensive ESFRI road map. The goal is to create a powerful European HPC infrastructure and service to meet the needs of scientific and industrial communities across Europe.

Leadership-class computing is of the highest and most pervasive strategic importance. Supercomputers enable scientists and engineers to solve today's problems and to develop the new technology for tomorrow's industry, affecting national employment patterns and national wealth. To further the aim of enabling the academic and industrial research in Europe to develop and use world class HPC, it is important to strengthen contacts with and between scientific communities, in particular those involved in helping to develop the very science case on which this effort is based. To this end, PRACE is responsible for organising two scientific conferences during the course of the project. The first of these, which was held on November 26 in Lyon and organized alongside ICT 2008, the largest research event for information and communication technologies in Europe, is the focus of the present report.

2 Motivation and venue

We considered the ICT event, which is held biennially and attracts some 4000 attendees, an ideal platform to facilitate discussion and collaboration between researchers, technical experts and policy makers, towards PRACE's goal of establishing an HPC infrastructure in Europe. By organising the workshop during ICT 2008, PRACE was able to connect closely with other European ICT projects, such as DEISA and EGEE, enhance collaboration and identify areas of overlap or duplication of effort. Moreover, by piggybacking on a major conference the time and effort expended in organisational matters (selection of venue, accommodation, catering and so on) were greatly reduced.

Early in 2008, the ICT event organisers sent out a call for networking sessions, designed to "facilitate contacts between researchers, innovators and engineers from all ICT fields." PRACE submitted a proposal entitled "Scientific Computing in the Petascale Regime: a European HPC Infrastructure," which was approved in September, two months before the event. At that time it was decided that PRACE would hold an additional session of presentations in the evening on the same day as the networking session. The Hotel de la Cité Concorde was chosen as the venue for the evening session because of its convenient location directly adjacent to the Centre de Congrès de Lyon. These two sessions, along with a summing-up dinner, together formed the first scientific conference, or "workshop" as it will often be referred to in this document.

The themes of the workshop were "applications, architectures and training needs for the petascale regime." The sessions aimed at forging and enhancing the collaboration between European researchers and technical experts: the programme included talks from PRACE members describing the planned infrastructure (including the likely architectures, application and training support) and talks from application scientists describing their research aimed towards petascale computing. The final programme is detailed in section 5.

3 Advertising

The workshop was advertised by means of press releases, magazine articles and on the PRACE website. Invitations were sent to the top ten HPC users at each PRACE partner site, the moderators of the five scientific areas of the HET case for HPC, and PRACE newsletter subscribers.

3.1 Press releases

A press release announcing the workshop was published on 15 October 2008 on the PRACE website and the AlphaGalileo service, which reaches some 6800 journalists around the world. The press release made press cuttings in HPCWire and International Science Grid This Week. The press release is available from the PRACE website [3].

An article was written for The Parliament Magazine's November issue of Research News (see Figure 1), a magazine with 12,000 readers in the European Parliament, European Commission and throughout the EU. In addition to the normal readership this issue was sent directly to 5,000 EU heads of Research and was presented to all delegates attending the ICT 2008 event.

Figure 1: An article published in The Parliament Magazine's November issue of Research Review

Announcements about the workshop were posted on PRACE partners' websites, and a press release was distributed via the ICT 2008 press office.

3.2 Website

A page dedicated to the workshop was added to the PRACE website. After the event the page was moved to the "past events" section, and can now be viewed at [2].

The website contains general information about the workshop and also downloadable materials including a flyer advertising the workshop (see section 3.3) and the final programme (see Annex II). Registration for the event was handled via an online form on the PRACE website. The speakers' presentations and photos from the conference were added to the website at the conclusion of the event.

3.3 Flyer

An information flyer was produced to attract potential attendees to the event (see Figure 2). The flyer was available online and at the ICT 2008 exhibition booth, and was also distributed during the networking session and evening session.

3.4 Final Programme and speaker biographies

The final programme with abstracts and speaker biographies (see Annex II) were available at the event's website and presented to the workshop attendees.

4 Attendees

There were 38 registered attendees for the evening session, and over 40 participants attended the networking session in the morning. An attendance sheet was circulated at the networking session, and those who chose to sign it, or were registered for the evening session, are listed in Annex I.

There were attendees from a total of 16 countries: Austria, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Greece, Italy, India, the Netherlands, Poland, Portugal, Romania, Spain and Switzerland. There was representation from a wide range of areas including the computational sciences, the PRACE project, other European projects in the ICT domain, as well as members of the HPC vendor community. In addition, two members from the European Commission were present at the networking session.

