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Establishment of PRACE Advanced Training Centres

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List of Acronyms and Abbreviations

AISBL	"Association Internationale à But Non Lucratif", international non-profit association under Belgian law
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)
CSC	Finnish IT Centre for Science (Finland)
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)
GPU	Graphic Processing Unit
HLRS	High Performance Computing Center Stuttgart (Germany)
HPC	High Performance Computing; Computing at a high performance level at any given time; often used synonym with Supercomputing
ICHEC	Irish Center for High-End Computing (Ireland)

IDRIS	Institut du Développement et des Ressources en Informatique Scientifique (represented in PRACE by GENCI, France)
INDICO	Integrated Digital Conference; an on-line platform for organising events
LRZ	Leibniz Supercomputing Centre (Garching, Germany)
OMB	(PATC) Operational Management Board
MIC	Many Integrated Core
MPI	Message Passing Interface
MdlS	Maison de la Simulation (represented in PRACE by GENCI, France)
Open MP	Open Multi-Processing
PGAS	Partitioned Global Address Space
PATC	PRACE Advanced Training Centre
PRACE	Partnership for Advanced Computing in Europe; Project Acronym
PRACE-1IP	First implementation phase of PRACE
PRACE-2IP	Second implementation phase of PRACE
PRACE-3IP	Third implementation phase of PRACE
R&D	Research and development
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
UPC	Universitat Politècnica de Catalynua (Barcelona, Spain)
WP	Work package; project internal work group
2IP-WP4	Training work package of the Second implementation phase of PRACE

Executive Summary

This document describes the first steps carried out to establish hubs for high-performance computing training and education: PRACE Advanced Training Centres (PATC). The first six PATCs became operational early 2012, with the mission to serve as European hubs of advanced, world-class training and education for researchers and students in computational sciences, providing and coordinating knowledge transfer activities needed to achieve best utilisation of the PRACE research infrastructure by the community.

In this deliverable, we document the process employed in the selection of the first six hosting sites, present those sites and discuss various practical matters, such as efforts coordination, finances and curriculum building, related to the operation of the PATC network. Finally, some future plans for the PATC concept and operation are discussed. These plans include a PATC focused on industrial R&D as well as roadmap for PATCs after the end of the PRACE project series. The role and responsibilities of the AISBL regarding the PATCs need still to be defined in the future.

1 Introduction

Education and training activities have a crucial role in ensuring that the end-users of the PRACE (Partnership for Advanced Computing in Europe) [1] infrastructure are able to fully exploit the strengths of existing and future high-performance computing (HPC) hardware and software resources. The PRACE project series has been conducting a highly successful training programme [2][3], which had featured a series of face-to-face training events by various PRACE partners as well as an online Training Portal [4][5]. Furthermore, it was considered necessary to set up more permanent sites of HPC training – the PRACE Advanced Training Centres [6][7] (abbreviated as PATCs) – that will be for time being responsible for the quality and efficiency of PRACE training activities.

The mission of the PATCs is to serve as European hubs of advanced, high-quality training for researchers working in the computational sciences. The PATCs provide and coordinate training and education activities needed to achieve best utilisation of the PRACE research infrastructure by the community. The PATCs promote a common PRACE brand, representing the whole PRACE community rather than the hosting sites and implement a common training curriculum, designed and coordinated by PRACE with input from user communities. There will always be at least one such centre in operation, but the geographical locations of the hosting countries may and will vary over time. The long-term goal of the centres is to become the driver in European HPC education.

Once established, the PATC network will strive for the following goals [6]:

- Integrate expertise and know-how from partners to develop world-class training events
- Disseminate consolidated expertise back to partner institutions
- Support and leverage training and education collaboration between PRACE partners
- Coordinate and facilitate training collaboration between PRACE and other European research infrastructures and EC-funded projects
- Engage with the academic community to teach HPC methodologies in local programmes

This document is the first report about the process for establishment of the PATC network. It documents the lessons learnt during the course of work and serves a point of comparison for

later progress reports. The reader should keep in mind that the work is in its early stages and the first PATC workshops are being held at the time of the writing of this document.

