E-Infrastructures

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EINFRA-5-2015: Centres of Excellence for computing applications

EoCoE

Energy oriented Center of Excellence for computing applications

Grant Agreement Number: EINFRA-676629

D6.4 - M24

Second annual thematic workshops report - Year 2

Project and Deliverable Information Sheet

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* - The dissemination level are indicated as follows: PU – Public, CO – Confidential, only for members of the consortium (including the Commission Services) CL – Classified, as referred to in Commission Decision 2991/844/EC.

Document Control Sheet

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	Reviewed by:	Edouard Audit, PEC members

Contents

1. Background

Task 6.1.6 of the EoCoE project consists in organisating a series of 9 thematic workshops to present research products to the other project partners. Project partners are expected to propose workshop themes based on outputs from the different work packages. These workshops can also be open to the wider end-user community. In Year 2, five workshops were organized, which are described below.

WP	Workshop	Dates	Place	Registrants	Industrial registrants	Attendees
WP1	Third Thematic Workshop: benchmarking and performance analysis	24th to 27th Of April 2017	Barcelona Supercomputing Centre (Barcelona, Spain)	27	3	28
WP6	HPC summit EoCoE Workshop: HPC for renewable energies	16th of May 2017	Barcelona Supercomputing Centre (Barcelona, Spain)	61	16	40-45
WP6	EoCoE Workshop: HPC for energy applications	15th of June 2017	Clora (Brussels)	40	5	43
WP4	International HPSC TerrSys Fall School	25th -29th Septemper 2017	Bonn University (Bonn, Germany)	30	1	30
WP1, WP2, WP4	Large-Scale Numerical Computations for Sustainable Energy Production and Storage (11th International Conference on Large-Scale Scientific Computations - LSSC'17	6th of June 2017	Sozopol, Bulgaria	N/A	N/A	25-30

Table 1: EoCoE Second Year Workshops

2. Third Thematic Workshop: Benchmarking and performance analysis

2.1 Aims

In a joint effort, the two centres of excellence EoCoE and POP have once again hold a hands-on workshop on HPC benchmarking and performance analysis at Barcelona Supercomputing Centre from 24th to 27th of April 2017. It is the third event of its kind and has been held at BSC in Barcelona and has been supported by the French and the Spanish PATCs.

Improving again an already proven concept, it has brought together 17 experts from topical fields in energy research and tools and 11 experts from HPC science in order to tackle the transition of current R&D codes and applications towards exascale. Most of

the scientific applications welcomed to this edition are not part of the EoCoE consortium. This shows the growing impact of EoCoE on the European HPC ecosystem.

The EoCoE performance analysis methodology has once again passed a new level of maturity. Experts from topical fields could really learn how to use advanced performance evaluation tools, get insight of the performance bottlenecks of their applications and bring back home JUBE based benchmarking tool to repeat, in a reproducible manner, this analysis on future optimised versions of their code.

2.2 Agenda

Monday, April 24th: Torre Girona - Severo Ochoa meeting room

14:00 – 15:45: JUBE – Introduction by Sebastian Luhrs, JZC

15:45 – 16:15: Coffee Break

16:15 – 18:00: JUBE – Integration Hands on I by Sebastian Luhrs et al.

Tuesday, April 25th: Torre Girona - Severo Ochoa meeting room

09:00 – 10:30: Tools Intro: Score-P, Scalasca, Vampir by POP@JSC

10:30 – 11:00: Coffee Break

11:00 – 12:30: Tools Hands-on: Score-P, Scalasca, Vampir by POP@JSC

12:30 – 13:30: Lunch

13:30 – 15:00: Tools Intro: Extrae, Paraver by POP@BSC

15:00 – 15:30: Coffee Break

15:30 – 17:30: Tools Hands-on: Extrae, Paraver by POP@BSC

20:00: Dinner - XupXup Restaurant

Wednesday, April 26th: Torre Girona - Severo Ochoa meeting room

09:00 – 10:30: JUBE – Integration Hands on II by Sebastian Luhrs et al.

10:30 – 11:00: Coffee Break

11:00 – 12:30: JUBE – Integration Hands on II by Sebastian Luhrs et al.