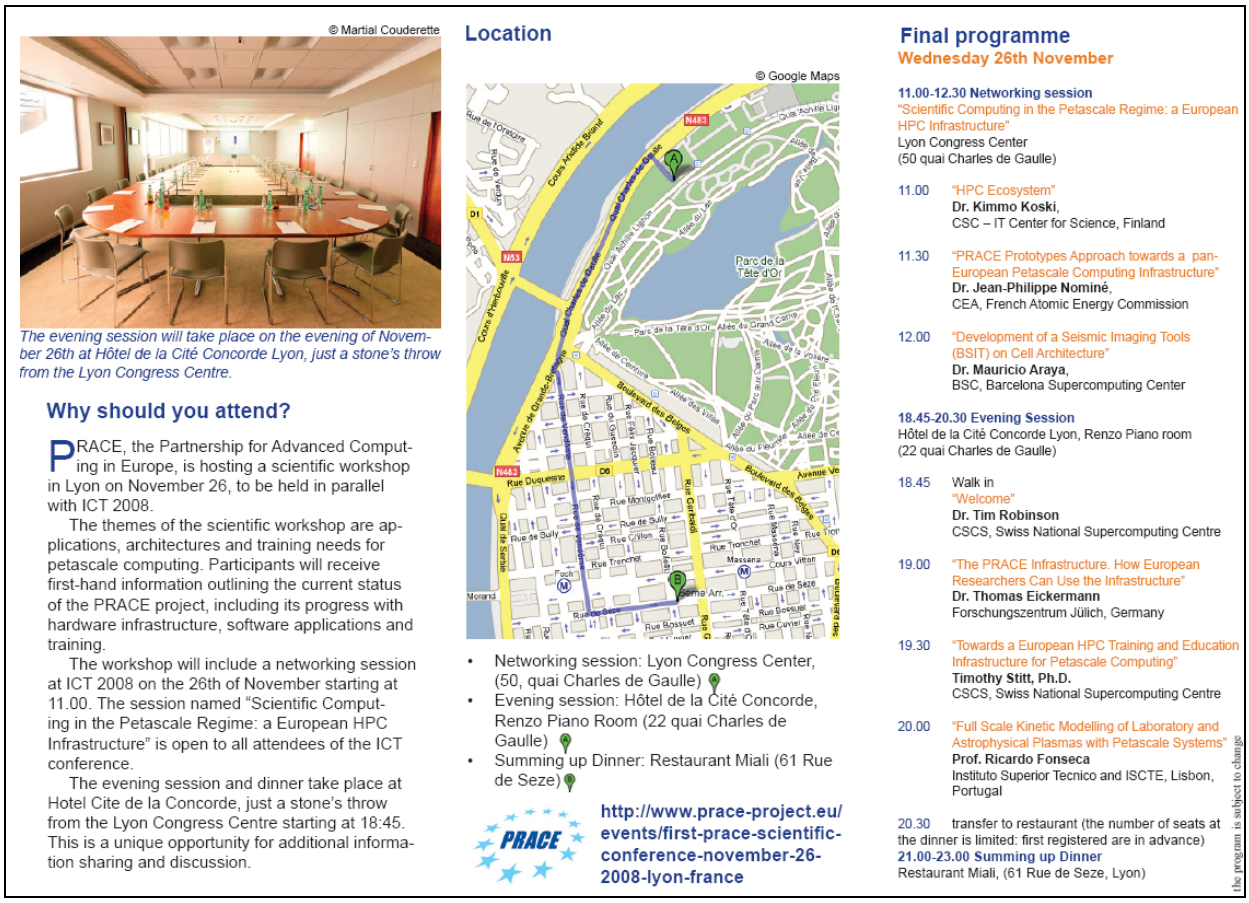

Figure 2: The conference flyer

5 Event

The themes of the workshop were applications, architectures and training needs for the petascale regime, with a programme consisting of a mix of talks by PRACE staff and application scientists. The presentations are summarized in the following sections, and the slides are available on the PRACE website [4].

5.1 Networking session at ICT 2008

The networking session consisted of four 20-minute presentations followed by a general question and answer session. The agenda was designed to cover aspects of the project from multiple viewpoints: the first presentation provided a high-level abstraction focussed on project management, governance and the development of an HPC infrastructure in Europe; the second was targeted at a more practical level, describing the use of prototype architectures to ensure that scientists (in terms of scalable software applications) and HPC centres (in terms of facilities management, integration and support) will be ready to exploit the PRACE infrastructure in 2009; the third presented the computational scientist's perspective; and the fourth addressed the practical aspects of access provision.