This document is structured as follows: Section 2 describes the selection process for the first set of PATCs, each of them being presented in Section 3. Section 4 addresses organisation and management of the PATC network. In Section 5, future perspectives of the PATC network will be briefly discussed.

2 Selection process of PATC host-sites for 2012-2014

The PATC host-sites for 2012-2014 were selected using a peer-review process within 2IP-WP4. After an open call for applications from PRACE partners, an evaluation panel consisting of non-affiliated 2IP-WP4 leaders (WP and task-) selected the best qualified host-sites using pre-defined evaluation criteria. These host-sites were then proposed to the Management Board, that decided to nominate six PATC hosts for 2012-2014: BSC (Spain), CINECA (Italy), CSC (Finland), EPCC (United Kingdom), GCS (Germany), and Maison de la Simulation (France).

2.1 Call for hosts

The call for applications from PRACE partners to become PATC hosts was open from October 6, 2011 until October 20, 2011 (16:00 CEST). The text of the call can be found in Appendix 1 and the selection criteria were derived from PRACE 1IP-D3.2.3 [6]. A total of seven applications were received and evaluated.

2.2 Requirements for hosting a PATC

As outlined in the Call for Hosts (Appendix 1), the requirements for hosting a PATC can be divided into three categories: location, capability, and facilities.

2.2.1 *Location*

The selection of host-sites should aim to achieve a wide geographical and user-base coverage to be most effectively beneficial to PRACE users and the European research community at large. To this end, i) the hosting site must be in a PRACE member country, ii) there should be only one PATC located in a country, and iii) the PATCs should collectively form a comprehensive network that caters to all parts of Europe as well as to all types of users.

2.2.2 *Capability*

PATCs are called to serve as European hubs of advanced, world-class training for researchers working in the computational sciences. In order to do so, they need to have the capability of consistently hosting top-class training events over a long period. Thus, host-sites are required to either i) have a proven track-record of running a large number of such events, or ii) an ambitious future plan with adequate resources to implement it. Additionally, every host-site should have a large enough pool of skilled trainers available (internally or externally) with expertise to cover all areas of essential HPC training.

2.2.3 *Facilities*

In order to maximise the learning impact as well as to promote a professional PATC brand, it is essential to have excellent training facilities that support the learning process throughout the training events. To accomplish this, i) access to suitable computer classrooms should be guaranteed, ii) hospitable social areas for breaks and group work should be available, and iii) state-of-the-art educational infrastructure, including broadcast capability, should be present.

2.3   Selection criteria

The applications were evaluated using the 'PATC Application Score Sheet' in Appendix 2. Since all applications came from established training centres, the evaluation of the capability requirements outlined above were simplified to consider only past activities of each centre. All in all, seven categories were assessed for each applicant:

- ability to carry out large number of events
- consistency and track record of training activities
- pool of local trainers
- range of expertise and experience of local trainers
- effort commitment to PATCs
- venue and infrastructure
- value-add services

An interview was held with each applicant to clarify any queries by the panel or the applicant. The quantitative scores were agreed to by the evaluation panel unanimously, while the qualitative scores, such as "range of expertise" and "experience of local trainers", were an average of the individual scores by evaluation panel members. The total scores of each application are shown in Table 1.

PATC Applicant	Score
GCS	36.50
EPCC	35.00
CSC	33.75
CINECA	33.25
BSC	33.00
MdlS	33.00
PDC	23.70

Table 1. The total scores of each PATC host-site application in descending order.

2.4   Lessons learnt

Even though the evaluation process successfully identified an excellent set of initial PATC host-sites, some issues and points of future improvement were identified during the process.

First, both PRACE-1IP deliverable D3.2.3 [6] and the Call for Hosts (Appendix 1), state the need to achieve a wide geographical coverage of the PATCs. Even though from a human

perspective this seems a reasonable criteria, in fact it is extremely difficult to define any objective method for achieving this aim. Either an objective way of judging this needs to be devised for future calls or this requirement needs to be reserved as an option of last resort to differentiate between two (or more) equally good candidate host-sites.

