PROJECT PERIODIC REPORT

Publishable Summary

Grant Agreement number: 312763

Project acronym: PRACE-3IP

Project title: PRACE – Third Implementation Phase Project

Funding Scheme: Combination of Collaborative projects & Coordination and support actions

Date of latest version of Annex I against which the assessment will be made: 18th June 2014

Periodic report: 1st ☐   2nd ☐   3rd ☒   4th ☐

Period covered: from   1st July 2014   to   30th June 2015

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Project Objectives

Figure 1: PRACE Members and Project Partners

PRACE, the Partnership for Advanced Computing in Europe, has been established as a pan-European Research Infrastructure providing outstanding computing services to enable world-class research on world-class systems. PRACE secured funding from four European countries that committed to host leading-edge computers at the highest performance level in Europe. Twenty-four PRACE members collaborate in the Third Implementation Phase (PRACE-3IP) project, the last project in the series of implementation phase projects for advancing the Partnership for Advanced Computing Research Infrastructure in the 7th Framework Programme. PRACE-3IP supports the accelerated implementation of the pan-European HPC Research Infrastructure (RI) created in April 2010. It continues, complements, and extends the work of the PRACE-1IP and -2IP projects. PRACE-3IP addresses the computational and simulation needs of European scientific communities and of industry to keep them at the forefront of discovery. The overall goal of PRACE is the formation of an integrated HPC ecosystem of facilities and services enabling researchers to realise the full potential of computational science within the supportive environment of the ERA.

The PRACE-3IP project undertakes a joint Pre-Commercial Procurement (PCP) pilot to obtain a solution for a 'Whole System Design for Energy Efficient HPC'. This pilot is the first of its kind on a Europe-wide level and the lessons learned will be invaluable for PRACE in its future procurement strategy and for Europe as a whole in using PCP as a driver for innovation.

PRACE-3IP delivers a broad set of services suitable for use by industry and commerce. The PRACE RI is open for use by SMEs and large European businesses, offering Tier-0 and Tier-1 access, training, and applications support. Applications support and enabling has a bias towards addressing major socio-economic challenges. Best practices are identified, documented and made available to the European HPC community from academia and industry.

PRACE-3IP has a broad training and outreach activity designed to engage more user communities, including industry, in the use of HPC. The next generation of students and researchers are introduced to the benefits of HPC and the technologies and knowledge required applying it successfully in their discipline. PRACE-3IP considerably strengthens and deepens the co-operation between HPC centres, funding bodies and research communities in a mutually beneficial partnership to enhance European scientific and industrial competitiveness.

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Work performed and main Results

Thirty-six months after its start in July 2012 the project has completed most of its work and has achieved all milestones building on the successful work of the First and Second Implementation Phase Projects, except those related to the PCP pilot which is on-going and planned for 48 months. The reporting period M25-M36 has been partially (M25-M31) an extension period for all activities except the PCP. Only selected activities were continued in this period, partially with reduced effort, in order to ensure a smooth transition from the PRACE-3IP project to the new PRACE-4IP project in Horizon 2020.

Joint Pre-Commercial Procurement

The Phase 1 of the execution stage has been completed, the Phase 2 of the execution stage was started where the management of the contract signature was completed.

The Phase 1 of the execution stage ended its activity in March 2015. The Assessment Committee (AC) reviewed successfully the final reports produced by the four vendors BULL SAS, E4 Computer Engineering, MEGWARE, Maxeler Technologies Ltd.

The call for the Phase 2 of the execution stage was issued on 9 March 2015 and ended on 27 April 2015. Three bids from BULL SAS, E4 Computer Engineering, Maxeler Technologies Ltd were received. All three bidders scored positively and have been awarded the Phase 2 contract. The signature of the contracts was completed on 15 June 2015. The Phase 2 is expected to end on 15 April 2016.

Training and Dissemination

Several models for the transformation of the PRACE Advanced Training Centres into a permanent training offer under the PRACE Research Infrastructure were proposed. The PATCs were continued and extended for dedicated training for industrial end users. The series of PRACE seasonal schools was extended by organising two additional seasonal schools. The internship programme Summer of HPC was continued with a reduced size.

Service for Industrial Users

An effective and integrated set of high-level services aimed at the specific needs of industrial users and SMEs, was designed and piloted. The pilot of an Integrated Access Programme (IAP), the SME HPC Adoption Programme in Europe (SHAPE), was implemented and attracted 14 applications out of which 10 were selected. Models and best practices were analysed and legal questions addressed. The first regular SME HPC Adoption Programme in Europe (SHAPE) call was prepared, launched and attracted 12 applications.

Technical Work

The successful operation of six Tier-0 services (JUQUEEN, CURIE, HORNET, SuperMUC, FERMI and MareNostrum) was continued with HERMIT being upgraded to HORNET a CRAY XC40, with a peak performance of 3.8 PFlop/s. In addition to the Tier-0 services, also three Tier-1 systems have been upgraded in capacity, one has been replaced and one site has disappeared from the list. 23 Tier-1 sites are operational at the end of January 2015. The coordination of the activities of the PRACE Security Forum was continued. Several tools and services were evaluated and made available to the PRACE users.

Enabling support for HPC applications codes is provided for applications selected via the PRACE Preparatory Access, through DECI, or may address socio-economic challenges.

These challenges were identified based on the input of the Scientific Case for HPC in Europe (PRACE Scientific Case) with the valuable input of the Scientific Steering Committee.

Expected final results

At the end of the project, the PRACE Research Infrastructure (RI) should have achieved major milestones in its implementation and be able to continue the developed services in a sustainable way – using the results of the work funded through this project:

- Successful execution of the PRACE PCP pilot on a "Whole System Design for Energy Efficient HPC". Lessons learned for the application on PCP in the field of HPC will help to shape PRACE future procurement strategy;
- Stable operation of the distributed Tier-0 and Tier-1 infrastructure with a comprehensive set of common services;
- A rich portfolio of applications especially addressing the socio-economic challenges and users of the Tier-0 infrastructure with close links to Tier-1;
- Six Tier-0 systems in operation, meeting the needs of European users;
- PATC curriculum extended to include training targeted towards the needs of industrial users;
- Pilot of an Integrated Access Programme for industrial users, the SME HPC Adoption Programme in Europe (SHAPE).