5.1.1 *Agenda*

11:00 "The HPC Ecosystem," Dr. Kimmo Koski (CSC)

11:20 "PRACE Prototypes Approach Towards a Pan-European Petascale Computing Infrastructure," Dr. Jean-Philippe Nomine (CEA)

11:40 "Development of a Seismic Imaging Tools (BSIT) on Cell Architecture," Dr. Mauricio Araya (BSC)

12:00 "HPC-Europe and HPC-Europa2 Transnational Access Selection: A Possible Model for Tier-0 Access," Dr. Sergio Bernardi and Dr. Francesca Garofalo (CINECA)

12:20 Questions and Discussion Forum

5.1.2 *Presentations and discussion*

The networking session, "Scientific Computing in the Petascale Regime: a European HPC Infrastructure," was chaired by Tim Robinson (CSCS), who welcomed the audience and opened the session by presenting a brief introduction to the PRACE project.

The first presenter was Kimmo Koski (CSC), who outlined the role of PRACE in building an HPC ecosystem in Europe. Koski described the conception of the PRACE initiative from its roots in ESFRI's High Performance Computing in Europe service (HPCEUR, 2004), the HPC in Europe Task Force (HET, 2006), and the ESFRI Roadmap (2006), after which he introduced the project partners and described the roles and responsibilities of the eight work packages. He then summarized the project's primary high-level objectives: the definition of a legal form and governance model for the research infrastructure, the specification of funding and usage strategies, the establishment of a peer-review process, the development of an operational model, and the selection of prototype and production systems. After focussing on the PRACE project, Koski described a vision for the European HPC ecosystem based on an analysis of the stakeholder categories identified by PRACE: HPC service providers, European HPC and Grid projects, networking infrastructure providers, hardware and software vendors, end users (and their access through related Research Infrastructures), national and international funding bodies, and policy makers. He stressed the importance of developing a European HPC Ecosystem in Europe, i.e. one focussed not only towards Europe's current strengths in HPC, for instance in software development, research, and training, but also focussed towards areas such as manufacturing and integration, areas where Europe might currently be considered to have a more passive role in being (predominantly) a consumer of HPC technology.

The second presenter, Jean-Philippe Nominé (CEA) described in depth the six prototype systems selected by WP7 as promising architectures for petaflop/s systems in 2009. Nominé gave the reasons for choosing this set of prototypes, arguing that they cover most of the components expected to be the building blocks of 2009/2010 production systems. He then discussed the intended use of the prototypes in the evaluation, benchmarking and optimisation of user applications, the evaluation of software libraries and programming models, the deployment of software for distributed systems management, and in providing technical specifications for production systems. He discussed each prototype system in turn, giving the date of availability and showing what proportion of the system would be available for PRACE activities. The talk was concluded with a slide hinting at the second set of prototypes, from WP8, which will focus on more novel compute units and/or accelerators, hybridisation and advanced programming environments. The set of prototypes selected by WP8 is being reviewed by the EC at the time of writing.

One of BSC's contributions to the PRACE applications suite (WP6) is the Barcelona Seismic Imaging Tools (BSIT). The next speaker, Mauricio Araya, a geophysics researcher at BSC presented his research on the development of seismic imaging tools, and specifically the porting of the main algorithm, for Reverse Time Migration, from the PowerPC to Cell/BE platform. Araya discussed some of the difficulties inherent in programming the Synergistic Programming Elements (SPEs) in the Cell processor and how their parallelisation strategy can

overcome these. Recent results showed that their algorithm achieves nearly 95% of peak memory bandwidth, and roughly 12X speedup compared to a PowerPC 970MP multi-core processor and an order of magnitude increase in energy efficiency. As discussed by Nominé in his earlier talk, a WP7 prototype system consisting of a cluster of Cell blades is in the process of being installed at BSC, and will be available in December 2008.

In the final scheduled presentation, Sergio Bernardi and Francesca Garofalo (CINECA) discussed the HPC-Europa2 project, which deals with transnational access to seven supercomputing centres in Europe. They described the access model used by HPC-Europa2 and proposed it as a potential model for the PRACE "tier-0" infrastructure. Bernardi asked questions such as whether or not peer review-based selection was sufficient for tier-0 access, and whether tier-0 support activity is qualitatively different to tier-1, tier-2, and so on. It should be noted that the relationship between funding and usage strategies for the PRACE infrastructure is currently being discussed in WP2 Task 3. Options being investigated range from one where the allocation of time is based purely on peer review and quality of science to one where there is a direct relationship between funding and utilisation: i.e. the amount a partner contributes (either as cycles or as funding) determines the number of cycles allocated to its researchers.