Second, the employed scoring scheme (Appendix 2) was geared towards established training centres with extensive track-records in HPC training, since all applications came from such centres in the first call. In order to accommodate PRACE partners without as strong a history in training but with an ambitious plan and the resources to match, the protocol and scoring scheme needs to be adjusted for future calls.

Third, PATC host-sites that re-apply for the status, should be evaluated according to their past performance as a PATC host. This evaluation should be based on user feed-back from PATC training events and on how well the commitments of the PATC have been fulfilled.

3 First set of six PATCs

Collectively the six selected PATCs represent an excellent network of host-sites that have a good pan-European coverage, along with the expertise and resources to provide world-class HPC training in state-of-the-art facilities. This section provides a short profile of each PATC that were selected.

3.1 Profile: BSC

BSC is a consortium including the Technical University of Catalonia (UPC). Many of its senior researchers teach in UPC and supervise on postgraduate level on HPC subjects. It has the expertise in designing curricula, creating teaching material and learning activities on the right cognitive level for professional training events, oriented for international students. BSC had been awarded the *Servo Ochoa* national distinction in Spain, recognising its excellence in research and leading position in its outreach activities. It coordinates the Spanish Supercomputing Network and organises technical seminars and specific user training to improve the technical staff of each node. It also organises international training courses and has demonstrated experience and capability in organising research, industry related and educational workshops, exhibitions and congresses with various sizes.

3.2 Profile: CINECA

CINECA is the largest Italian supercomputing centre and one of the most important worldwide with an HPC environment. Some of the most important Italian industries use CINECA's HPC facilities as well. The HPC group in CINECA has a long experience in cooperating with the researchers in parallelising, enabling and scaling up their applications in different computational disciplines. CINECA has also a wide experience in providing education and training in the different fields of parallel computing and computational sciences. It also is collaborating with some vendors in exploring and testing new technologies for HPC (NVIDIA GPU, Intel MIC). CINECA organises three intensive 5- to 10- days parallel computing schools per year, as well as a range of other HPC training events locally.

3.3 Profile: CSC

CSC is a non-profit company of 230 employees providing IT support and resources for academia, research institutes and companies: modelling, computing and information services. CSC provides Finland's widest selection of scientific software and databases and Finland's

most powerful supercomputing environment. CSC is a leading training and education provider in the field of scientific computing in Europe. It offers a versatile, top-quality training portfolio in IT for science and education with around 80 training events each year. It supports university education and provides training modules that can be included as a part of a corresponding academic course. It maintains in-house training facilities with the latest hardware and software for scientific computing. CSC also facilitates and hosts training events in collaboration with graduate schools and other partners, participating in pan-European initiatives and networks for training.

3.4   Profile: EPCC

EPCC has been at the forefront of HPC training for over 15 years. As well as running a thriving one-year postgraduate masters course – the MSc in HPC – it teaches a range of undergraduate courses at the University of Edinburgh, and EPCC staff are also active in pedagogical research. EPCC has coordinated the training activities in several EU projects, actively participate in many more, and organised the UK national HPC training programme for over six years. Its training material is delivered worldwide, for example at PRACE seasonal schools and as tutorials at Supercomputing. EPCC also sells training courses to industry. Locally, training is delivered either in in-house dedicated facilities or in the University's state-of-the-art training facilities.

3.5   Profile: GCS

The Gauss Centre of Supercomputing has a long history of delivering high-quality training courses at its different locations in Jülich, Munich and Stuttgart as well as in collaborating with sites throughout Germany. GCS trainers are also involved in international training and tutorial sessions on the international level such as the Supercomputing Conference. Additionally, the GCS sites attract high-quality trainers from within Germany as well as trainers with international reputation due to their large number of established cooperations and intensive vendor collaborations. The GCS sites have high-quality facilities equipped with modern hardware and software to perform training sessions, record them and offer them later as blended learning courses. In 2010 the GCS sites have delivered 42 courses for industry and academia at 6 locations within Germany to more than 1000 participants, and 5 international courses or tutorials (i.e. participation in HPC training outside Germany).