12:30 – 13:30: Lunch

13:30 – 15:00: Benchmarking Hands-on I by All

15:00 – 15:30: Coffee Break

15:30 – 17:30: Benchmarking Hands-on I by All

Thursday, April 27th: Torre Girona - Severo Ochoa meeting room

09:00 – 10:30: Benchmarking Hands-on II by All

10:30 – 11:00: Coffee Break

11:00 – 12:30: Audit by POP

12:30 – 13:30: Lunch

14:00: Departure

2.3 Pictures

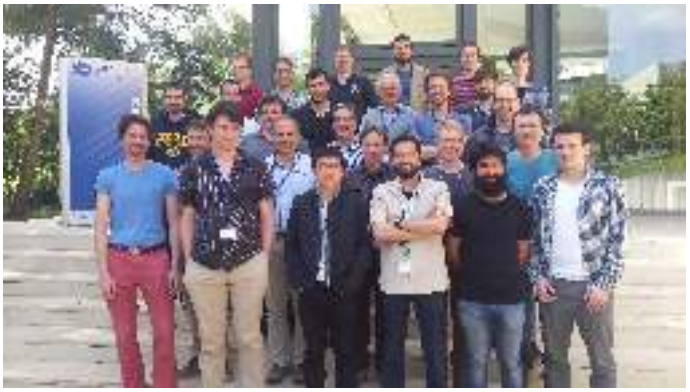

Figure 1: Workshop participants during the third benchmarking workshop

2.4 List of participants

See the list of participants in appendix.

2.5 Core metrics of the Workshop

Date: May 16th 2017

Location: Vertex Building, Campus Nord UPC, Room VS219, Plaza Eusebi Güell, Barcelona, Spain

Number of registrants: 27 (outside EoCoE)

Industrial registrants: 3 from industry

Number of attendees: 28

Codes participating:

WP	Context	Code	Contact	WP1 Contact
5	MHD	TOKAM3X	Patrick Tamain	M. Lobet (MdlS)
2	Weather	WRF-Solar	Constantinos Demetroullas	M. Lobet (MdlS)
2	Wind farms	ALYA	Albert Coca Abello	Y. Ould-Rouis (MdlS)
1	Solver	MUMPS	Philippe Leleux	Y. Ould-Rouis (MdlS)
1	Solver	Maphys	Gilles Marait	Y. Ould-Rouis (MdlS)
ext.	Geothermics	Compass	Simon Lopez	A. Marin-Laflèche (MdlS)
ext.	Geophysics	DIVA	Xavier Lacoste	A. Marin-Laflèche (MdlS)
ext.	Combustion	PARCOMB	Jordan Denev	T. Breuer (JSC)
ext.	CFD	OpenFOAM	Thorsten Zirwes	T. Breuer + S. Luehrs (JSC)
ext.	Material	CP2K	Ari Seitsonen	R. Halver + S. Luehrs (JSC)
ext.	Material	DL_MESO	Jony Castagna	R. Halver (JSC)

Table 2: Codes participating in the third EoCoE benchmarking workshop

3. HPC summit EoCoE Workshop: HPC for renewable energies: new programming models and strategies for the emerging exascale architectures

3.1 Aims

The development of renewable energy generation and storage(REGS) technologies in Europe will require significant advances in simulation capabilities, both to improve physical fidelity by accurately representing the different spatial and temporal scales, and to cope with the increasing amount of data available through monitoring stations. High performance computing is thus becoming an essential tool for the development and optimal deployment of REGS technologies. Harnessing its full potential, on the other hand, requires making efficient use of the upcoming exascale computers (hierarchical architectures with a large number of multicore nodes), and this in turn means that applications need to be significantly modified if they are to reach the expected performance level.

This workshop will review the state of the art in the available programming models that have been proposed for these architectures, focusing on those that enable attaining good performance on a range of different architectures, and have a significant user base. Talks will be given both by the developers of the systems, as well as by advanced user sharing their experience with renewable energy applications from, for example, the areas of wind-, solar-, hydro and geothermal power, nuclear fusion and high-capacity batteries.

3.2 Overview

This workshop took place Tuesday, May 16th, as part of the European HPC Summit Week 2017 in Barcelona (May 15 – May 19, https://exdci.eu/events/european-hpc-summit-week-2017) . A dedicated page for the workshop, including the program and videos of all the talks, can be found here.

The workshop was opened by a keynote addressed, delivered by world renowned specialist Marc Snir. Then came a mix of talks from the applications pillars (showing the performance of an electronic structure calculation software, and of a subsurface flow simulator on modern architectures), and from tools developed or improved as part of the transversal basis of the project (a linear algebra package, and the performance evaluation process for application codes).