The formal presentations were followed by a 15-minute question and answer session. Most of the discussion was centred on the relationship of PRACE to other European projects, especially DEISA, and how non-members can contribute to the PRACE initiative.

5.2 Evening session at Hotel de la Cité Concorde

The evening session was effectively a second session of the workshop as a whole. It focussed on topics closer to the application scientist: specifics of how to access the infrastructure; a training and education programme for petascale computing; and a example of computational science in Europe that is approaching petaflop/s performance. Approximately half of those who had been present at the networking session during the morning also attended the evening session, along with a few additional participants.

5.2.1 *Agenda*

18:45 Welcome, Dr. Tim Robinson (CSCS)

19:00 "The PRACE Infrastructure. How European Researchers Can Use the Infrastructure", Dr. Thomas Eickermann (FZJ)

19:30 "Towards a European HPC Training and Education Infrastructure for Petascale Computing", Dr. Timothy Stitt (CSCS)

20:00 "Full Scale Kinetic Modelling of Laboratory and Astrophysical Plasmas with Petascale Systems", Prof. Ricardo Fonseca (Instituto Superior Técnico and ISCTE, Lisbon)

20:30 Transfer to restaurant for summing up dinner

5.2.2 *Presentations and discussion*

Thomas Eickermann (FZJ) first presented some of the highlights from the first year of the PRACE project, before discussing the issues surrounding funding and usage models. He showed the (provisional) access model, which is based on peer review but respects national interests. In this model there are three types of resource allocations: test and evaluation access, project-based access (ca. 1 year timescale), and programme-based access, all of which would be free at the point of use. Eickermann stated that the funding stream is likely to

originate predominantly from the individual partner countries, with some contribution from Europe. He then discussed access to the prototype and production systems: access to prototypes will be possible for testing purposes only, first through a lightweight application process and later through a peer-review process, while access to production systems will be through peer-review for academic-based project proposals. At a practical level, access will be allowed via ssh software or Grid mechanisms (UNICORE middleware), and some applications might be made available through portals.

Tim Stitt (CSCS) then addressed a topic fundamental to the effective use of a petascale-computing infrastructure: training and education. Stitt stressed that only through adequate training will users be able to overcome the vast complexities involved in developing and porting scientific codes to petaflop/s architectures consisting of potentially hundreds of thousands of processing cores; and without adequately trained users the impact of a pan-European HPC infrastructure will be significantly diminished. He described the development and implementation of an education and training programme for computational science aimed at scalable computing, designed based on the conclusions of PRACE deliverable D3.3.1. This infrastructure consists of hands-on training (summer and winter schools, the first of which took place in Stockholm in August), a centralised database of high quality and up-to-date training material, and a vision to exploit modern modes of training such as virtual learning environments, remote training and video technologies to create an "on-demand" HPC training ecosystem. A PRACE Training Portal is planned that will be a single point of entry hosting training material, podcasts and online seminars, training news and events, vendor articles and publications, and community directed discussion forums.

Ricardo Fonseca (Instituto Superior Técnico and ISCTE) then presented his research on kinetic plasma simulations. His code, a fully relativistic electromagnetic particle in cell code with dynamic load balancing, has scaled to 4,096 processors on the Cray XT4 at NERSC and to over 32,000 processors on the BlueGene/P at Argonne. Fonseca is a case in point of the need for leadership-class supercomputing in Europe – to date he has had to rely on the resources available at national laboratories in the United States to remain at the forefront of plasma science. Currently he is focussing his development on hardware acceleration – SIMD units, Cell and GPU – and advanced visualization and diagnostics. The Institute for Plasmas and Nuclear Fusion (IPFN) will host the 21st International Conference on Numerical Simulation of Plasmas in October 2009 in Lisbon, Portugal. This would be an ideal opportunity for PRACE to interact more closely with the European research community.

5.3 Summing up dinner

A summing up dinner was held at Restaurant Miali, 61 Rue de Seze.

6 Feedback

The following questions were raised at the scientific workshop (several of these were also frequent topics of conversation at the PRACE exhibition booths at ICT 2008 and SC08):

- When the PRACE infrastructure will become operational?
- Who can use the infrastructure?
- How can I get access to the prototypes and the petaflop/s machines?
- I'm not from Europe. Can I have access to the infrastructure or collaborate with PRACE in other activities?
- How can other European countries [Czech Republic, Bulgaria] join, contribute to, or benefit from PRACE?
- What is the difference between the PRACE Initiative and PRACE project?
- Is PRACE comparable to TeraGrid?
- What is the relationship between PRACE and DEISA?
- What is the relationship between PRACE and EGEE or EGI?