3.6   Profile: Maison de la Simulation

The Maison de la Simulation (MdlS) is a joint laboratory created by three French national research institutions, CEA, CNRS and INRIA and two universities, Paris-Sud and Versailles-St Quentin. It is located on the Saclay campus near Paris, with companion sites to be created regionally. Its main goal is to promote the applications and efficient usage by the scientific communities of high performance computing and of the infrastructure deployed at the national (GENCI) and European (PRACE) levels. It works closely with GENCI (including the French national computing centres CCRT/TGCC, CINES, IDRIS) and INRIA, the French national research agency dedicated to computational sciences, to develop the French PATC network. Geographically well distributed in France, this strong partnership is aimed to offer an accurate and close training on systems and applications. It also allows close links with all the scientific communities deeply involved in HPC (climate science, astrophysics, material science, etc.). All the partners in this network have extensive experience in the field of training and have collaborated for a long time.

4 Operation and curriculum

4.1   Organisational structure

The PATC operations are supervised and steered by a PATC Operational Management Board (OMB) shown in Figure 1, consisting of one representative from each of the PATCs, one member from the current PRACE project (the training WP leader), and one member appointed by the PRACE AISBL. The OMB is responsible for setting guidelines for curriculum planning, for allocating a budget for each centre, and for defining a set of best practices and processes that will be adopted by the PATCs. Overseeing of common functions for the whole PATC network, such as publicity, registration, reporting, surveys, etc., is the responsibility of an OMB co-ordinator appointed by the OMB.

Each PATC is managed by a director and a co-ordinator. The PATC director is in charge of the centre's operations and is responsible for reporting of the results. (S)he acts as a representative of the training centre at the OMB and is involved in the work of the OMB. The PATC co-ordinator is responsible for the practical operations of the training centre, including arrangement of lecturers, ensuring top-quality facilities, catering, etc. (S)he is also responsible for monitoring the budget allocated to the centre. Both the PATC director and the PATC co-ordinator participate in curriculum planning for the centre according to the guidelines set by the OMB.
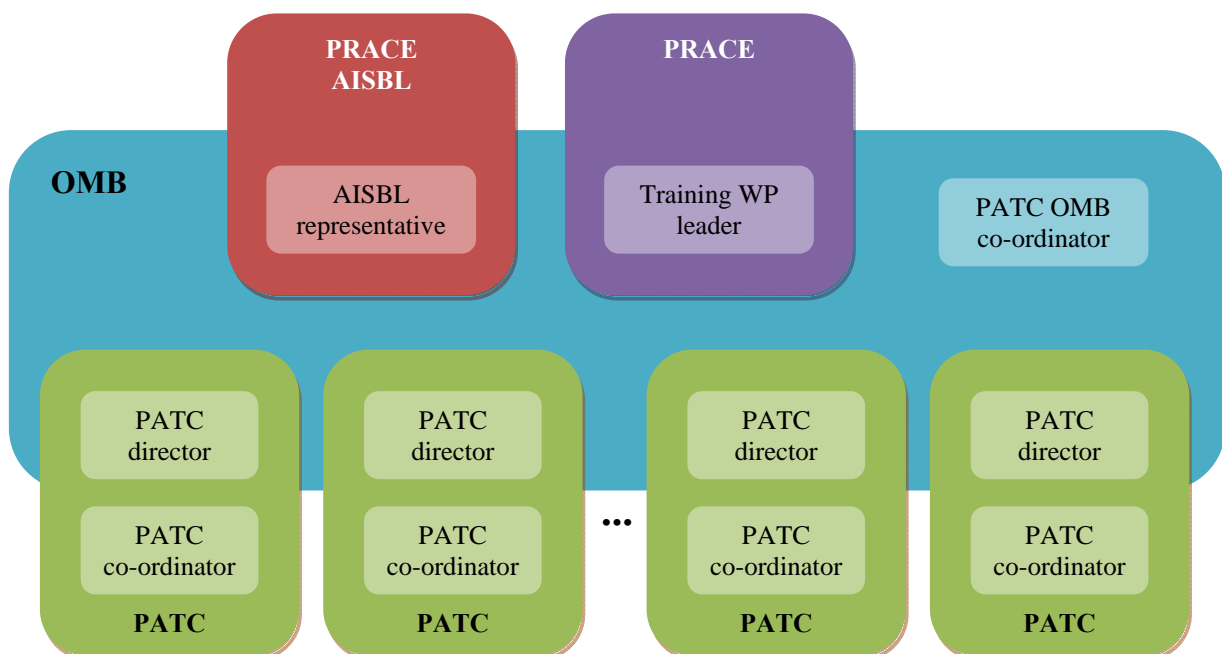
Figure 1: Members of the PATC Operational Management Board (OMB).