The workshop was concluded by a panel discussion, on the topic: The future of CoEs:

How to adapt to disruptive hardware evolutions: common issues to be shared between EoCoE and ESiWACE. As indicated, the discussion was organized jointly by EoCoE and Esiwace, and was moderated by Sylvie Jousseaume. The panelists were Marc Snir and François Bodin (both invited by EoCoE), Peter Bauer and John Goodacre (invited by Esiwace). The panelists discussed how application developers should cope with the fast changing hardware architectures. They emphasized the shift from a single paradigm, dominated by MPI, to a landscape with possibly no dominant single alternative, and stressed the importance of long lived standards from the software life cycle.

The workshop had 61 registrants, of which about 40-45 actually turned up. Both the talks and the discussion were filmed, the recordings are available on the project website, at the link mentioned above.

3.3 Agenda

14:30 - 15h30: Keynote: Programming models for exascale by Marc Snir (University of Illinois at Urbana - Champaign -USA)

15:30 - 16:00: Electronic structure calculations in HPC framework: Solutions for profiling, load-balancing and post-processing by Luigi Genovese (L. Sim - INAC - CEA-France)

16:00 - 16:30: Parallel Linear Algebra Packages: PSBLAS and MLD2P4. Use cases and research results by Salvatore Filippone (Centre for Computational Engineering Sciences, School of Aerospace, Transport and Manufacturing -Cranfield University - United Kingdom)

16:30 - 16:45: Break

16:45 - 17:15: Scalable subsurface flow simulations with ParFlow by Jose Fonseca (Institute for Numerical Simulation, University of Bonn - Germany)

17:15 - 17:45: EoCoE performance evaluation process by Matthieu Haefele (Maison de la Simulation, France)

17:45 - 18:45: Round table - The future of CoEs. How to adapt to disruptive hardware evolutions: common issues to be shared between EoCoE and ESIWACE Panelists: Marc Snir, François Bodin, Peter Bauer, John Goodacre.

3.4 Videos

All the videos of this workshop are available on the EoCoE website.

3.5 List of participants

Not all regitrants actually attended the workshop. A precise list is not available. Between 35 and 40 people actually attended.

See the regitrants list in appendix.

3.6 Core metrics of the Workshop

Date: May 16th 2017

Location: Vertex Building, Campus Nord UPC, Room VS219, Plaza Eusebi Güell, Barcelona, Spain

Number of registrants: 61 (51 outside EoCoE)

Industrial registrants: 16 from industry (including approximately 13 from SMES)

Number of attendees: 40-45

4. Large-Scale Numerical Computations for Sustainable Energy Production and Storage

4.1 Aims

The aim of the special session was twofold:

- bringing together application scientists, applied mathematicians and computer scientists, to discuss numerical and computational issues concerning simulations for low-carbon energy production and storage on high-performance computing platforms, and
- presenting results and perspectives of the EoCoE teams relevant to high-performance scientific computing for applications in the realm of low-carbon energy.

Organizers

Pasqua D'Ambra (IAC-CNR), Daniela di Serafino (University of Campania "L. Vanvitelli"), and Salvatore Filippone (Cranfield University) .

Talks The session was organized in two parts, the first focused on applications in the energy domain, and the second on numerical algorithm and software for the solution of core mathematical problems arising in these applications. The two sessions, each consisting of three talks, were chaired by Pasqua D'Ambra and Daniela di Serafino. The list of the speakers and their talks follows.

1. Henrik Buesing (RWTH Aachen University), Efficient Solution Techniques for Multi-Phase Flow in Porous Media;

2. Jonas Berndt (Jülich Supercomputing Centre), Improving the Short Range Predictability of Wind Energy - An Efficient Parallel Particle Filtering and Smoothing Setup within an Ultra Large Mesoscale Ensemble;

3. Wendy Sharples (Jülich Supercomputing Centre), Performance evaluation of various accelerator enabled linear algebra libraries and booster architectures: Learning through MiniApps;

4. Ulrich Rüde (CERFACS and Erlangen-Nürnberg University), Finite Element Multigrid at Scale for Energy Applications;

5. Daniel Ruiz (Institut de Recherche en Informatique de Toulouse – IRIT), Distributed Solvers: Direct and Iterative Methods for EoCoE;

6. Ambra Abdullahi Hassan (University of Rome "Tor Vergata"), Parallel Aggregation based on Compatible Weighted Matching for AMG.