Some of these questions are currently being debated within the PRACE project, and others have been discussed in an Annex to D2.5.2. It is proposed that a FAQ be added to the PRACE website that is regularly updated as policies are established.

7 Conclusions and future plans

It was decided early in the planning phase that organising a full-blown scientific conference was not feasible, or indeed sensible, for a number of reasons. Firstly, the PRACE infrastructure is not yet in place so it would be difficult for presenters to show how their science has been advanced by PRACE. Secondly, scientists typically attend only a small number of conferences each year, often ones highly specific to their own research domain. Such conferences are generally very well established, and attract the majority of experts within their specific research fields. It is unrealistic to expect top computational scientists to present work at a conference organised by PRACE with limited academic credibility and international standing. Thus, in order to increase the awareness of PRACE in the scientific community and foster relationships with key academic groups we suggest,

- *that PRACE should send delegates to the scientists' own conferences*; and
- *that giving talks and presenting posters at such events* would be an effective way of interacting with the scientific community.

A further option that could be explored is the *sponsoring* of specific conferences in the computational sciences. This would provide maximum visibility and opportunity to strengthen contacts with academia.

The present workshop was successful, however, in showcasing the PRACE project in the context of other European projects within the ICT research domain. A second workshop is planned in Amsterdam in May 2009, as described in section 7.2 below.

Additionally, the workshop showed that there *are* computational scientists in Europe who are ready and able to exploit "tier-0" facilities. As we have seen, Prof. Ricardo Fonseca (Instituto Superior Técnico and ISCTE), for example, has to date relied on resources available at Argonne and NERSC to remain at the forefront of plasma simulation research.

7.1 Dissemination

The next PRACE newsletter (Issue 5, January 2009) will carry an article about the workshop. Several attendees have requested copies of the slides, and they are available at the PRACE website [4].

7.2 Second scientific conference

The second scientific conference is being organised in conjugation with the DEISA Symposium, to be held in Amsterdam on the 11th-13th May 2009. An agenda comprising eight sessions over the three days was proposed at a meeting in Austin during SC08. The agenda includes sessions dedicated to scientific communities (Fusion, Astrophysical Sciences, Climate Research and the Life Sciences), and sessions outlining PRACE and DEISA achievements. Further information regarding the Symposium and Scientific Workshop will be posted on the PRACE website.

7.2.1 *Proposed agenda*

Monday	12:00-13:00	Lunch
	13:00-13:15	Welcome

	13:15-17:30	Session 1, Coffee, Session 2
	Evening	Dinner (speakers, DEISA Exec, PRACE MB)
Tuesday	9:00-12:30	Session 3, Coffee, Session 4
	12:30-14:00	Lunch
	14:00-17:30	Session 5, Coffee, Session 6
	Evening	Conference Dinner
Wednesday	9:00-12:30	Session 7, Coffee, Session 8
	12:30	Closing Remarks

8 Annex I: List of Attendees (registered and casual)

Last Name	First Name	Country	Affiliation
1. Aerts	Patrick	NL	NCF
2. Antoniadis	Joannis	GR	International Hellenic University
3. Araya	Mauricio	ES	BSC
4. Assor	Jean-Luc	FR	HP
5. Autere	Heli	FI	DEISA
6. Bacquet	Joel	BE	European Commission
7. Baratault	Jean-Christophe	FR	NVIDIA
8. Bernardi	Sergio	IT	CINECA
9. Bogaerts	Serge	BE	CENAERO
10. Chevaux	Patrick	CH	ClusterVision
11. Dama	Petcu	RO	West University of Tomisobra
12. de Jacquelot	Ghislain	FR	Voltaire
13. Demichel	Patrick	FR	HP
14. Dollfus	Marc	FR	Intel
15. Duda	Martin	CZ	Regional Development Agency
16. Duhem	Laurent	FR	Intel
17. Dorel	Jean-Luc	BE	European Commission
18. Dutka	Lukasz	PL	CYFRONET
19. Eickermann	Thomas	DE	FZJ
20. Gentzsch	Wolfgang	DE	DEISA-2
21. Fonseca	Ricardo	PT	IST and ISCTE
22. Garofalo	Francesca	IT	CINECA
23. Gupta	Sapana	IN	Pt R S University
24. Halver	Manfred	AT	Austrian Research Promotion Agency
25. Himmler	Valentin	DE	HLRS
26. Jakobsson	Anni	FI	CSC
27. Koski	Kimmo	FI	CSC
28. Laaksonen	Leif	FI	CSC
29. Llurba	Rossend	NL	NCF
30. Masella	Michel	FR	CEA
31. Morel	Jean-Marc	FR	BULL