4.2   Curriculum planning

The planning of a joint PRACE Training Curriculum has been identified as an essential step in establishing a permanent, world-class HPC training service for European scientific communities. Close co-ordination with the AISBL is required for this work and it will be the major focus of effort in the OMB for the near future. It is envisioned that will we have a set of core training courses offered at each PATC every year that will cover the most important aspects of high-performance computing. These core courses will then be supplemented by a

wide range of more specialised courses and system workshops that will together provide the scientific community with the necessary skills and tools for fully utilising the top-tier computational resources offered by PRACE.

The curriculum planning will utilize the exhaustive information on the HPC training needs as described in the recent PRACE Training Survey [8] and incorporate knowledge gained from past experiences at the international level. According to this survey, the subjects of top, immediate priority include

- performance analysis and optimisation
- debugging tools and techniques
- advanced MPI;

subjects with a significant high priority include

- GPU computing
- hybrid OpenMP-MPI
- parallel program design
- architecture and compiler specific optimisation
- software engineering
- scientific visualisation
- OpenMP
- Python.

Subjects for which introductory courses should be provided to increase uptake include

- parallel I/O
- high-level numerical libraries
- PGAS and next-generation languages.

While the work is on-going to have a joint curriculum, the PATCs have agreed to host an initial set of events for the spring 2012 that is outlined in Table 2.

4.3   Dissemination plan

Effective dissemination of PATC activities is crucial for building visibility to the PATC network as well as for ensuring the sought after high-level impact to HPC training of European research communities. For this reason, formulation of a dissemination plan, to be agreed to by the AISBL, is of top priority for the OMB. Even after a dissemination plan has been made, the dissemination activities will be a continuous process that, for maximum effectiveness, will require oversight and guidance from the OMB. The dissemination plan itself may also need periodic updates to reflect current needs and thus should be reviewed from time to time.

It is clear that there are two main avenues for dissemination: centralised dissemination common to all PATCs and de-centralised local dissemination. Local dissemination can only have a positive impact and therefore the PATC co-ordinators should be encouraged to engage in this activity. Centralised dissemination needs to be harmonised and should adhere to a dissemination process set by the OMB. It has been identified that the list of PATC courses should be hosted and kept up-to-date at a single location to minimise unnecessary work and possible errors in the data. Since it has been decided to try to use the INDICO framework for course planning, the Training portal [4] as well as the PRACE-RI web-site [1] should pull the course details (list of events, dates, location) from the INDICO service. The publication of course offerings in PRACE newsletters is also considered an effective approach to be undertaken.

Direct e-mailing of potential trainees is also clearly an effective strategy. The contact database of PRACE offers the possibility to do this directly to PRACE users. A mailing list that would include all up-to-date PRACE contacts from the database would be an ideal tool to accomplish this goal. The course offering of all PATCs for the next two to three months could be collected into a single list of upcoming events that could be then distributed to the mailing list. Individual reminders of single events and additional advertisement through local contacts would then be the responsibility of the PATC co-ordinator organising the event.

It has also been proposed that the PATC network would publish a study guide at the beginning of a training season/year. This guide would include short descriptions of the different topics that will be trained in the PATCs and list the courses on these topics with an approximate time-frame when the course will take place. Such an study guide is foreseen to be an extremely useful aid for the prospective students planning their training needs as well as to give a clear overview of PATC activities.