4.2 Agenda

Special Session: "Large-Scale Numerical Computations for Sustainable Energy Production and Storage: Applications".

Chairperson P. D'Ambra

09:00 – 09:25 H. Buesing, Efficient Solution Techniques for Multi-Phase Flow in Porous Media

09:25 – 09:50 J. Berndt, Improving the Short Range Predictability of Wind Energy - An Efficient Parallel Particle Filtering and Smoothing Setup within an Ultra Large Mesoscale Ensemble

09:50 – 10:15 W. Sharples, Performance evaluation of various accelerator enabled linear algebra libraries and booster architectures: Learning through MiniApps

Special Session "Large-Scale Numerical Computations for Sustainable Energy Production and Storage: Algorithms"

Chairperson D. di Serafino

10:35 – 11:00 U. Ruede, Finite Element Multigrid at Scale for Energy Applications

11:00 – 11:25 D. Ruiz, Distributed Solvers: Direct and Iterative Methods for EoCoE

11:25 – 11:50 A. Abdullahi, P. D'Ambra, D. di Serafino, S. Filippone, Parallel Aggregation based on Compatible Weighted Matching for AMG

4.3 Pictures

Figure 2: Workshop participants during the LSSC 17 conference

4.4 List of participants

4.5 Core metrics of the Workshop

Date: 6th of June 2017

Location: 11th International Conference on Large-Scale Scientific Computations - LSSC'17 (Sozopol, Bulgaria, June 5 - 9, 2017)

Number of registrants: N/A

Industrial registrants: N/A

Number of attendees: 25.

5. EoCoE Workshop: HPC for energy applications

5.1 Aims

Europe is undergoing a major transition, toward a more decarbonised, decentralised, digitised and sustainable energy system. Several workshops/initiatives1 have shown that the energy sector needs vast computing resources to enable and foster this transition. Clearly, this can only be achieved by ensuring close cooperation with High Performance Computing (HPC) experts and centres to optimise and scale algorithms, provide access to new numerical libraries, system software and to provide code-coupling frameworks for existing simulation models. The cooperation is intended to intensify a dialogue between the HPC community and highly interdisciplinary communities involved in research on carbon-free energy production and storage, on micro-scale climate models and on models for terrestrial systems. Discussions should help to clarify the roles of HPC experts, academia and industry and enhance cooperation between the different actors.

Since October 2015, the EoCoE project has undertaken the ambitious task of creating a network of experts with the necessary expertise in carbon-free energy and HPC computing applications. EoCoE reached its proof-of-concept phase and with a strong focus on carbonfree energy sources, would like to share its recent progress and lessons learned while at the same time collecting views on its future scientific and technical challenges. The project EoCoE is a partnership of eight countries and twenty-one partners. Its partners are strongly engaged in both the HPC and energy fields; a prerequisite for the long-term sustainability of the Centre of Excellence EoCoE and for ensuring that EoCoE is deeply integrated in the overall European strategy for HPC and its Clean Energy commitments triggered by the COP21 Paris Agreement. More precisely, the questions we would like to address in the workshop are:

- What are the needs in terms of HPC-related computational expertise in the energy sector at present and in the near future?
- What are the use-cases of HPC applications and what is their potential energy industrial impact?
- Which aspects of such needs would require access to the next generation of HPC systems (exascale) in terms of computation and/or data storage?

The workshop will be held at the CLORA facilities in Brussels (http://clora.eu) on June 15, 2017 from 9:00 to 17:30. There will be talks from experts from both the HPC and the energy sectors as well as ample space for round-table discussions.

5.2 Agenda

- 9h00- 9h30 Andrea Feltrin, EC - European HPC strategy
- 9h30-10h30 Edouard Audit - Presentation of EoCoE
- 10h30-11h00 Coffee break

- 11h00-11h30 Xavier Vigouroux, Atos/Bull – Why HPC applicative services become key ?
- 11h30-12h00 James Coomer, DDN - DDN vision for data-intensive workloads and collaboration with EoCoE
- 12h00-13h00 Lunch
- 13h00-13h30 David Lacroix - AMPEA: The Joint Programme on Advanced Materials and Processes for Energy Applications; General presentation & Projects related to HPC
- 13h30-14h00 Ricardo Bessa on Meteo for energy
- 14h00-14h30 Rolf HUT - WaterCycle, operational global high resolution prediction of river discharge using pre-existing open source components
- 14h30-15h00 Frank Jenko - Modeling for magnetic fusion at the exascale : goals, obstacles and new ideas... (title to be confirmed)
- 15h00-15h30 Holger Ihssen - The need for HPC to support the energy transition : the view of EERA
- 15h30 -16h00 Coffee break
- 16h00-17h00 Round table:
  - What are the needs in terms of HPC-related computational expertise in the energy sector at present and in the near future?
  - What are the use-cases of HPC applications and what is their potential energy industrial impact?
  - Which aspects of such needs would require access to the next generation of HPC systems (exascale) in terms of computation and/or data storage?