Last Name	First Name	Country	Affiliation
32. Mitjana	Enric	BE	European Commission
33. Nair	Torosi	IN	D.S. Institution
34. Nominé	Jean-Philippe	FR	CEA
Porras	Jari	FI	Lappeenranta University of Technology
35. Reinhard	Marc	DE	MPI-meteorology
36. Robinson	Tim	CH	CSCS
37. Sanyal	Biplab	SE	UPPMAX
38. Spasova	Sonia	BE	European Commission
39. Stitt	Timothy	CH	CSCS
40. Schöttner	Michael	DE	University of Düsseldorf
41. Stoyanova	Nelly	BG	State ICT Agency
42. Tirler	Roman	IT	CRS4
43. Turunen	Ari	FI	CSC
44. Vandenbroucke	Rosette	BE	University of Brussels

9 Annex II: Programme, abstracts and speaker biographies

Applications, Architectures and Training Needs for the Petascale Regime

PRACE Workshop at ICT 2008, Lyon, France
Final programme

Wednesday, 26th November, 2008

Networking session: "Scientific Computing in the Petascale Regime: a European HPC Infrastructure"
Lyon Congress Center (50 quai Charles de Gaulle)
at 11.00–12.30

This networking session is part of the ICT 2008 conference and is open to all attendees of the ICT conference.

11:00	"HPC Ecosystem"	**Dr. Kimmo Koski** (CSC – IT Center for Science, Finland)
11:20	"PRACE Prototypes Approach towards a pan-European Petascale Computing Infrastructure"	**Dr. Jean-Philippe Nominé** (CEA, French Atomic Energy Commission)
11:40	"Development of a Seismic Imaging Tools (BSIT) on Cell Architecture"	**Dr. Mauricio Araya** (BSC, Barcelona Supercomputing Center)
12:00	"HPC-Europa and HPC-Europa2 transnational access selection: a possible model for Tier-0 access"	**Dr. Sergio Bernardi and Dr. Francesca Garofalo** (CINECA, Italy)
12:20	questions and discussion	

Evening session:
Hôtel de la Cité Concorde Lyon (22 quai Charles de Gaulle), Renzo Piano room
at 18.45–23.00

18:45	Walk in	
	Welcome	**Dr. Tim Robinson** (CSCS, Swiss National Supercomputing Centre)
19:00	"The PRACE Infrastructure. How European Researchers Can Use the Infrastructure?"	**Dr. Thomas Eickermann** (Forschungszentrum Jülich, Germany)
19:30	"Towards a European HPC Training and Education Infrastructure for Petascale Computing"	**Ph. D. Timothy Stitt** (CSCS, Swiss National Supercomputing Centre)
20:00	"Full Scale Kinetic Modelling of Laboratory and Astrophysical Plasmas with Petascale Systems"	**Prof. Ricardo Fonseca** (Instituto Superior Tecnico and ISCTE, Lisbon, Portugal)
20:30	transfer to restaurant (by taxis)	
21:00	Summing up dinner at Restaurant Miali (61 Rue de Seze)	Discussion

www.prace-project.eu

Contact:
Anni Jakobsson: anni.jakobsson@csc.fi
Tim Robinson: robinson@cscs.ch
www.prace-project.eu/events

Applications, Architectures and Training Needs for the Petascale Regime

PRACE Workshop at ICT 2008, Lyon, France
Final programme

Wednesday, 26th November, 2008

Networking session: "Scientific Computing in the Petascale Regime: a European HPC Infrastructure"
Lyon Congress Center (50 quai Charles de Gaulle) at **11.00–12.30**

Speaker bio: Kimmo Koski, CSC – IT Center for Science
Kimmo Koski is the Managing Director of CSC – IT Center for Science, Finland. During the recent years he has been involved in European collaboration in High Performance Computing and grid activities, among them chairing the European strategy group for high-end computing (HPC in Europe Taskforce, HET). As one result of this group Petaflop computing was raised to European agenda, resulting for example the Partnership for Advanced Computing in Europe (PRACE) collaboration.