Time	Location	Topic
19/03 - 22/03	GCS	Advanced Topics in HPC
02/04 - 05/04	GCS	Cray XE6 Optimization Workshop
09/04 - 11/04	CSC	Python in High-Performance Computing
24/04 - 26/04	EPCC	Message-Passing Programming with MPI
26/04 - 27/04	CSC	Next-Generation Sequencing Workshop
14/05 - 15/05	GCS	OpenACC Programming for Parallel Accelerated Supercomputers
21/05 - 22/05	EPCC	OpenMP for the QCD Community
21/05 - 22/05	GCS	Programming and Usage of the Supercomputing Resources in Jülich
21/05 - 22/05	BSC	Performance Analysis and Tools
23/05 - 24/05	BSC	Programming on GPUs with MPI+OmpSs
25/05	BSC	Programming PRACE and MontBlanc Prototypes: Tibidabo Machine
05/06 - 08/06	BSC	Introduction to CUDA Programming
11/06 - 15/06	CINECA	Summer School on Scientific Visualization
19/06 - 21/06	MdlS	OpenMP, OpenACC and HMPP
02/07 - 06/07	BSC	PUMPS Summer School
02/07 - 06/07	GCS	Introduction to the Usage of the SuperMUC Petaflop System at LRZ
02/07 - 04/07	GCS	GPU Programming using CUDA
05/07 - 06/07	GCS	Unified Parallel C and Co-Array Fortran

Table 2: PATC course listing for the spring 2012

5 Future development

In this Section, we will outline the future plans for developing the PATC network and concept.

5.1   Overview of the PATC roadmap

The roadmap for the PATC network and its relation to the PRACE project series at the time of writing of this document is illustrated in Figure 2. The PRACE projects will fully fund the six first PATCs until they reach two years of operation as well as one industry focused PATC (see section 5.2). The implementation project phase will also launch a set of new PATC for the operation duration 2014-2016, but these are funded by PRACE projects only until the end of the PRACE-3IP project, i.e. June 2014.
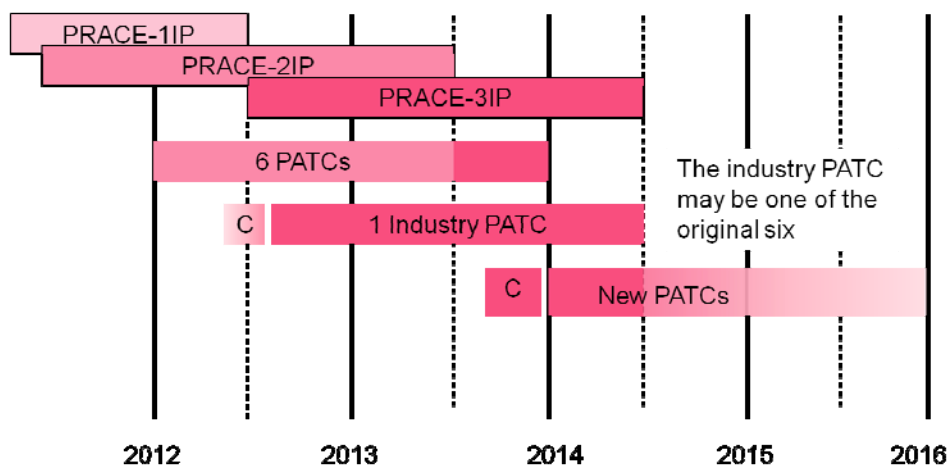

Figure 2: Two first cycles of PATCs and their relation to the series of PRACE projects.

5.2   Industry PATC

The PRACE-3IP project will establish a PATC with a special focus on industrial R&D and fostering collaboration between academic and industrial users. It is envisioned to serve as a pilot "competence centre" for various HPC-for-industry aspirations in the PRACE community. Its operation will be out of the phase of the current PATC two-year cycle. A specific call for its hosting site will be carried out by PRACE-2IP and the status can also be granted to one of the existing PATCs. A shared operation across a consortium of hosting sites may also be possible.

5.3   Collaboration with university education

The PATC concept features an aspiration to engage with academic communities to teach HPC methodologies in local MSc and PhD programmes, or even act as coordinators of MSc and PhD programmes in HPC. Any plans for this kind of activities have not been addressed so far by the PATC OMB and consequently have no concrete form yet. Nevertheless, this is considered an important aspect and will be discussed by the PATC OMB in the near future.