5.3 Videos

All the videos of this workshop are available on the EoCoE website.

5.4 List of participants

See the list of participants in appendix.

5.5 Core metrics of the Workshop

Date : 15th of June 2017

Location : CLORA - 8 Avenue des Arts, 1210 Brussels, 9:00 – 17:30

Number of registrants: 40 (8 outside EoCoE)

Industrial registrants: 5 from industry

Number of attendees: 43 (10 outside EoCoE)

6. International HPSC TerrSys Fall School

6.1 Aims

The objectives of this applied course is to provide the theoretical and technical context of terrestrial modeling in high-performance scientific computing (HPSC) environments utilizing stand-alone and coupled hydrologic, land surface and atmospheric models.

Utilizing the Terrestrial Systems Modeling Platform (TerrSysMP), the course will take a complete tour of terrestrial modeling and HPSC in connection with real-world observations and data assimilation including

- setting up a terrestrial model and performing simulations in massively parallel supercomputer environments at the Jülich Supercomputing Centre,
- parallel performance analysis and profiling, parallel data assimilation using TerrSysMP-PDAF (Parallel Data Assimilation Framework),
- and post-processing and visualization in the age of big data.

6.2 Agenda

HPSC TerrSys Fall School 2017 Schedule keynotes, in lecture hall lectures/talks, in lecture hall hands-on sessions in computer lab and library

Monday, September 25, 2017

10:30 – 12:00 Optional tutorial: MPI programming

12:00 – 13:00 Lunch/Arrival and registration

13:00 – 13:20 Stefan Kollet, Wendy Sharples: Welcome – introduction to the Fall School

Introduction to fundamentals of environmental modeling

13:20 – 14:20 Stefan Kollet

14:20 – 16:20 Laura Condon

16:20 – 16:30 Break

Typical characteristics and procedures using HPC resources

16:30 – 17:15 Estela Suarez: Overview of JSC HPC systems

17:15 – 18:00 Ketan Kulkarni et al.: JURECA introduction and first steps

Tuesday, September 26, 2017

Coupled modelling of the terrestrial system

8:30 – 8:50 Wendy Sharples et al.: Fully coupled water cycle simulations with TerrSysMP: Features and applications

8:50 – 9:55 Prabhakar Shrestha and Stefan Kollet: Coupled terrestrial model systems – Using TerrSysMP to develop a quantitative understanding of the soilvegetation-atmosphere interaction

9:55 – 10:05 Break

10:05 – 11:00 Continued

11:00 – 12:00 Eric Maisonnave: OASIS-MCT, a coupler for HPC terrestrial system modelling

12:00 – 13:00 Lunch

13:00 – 15:30 Morning hands-on session continued

15:30 – 16:00 Break

Strategies for handling, processing and visualising big earth sciences data

16:00 – 16:45 Jens Hendrik Goebbert: In-situ big data processing and visualisation

16:45 – 17:30 Martin Schultz: Big data analytics on the background of remote sensing

17:30 – 18:15 Sebastian Luhrs: Parallel I/O and portable data formats

19:30 Fall School dinner at "Buena Vista Havana"

Wednesday, September 27, 2017

Parallel performance and profiling

8:30 – 9:45 Markus Geimer et al.: Introduction to parallel performance engineering

9:45 – 10:00 Break

10:00 – 12:00 Markus Geimer and Ilya Zhukov: Introduction to score-p, scoring and filtering, Cube viewer, tracing and Scalasca with example code.

12:00 – 13:00 Lunch

13:00 – 15:00 Markus Geimer, Ilya Zhukov, Ketan Kulkarni and Slavko Brdar: Performance profiling and analysis applied to ParFlow hydrlogic model: ParFlow reference run; instrumentation and unfiltered; scoring & filtering, filtered profile profile; profile analysis with Cube; fixing the source and rerunning the analysis.