Presentation at the PRACE workshop: "HPC Ecosystem"
During 2006-2008 there has been intense work in Europe in order to increase European competitiveness in HPC. Various new activities have been started in addition to the existing European grid projects EGEE-III and DEISA-2. The most visible of those new activities is Partnership for Advanced Computing in Europe (PRACE) for petaflop level computing.

European Strategy Forum for Research Infrastructures (ESFRI) published its first roadmap in 2008, which includes a set of new major European infrastructures. The ESFRI roadmap is being updated in 2008 with a selection of new proposed infrastructures. Since most of the ESFRI list projects require high end computing, data management and software development, the establishment of such new research environments is expected to explode the need in Europe for the 'horizontal layer' of ICT services spanning over multiple disciplines. The talk will review the current European collaboration and future plans in HPC. The role of PRACE in HPC Ecosystem and its impact will also be discussed.

Speaker bio: Jean-Philippe Nominé, CEA, France
Dr. Jean-Philippe Nominé lead Data Management and Post-Processing Group then was Deputy Head of a high performance simulation codes unit at CEA/DIF Supercomputing Centre in Bruyères-le-Châtel. He is now involved in PRACE Project, for which he coordinates various CEA activities and mostly contributes to Work Package 7 "Petaflop/s systems for 2009/2010". Dr. Nominé received his Ph.D. from Pierre-et-Marie-Curie University in Paris before joining CEA HPC division in 1992.

Presentation at the PRACE workshop: "PRACE prototypes approach towards a pan-european Petascale computing infrastructure"
PRACE has selected a broad coverage of promising architectures for Petaflop/s-class systems to be deployed in 2009/2010. Prototypes will be installed at six partner sites starting in 2008.

www.prace-project.eu

Contact:
Anni Jakobsson: anni.jakobsson@csc.fi
Tim Robinson: robinson@cscs.ch
www.prace-project.eu/events

We will explain the context of this action, which is PRACE technical approach to preparing the future pan-european Petascale computing infrastructure acquisition and deployment. We will briefly describe the first set of six prototypes selected during Summer 2008 and will mention the feedback we expect from HPC and applications experts that are going to use them. Then we will give hints on a second set of prototypes being currently selected by PRACE, oriented towards emerging technologies likely to contribute to multi-petaflop/s systems beyond 2010.

Speaker bio: Mauricio Araya, BSC Barcelona Supercomputing Center
Mauricio Araya-Polo Ph.D. is currently a computational geophysics researcher with the Barcelona Supercomputing Centre (BSC). Mauricio received his doctorate and master degree in Computer Science from University of Nice - Sophia-Antipolis (INRIA Sophia-Antipolis), Sophia-Antipolis. Prior to pursuit post-degree studies, Mauricio received his engineer degree in computer science from University of Chile, Santiago.

Presentation at the PRACE workshop: "Development of a Seismic Imaging Tools (BSIT) on Cell Architecture"
One of the Barcelona Seismic Imaging Tools (BSIT) is Reverse Time Migration (RTM). RTM has become the latest chapter in seismic imaging for geologically complex subsurface areas. In particular has proven to be very useful for subsaly oil locations. However, RTM cannot be applied extensively due to the extreme computational demand. In this presentation we will introduce our efforts to make RTM an affordable tool for daily use. In particular, we will cover our porting of the main algorithm from PowerPC platform to Cell/B.E. based platform.

Speaker Bio: Sergio Bernardi, CINECA, Italy
Sergio Bernardi holds a university degree in Computer Science. He has been working as business manager for many years in the area of IT infrastructure management and data center operations and was Head of Department. Since 2007 his activity concerns the organizational change management of the newly formed DSET department (Department for system and technology) and is responsible for the area of Business Development. He has been involved in PRACE activities since the beginning of the initiative and project.

Speaker Bio: Francesca Garofalo, CINECA, Italy
Francesca Garofalo is a lawyer and, after some years of legal activity, since 2000 is part of the CINECA Systems and Technologies Department. Her role is the administrative and financial management of research projects both funded by the EU and by the Italian Government. Since 2006 she works also on the business strategy, the management and monitoring of the Department. She is the project manager of HPC-Europa2.