5.4   Plans for a permanent PATC service

The aim is that the PATCs would take the responsibility of PRACE training activities (seasonal schools, scientific workshops, Training Portal, education engagement, etc) after the

third implementation phase, acting as service providers for the PRACE AISBL. PRACE training events will of course be organised at locations outside of the countries hosting the PATCs; only the coordination work and responsibilities for these events would belong to the PATCs. Responsibility for the maintenance of the Training Portal platform will not necessarily belong to the PATCs.

There exist a significant potential for PATCs to collaborate with other EC-funded projects on training, as well as with PRACE sister RIs elsewhere in the world, e.g. in the United States or in Japan. These opportunities (and related challenges) will be addressed by the Task 4.4 of the PRACE-3IP project.

During the first two-year period, the centres will gather insight on how a more self-sustaining model of financing can be developed for the PATCs. Possible sources of revenue include course fees, industry (vendor) support and sales of training products. The Task 4.1 of PRACE-3IP will produce a permanency plan on how the PATCs will be transformed into a permanent service under the PRACE AISBL.

6 Appendices

6.1 Appendix 1: PATCs – Call for Hosts

PRACE ADVANCED TRAINING CENTRES – CALL FOR HOSTS

Opening of call:	06-10-2011
Closing of call:	20-10-2011, 1600 CET
Start of operation:	01-01-2012
End of operation:	31-12-2013

Introduction

PRACE Advanced Training Centres (PATCs) aim to "serve as European hubs of advanced, world-class training for researchers working in the computational sciences". They will provide and co-ordinate training and education activities needed to achieve best utilisation of the PRACE research infrastructure by the community. The PATCs are a collaborative effort that represent the whole PRACE community with a common training curriculum, a shared pool of expert trainers and unified training material.

The PATCs will implement a common training curriculum jointly designed and coordinated by PRACE with input from user communities. Each PATC delivers 9–10 training events annually, each for duration of 2–4 days. Some of the training events will be core to the curriculum and offered at every PATC, while others will be specialised courses offered at specific, individual PATCs.

All PATCs will deliver training and associated material in English. The PRACE Training Portal will make available such training material as well as talks in the form of live broadcasts or downloadable recordings. In order to ensure quality of training, PATCs need to continually train the trainers to be skilled, not only technically, but also in how to effectively transfer knowledge.

The locations of three PATCs will be selected in this call and they will operate for two years staring from January 1 2012. No partner centre should host a PATC for more than three two-year terms and only a single PATC may operate in each PRACE member country. Running costs of PATCs will be covered for the duration of the PRACE-2IP project.

Scope of the call

This call is aimed at all PRACE partners. Its purpose is to invite applications for hosting a PRACE Advanced Training Centre for the period of 2012–2013. All interested PRACE partner centres are encouraged to submit an application.

Process

The call is open from 06-10-2011 to 20-10-2011, 1600 CET. All submitted applications are then evaluated and ranked according to the selection criteria. Based on the evaluation, three host centres are to be proposed and subsequently approved by the PRACE executive board (EB). Since the PATCs should be operational from the start of January 2012, the selection process should be completed as soon as possible, by the first EB meeting in November.

Eligility

All PRACE partners are eligible for hosting a PRACE Advanced Training Centre. In order to be selected as a host, a centre needs to have adequate training facilities and resources to meet with the selection criteria as set out below.

How to apply

Applications (in PDF format) are to be sent via e-mail to Simon Wong (simon.wong@ichec.ie) and Martti Louhivuori (martti.louhivuori@csc.fi) no later than 20-10-2011, 1600 CET.

The application should be no more than 3-4 pages long with only a brief description of all the required information (see below) and contact details of the responsible person at the partner centre. There are no strict rules on the layout of the application.

Information required

Brief description of the following items are required in the application:

- training activities in the past two years (e.g. number/type of events, students, themes)
- future training plans
- local trainers and their expertise (brief CVs)
- training venues and facilities
- level of effort commitment to PRACE-2IP WP4 (in PMs)

Proposed added-value services for the PATC network (e.g. training for trainers) or other information that is considered relevant may also be included in the application.