15:00 – 15:30 Break

15:30 – 18:00 Markus Geimer, Ilya Zhukov, Ketan Kulkarni and Slavko Brdar: Performance profiling and analysis applied to ParFlow hydrlogic model cont'd: Weak scaling studies with parflow; coupled model profiling and load analysis; improving load balance and analysis; trace analysis with parflow (if time permits).

Thursday, September 28, 2017

Ensemble data assimilation

8:30 – 10:00 Lars Nerger: Introduction to Ensemble Data Assimilation.

10:00 – 10:15 Break.

10:15 – 11:00 Lecture cont'd

11:00 – 12:00 Wolfgang Kurtz and Stefan Kollet: Ensemble data assimilation with TerrSysMP-PDAF (ParFlow+CLM) (tentative): Introduction to the experiment; compilation of TerrSysMP-PDAF for DA.

12:00 – 13:00 Lunch

13:00 – 15:00 Wolfgang Kurtz and Stefan Kollet: Ensemble data assimilation with TerrSysMP-PDAF (ParFlow+CLM) (tentative): cont'd: different experiments

15:00 – 15:30 Break

15:30 – 17:30 Hands-on session continued

17:30 – 18:00 Stefan Kollet, Wendy Sharples: Official closing – short wrapup and discussion

Friday, September 29, 2017 (optional)

Real data case convection permitting TerrSysMP simulations and continue projects

8:30 – 10:00 Prabhakar Shrestha and Mauro Sulis: NRW TerrSysMP domain, fully coupled real data case simulations, analysis, and visualisation

10:00 – 10:30 Break

10:30 – 12:00 Hands-on session continued

12:00 – 13:00 Lunch

6.3 Pictures

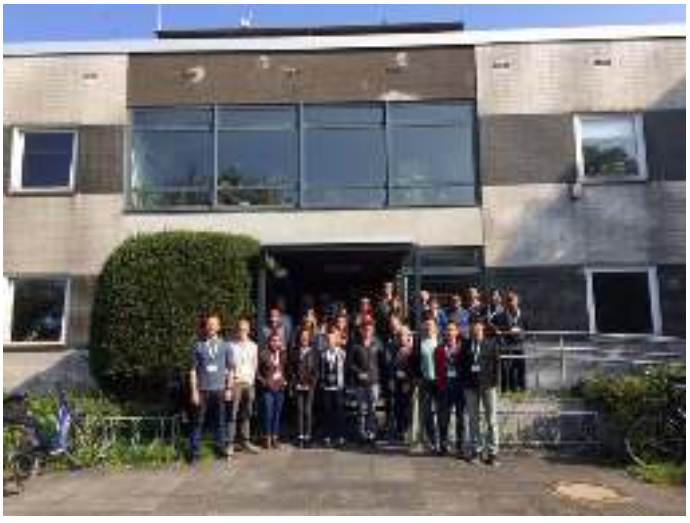

Figure 3: Participants during the HPSC TerrSys Fallschool

6.4 List of participants

See in appendix.

6.5 Core metrics of the Workshop

Date: 25-29 September

Location: Meteorological Institute, Bonn University [Campus Endenich], Auf dem Hügel 20, 53121 Bonn, Germany

Number of registrants: 30

Industrial registrants: 1

Number of attendees: 30

A. Lists of participants

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

EoCoE POP

Attendance list

Name	Entity	Signature
Brian Wylie	FZJ	
Gemàn Llort	BSC	
Ilya Zhunov	FZJ	
Judit Gimenez	BSC	
Matthieu Haefele	CEA	
Paul Gibbon	FZJ	
Sebastian Luehrs	FZJ	
Thomas Breuer	FZJ	
Yacine Ould-Rouis	CEA	
Guillaume Latu	CEA	
Abel Marin-Lafleche	CEA	
Mathieu Lobet	CEA	
Patrick Tamain	CEA	
Jordan Denev	KIT	
Thorsten Zirwes	KIT	
Albert Coca Abello	BSC	
Philippe Leleux	CERFACS	
Matthieu Kuhn	Inria	
Gilles Marait	Inria	
Liang Liang Liang Liang	Idris	
Jony Castagna	STFC	
Ari Seitsonen	IKI	
Alan O'Cais	JSC	
Michel Kern	Inria	
Simon Lopez	BRGM	
Xavier Lacoste	Total	
Lau Mercadal	BSC	
René Halver	FZJ	
Michael Knobloch	FZJ	

During the 3rd Training Workshop EoCoE-POP meeting, BSC-CNS assumes the attendees' lunch costs from 24/04/2017 to 27/04/2017. Therefore, the consortium members attending the meeting whose signature appears above agree to renounce to their corresponding per diem expenses.