Presentation at the PRACE workshop: "HPC-Europa and HPC-Europa2 transnational access selection: a possible model for Tier-0 access"
The HPC-Europa2 main objective is to maintain the persistency of high quality transnational access to the most advanced HPC infrastructures available in Europe for the European computational science community.
Due to a long successfully tradition, started from the IV° FP, the HPC-Europa Transnational Access Board implemented an effective and reliable selection procedure that enables the consortium to select the most promising and challenging projects. The system developed allows the Selection Panel and some hundreds of collaborating Scientific Hosts to individuate and support the European researchers working at the forefront of science and may represent a potential model for Tier-0 access.

www.prace-project.eu

Contact:
Anni Jakobsson: anni.jakobsson@csc.fi
Tim Robinson: robinson@cscs.ch
www.prace-project.eu/events

Applications, Architectures and Training Needs for the Petascale Regime

PRACE Workshop at ICT 2008, Lyon, France
Final programme

Wednesday, 26th November, 2008

Evening session:
Hôtel de la Cité Concorde Lyon (22 quai Charles de Gaulle), Renzo Piano room
at 18.45–23.00

Speaker Bio: Dr. Thomas Eickermann, Forschungszentrum Jülich, Germany

Thomas Eickermann received his Ph.D. in Plasma Physics at the University of Düsseldorf. He is working at the Research Centre Jülich since 1994, where he is head of the networking division of JSC, the Jülich Supercomputing Centre. He has been involved in several national and European projects mostly related to networking and Grid computing and is currently the project manager of PRACE.

Presentation at the PRACE workshop: "The PRACE Infrastructure. How European Researchers Can Use the Infrastructure?"

PRACE, the Partnership for Advanced Computing in Europe is working towards the creation of distributed permanent Research Infrastructure that will provide world-class HPC services to the European research and engineering communities. The presentation will give a short overview over the objectives of the project and the achievements so far. A particular focus will be the on the services that PRACE plans to provide.

Speaker bio: Timothy Stitt, CSCS, Swiss National Supercomputing Centre

Tim Stitt Ph.D. is currently a HPC Support Scientist with the Swiss National Supercomputing Centre (CSCS). Tim received his doctorate in computational physics from Queen's University, Belfast and subsequently spent 5 years lecturing in Computer Science at the University of the West Indies. Prior to joining CSCS, Tim worked as a HPC Support Scientist with the Irish Centre for High-End Computing (ICHEC).

Presentation at the PRACE workshop: "Towards a European HPC Training and Education Infrastructure for Petascale Computing"

PRACE (Partnership for Advanced Computing in Europe) has been established to create a permanent pan-European High Performance Computing service for research. To effectively exploit these leadership-class resources, users will be required to master both existing and novel programming techniques and technologies, to take full advantage of these potentially complex computing systems. In this presentation I review the results of

www.prace-project.eu

Contact:
Anni Jakobsson: anni.jakobsson@csc.fi
Tim Robinson: robinson@cscs.ch
www.prace-project.eu/events

a recent European-wide training and education survey of top-tier HPC users and introduce the measures being undertaken by PRACE to resolve the shortcomings identified in the survey, including the proposal for a centralized pan-European HPC training and education repository.

Speaker Bio: Ricardo A. Fonseca, IST and ISCTE, Lisbon, Portugal

Ricardo A. Fonseca is currently the chief developer of the OSIRIS framework, a massively parallel code for modeling high energy density scenarios. Ricardo received his doctorate degree in physics from the Technical University of Lisbon in 2002, having also worked at the Plasma Simulation Group at the University of California, Los Angeles. In 2003, he became an Assistant Professor with the Instituto Superior de Ciências do Trabalho e da Empresa (ISCTE), Lisbon and is also a Researcher with the Instituto de Plasmas e Fusão Nuclear, Instituto Superior Técnico (IST), Lisbon.

Presentation at the PRACE workshop: "Full Scale Kinetic Modelling of Laboratory and Astrophysical Plasmas with Petascale Systems"

Petaflop class systems open the door for full scale numerical experiments modeling kinetic plasmas ranging from astrophysical shocks, to high intensity laser-plasma interactions, with applications to fast ignition of nuclear fusion targets and particle accelerators. These problems are computationally intensive, with one-to-one simulations requiring 10^6 - 10^7 iterations and up to ~ 10^6 cpu hours to complete. I will present the issues associated with ab initio numerical simulations of such scenarios, focusing on the aspects involving the use of Petascale systems and hardware acceleration, code efficiency and optimization, and new algorithms. Performance benchmarks and scalability (up to 32k cpu cores) will be discussed in connection with the challenges for petascale computing. We will also discuss new visualization and data mining tools developed for these numerical experiments and recent simulation work illustrating these techniques.

www.prace-project.eu

Contact:
Anni Jakobsson: anni.jakobsson@csc.fi
Tim Robinson: robinson@cscs.ch
www.prace-project.eu/events