Criteria for selection

The following criteria will be used to evaluate the applications:

- location
  - hosting site must be in a PRACE member country
  - only one PATC per country
  - collectively, PATCs should have a comprehensive geographical and user-base coverage
- capability
  - proven track-record of running a large number of top-class training events consistently over a long period, OR
  - an ambitious future plan combined with an adequate portfolio of trainers and resources to establish a top-class training centre
  - skilled trainers (technical and pedagogical) with expertise to cover all areas of essential HPC training
- facilities
  - computer classroom(s) for 20-30 participants, with reliable network connectivity
  - lounges or other hospitable social areas for breaks and group sessions
  - state-of-the-art educational infrastructure, including
    - the capability to broadcast courses (with AccessGrid, H.323, Adobe Connect Pro, Evo, etc.) and/or record them for subsequent downloads
    - well-equipped workstations, large white screens, powerful projectors etc.
  - flexible, guaranteed (even exclusive) access to the training facilities

Further information

For further information about the call, or PATCs in general, please contact Simon Wong (simon.wong@ichec.ie) or Martti Louhivuori (martti.louhivuori@csc.fi).

More details and the approved "Plan for the Establishment of PATCs" can be found in deliverable D3.2.3 of PRACE-1IP:
   https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/d614877/D3.2.3.pdf

6.2   Appendix 2: PATC Application Score Sheet

Section Criteria (blue = quantitative; red = qualitative)	Scoring Scheme	Range	BSC	CINECA	CSC	GCS	EPCC	PDC	France*
Capability									
1 Ability to carry out large number of events:		[0-5]							
Highest number of training days in a year, from past 2 years.	0.2pt per training day; maximum 5pt (25+ training days)		0	0	0	0	0	0	0
2 Consistency and track record of training activities:		[0-5]	0	0	0	0	0	0	0
Apart from year in criteria 1, evidence for another past year with 25+ training days	+1pt								
Number of participants/students in any one of past two years	Ranking: 1pt for top four; 0pt for others								
Proven track record of international training events in past two years	Ranking: 0pt for no record; 1pt for record; 2pt for top four								
Future training plan that is consistent (within 70%) with previous year in activities	+1pt								
[Note: PATCs should be capable of running 10 events per year; ~20+ participants per event]									
3 Pool of local trainers:		[0-5]	0	0	0	0	0	0	0
Number of local trainers	0.25pt per local trainer specified; maximum 5pt (20+ trainers)								
4 Range of expertise and experience of local trainers:		[0-5]	0	0	0	0	0	0	0
Expertise cover a wide range of HPC topics	Ranking: 3pt for top two; 2pt for next two; 1pt for others								
Level of experience of HPC trainers	Ranking: 2pt for top four; 1pt for others								
5 Effort committed to PATCs (PMs):		[0-5]	0	0	0	0	0	0	0
Number of PMs in WP4	0.5pt per PM; maximum 5pt (10+ PMs)								
[If proposal indicates that in-kind contribution is to be offered, seek clarification and adjust accordingly]									
Facilities									
6 Venue & Infrastructure (classroom capacity >=20):		[0-8]	0	0	0	0	0	0	0
Ability to hold parallel sessions; at least 2 classrooms	+2pt								
Guaranteed classroom access	+2pt								
10+ workstations/laptops in at least one classroom; per site if distributed	+1pt								
Capability to stream, broadcast and record lectures	+1pt / +2pt								
Hospitable lounge, break areas, catering, in-house restaurant	+1pt								
[guarantee access means that when PRACE is ready to schedule PATC events for the upcoming year, it will have priority on venues such that PRACE event can take place on the pre-scheduled date, or at worst, +/- one week]									
Value-Add Services									
7 Extra marks (features/value-add services independent of criteria above, as identified from applications and agreed by reviewers)									
Training for trainers (pedagogical skills)	+1pt (ability to carry out in future) +1pt (past track record of such training)	[0-2]	0	0	0	0	0	0	0
Visualisation	+1pt (equipped with facility) +1pt (past track record of such training)	[0-2]	0	0	0	0	0	0	0
Total			0	0	0	0	0	0	0