Constantinos Demetriou CyI

HPC Summit | EoCoE Workshop | 16th May 2017

HPC for renewable energies: new programming models and strategies for the emerging exascale architectures

NAME, Surname	Institute	Country
Asifuzzaman, Mr. Kazi	Barcelona Supercomputing Center (bsc)	Spain
Atlig, Dr. Cenk	Trakya University	Turkey
Audit, Prof. Edouard	Cea / Maison De La Simulation	France
Balcells, Mr. Jorge	Verne Global	United States
Barbolosi, Mr. Pascal	Cray	France
Bautista, Dr. Leonardo	Barcelona Supercomputing Center	Spain
Becoulet, Dr. Marina	CEA/IRFM	France
Beltrán querol, Vicenç	Barcelona Supercomputing Center	
Bhati, Mr. Agastya P.	University College London	United Kingdom
Cheptsov, Dr. Alexey	Hlrs	Germany
Cho, Dr. Buseung	Kisti	South Korea
Clifford, Mr. John	PRACE	Belgium
Corne, Mr. John	Bright Computing	Netherlands
Doblas-Reyes, Prof. Francisco	BSC	Spain
Ebrahimi Jozani, Ms. Hedieh	Amphos 21 Consulting SL	Spain
Eriksson, Dr. Jerry	Hpc2n	Sweden
Fahringer, Mr. Thomas	University Of Innsbruck	Austria
Falter, Mr. Hugo	Partec Gmbh	Germany
Feltrin, Andrea	European Commission	
Filippone, Dr. Salvatore	Cranfield University	United Kingdom
Fonseca, Mr. Jose A.	Universität Bonn	Germany
Genovese, Dr. Luigi	Cea Grenoble	France
Gibbon, Dr. Paul	Forschungszentrum Jülich GmbH	Germany
Gimenez-Binder, Ms. Renata	Bsc	Spain
Glorioso, Mr. Gerardo	Treelogic	Spain
Gutiérrez, Dr. Albert	Barcelona Supercomputing Center	Spain
Haefele, Dr. Matthieu	Cnrs / Maison De La Simulation	France
Ibáñez, Ms. Sara	BSC	Spain
Ibrahim, Mr. Haroon	Bright Computing	Netherlands
Karasek, Dr. Tomas	IT4Innovations	Czech Republic
Kern, Dr. Michel	Inria / Maison De La Simulation	France
Koh, Dr. Myoung-ju	KISTI	South Korea
Kos, Dr. Leon	University of Ljubljana	Slovenia
Kutka, Mr. Eduardas	Vilnius University	Lithuania
Lamb, Mr. Spencer	Verne Global	United Kingdom
Lee, Dr. Pillwoo	KISTI	South Korea
Lindahl, Prof. Dr. Erik	Stockholm University	Sweden
Mantovani, Dr. Filippo	Barcelona Supercomputing Center	Spain
Mian, Mrs. Umbreen Sabir	Technical University Dresden	Germany
Muggeridge, Mr. Malcolm	Independent	United Kingdom
Nathalie, Mrs. Girard	Cea	France
O'Cais, Dr. Alan	E-CAM Centre of Excellence	Germany
Oorsprong, Ms. Marjolein	Prace	Belgium
Pagonabarraga Moral, Prof. Dr.	Cecam, Epfl	Switzerland
PARIENTE, Mr. FREDERIC	NVIDIA	France
Pitchers, Mrs. Felicity	Ellexus Ltd	United Kingdom
Povh, Prof. Dr. Janez	University of Ljubljana	Slovenia
Puigdomènech, Mr. Pere	Hpcnow!	Spain
Quintana-Orti, Prof. Enrique S	Universitat Jaume I	Spain
Radulovic, Mr. Milan	Bsc	Spain
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Workshop on HPC for Energy applications

Brussels, 15 May 2017

CLORA - 8 Avenue des Arts, 1210 Brussels, 9:00 – 17:30

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HPSC TerrSys Fall School 2017

Terrestrial Modelling and High Performance Scientific Computing

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