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ABSTRACT:
This deliverable describes the outcome of Task 3.1 - Enlarging the SMEs awareness of HPC.
The task aimed to support SMEs and bring them closer to the HPC opportunities, coordinating an action of awareness and diffusion of the HPC benefit and methods, to inform local industry operators and start paths of collaboration that could lead to an optimal "usage" of existing mature initiatives. This was translated into the organization of three workshops in Stuttgart, Milan and Edinburgh at M19, M25 and M31.
This deliverable presents the outcomes of the three workshops and some lessons learnt.

KEYWORD LIST:
HPC, transnational access, research visits, scientific report

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TABLE OF CONTENTS

Executive summary

This deliverable describes the outcome of Task 3.1 - Enlarging the SMEs awareness of HPC.

Leveraging the advantage that all the partners involved in the project are central to a number of SMEs operating in the local area in different domains of production, to support SMEs and bring them closer to the HPC opportunities, HPC-Europa3 coordinated an action of awareness and diffusion of the HPC benefit and methods. It was meant to inform local industry operators and start paths of collaboration that could lead to an optimal "usage" of existing mature initiatives like PRACE SHAPE.

This action did not provide dedicated or special tracks for the access of SMEs to the computing resources of the project; it consisted in the organization of three workshops, at local level, to bring the operators of small and medium enterprises closer to the knowledge of HPC benefits for innovation in production. It also provided pointers to the most suitable initiatives in the field, for their eventual access and better utilization of HPC resources available at European level.

The three workshops were organized in Stuttgart, Milan and Edinburgh at M19, M25 and M31 (MS8, MS9, and MS10 respectively), anticipated by a duly focused publicity to ensure the maximum return of investment.

All the workshop attracted a good number of the target participants, and received very positive evaluation, confirming the achievement of the expected results.

1 Introduction

This deliverable describes the outcome of Task 3.1 - Enlarging the SMEs awareness of HPC.

The task aimed to support SMEs and bring them closer to the HPC opportunities, coordinating an action of awareness and diffusion of the HPC benefit and methods, to inform local industry operators and start paths of collaboration that could lead to an optimal "usage" of existing mature initiatives. This was translated into the organization of three workshops in Stuttgart, Milan and Edinburgh at M19, M25 and M31.

Section 2 presents the outcome of the 1st SMEs Workshop: *Simulation for Automotive Technologies with High Performance Computers* held in Stuttgart on 26-27 November 2018.

Section 3 presents the outcome of the 2nd SMEs Workshop: *HPC for Industry 4.0* held in Milan on 23rd May 2019.

Section 4 presents the outcome of the final SMEs Workshop: *Reducing Barriers to HPC Adoption for SMEs* held in Edinburgh on the 14th May 2019.

A final section (Section 5) presents some conclusions and lessons learnt.

2 The 1st SMEs Workshop: Simulation for Automotive Technologies with High Performance Computers

2.1 General Information

The 1st SME event was organized by the High Performance Computing Center Stuttgart (HLRS) on 26-27 November 2018 for the European SMEs that are focusing on the **Automotive Technologies** domain and having potential interests in exploring the HPC capabilities for their professional activities. The major goal was to discuss the needs of the automotive industry for HPC support with the major focus on the increasing role of SMEs. To achieve this goal, the workshop:

- Brought together representatives of Large Industry, SMEs, and academia at the same table.
- Provided a face-to-face communication platform for sharing by SMEs their experience of HPC usage for early prototyping, developing and industrial promotion of automotive applications, services and solutions.
- Boosted direct communication with representatives of European academia and industry by fostering discussion and round-table talks.

The major benefits for the participating SMEs were to:

- Learn about cutting-edge innovations for automotive technologies like Big Data and Machine Learning
- Learn from the other SMEs who are successful in an industry dominated by large companies
- Get in touch with the leaders in the automotive industry, research, and academia

Workshop's site is permanently available at the link: http://www.hpc-europa.eu/SME_1

Figure 1: Flyer of the 1st SME workshop

2.2 Workshop's program

The workshop was held as a two half-day event with the agenda covering four main sessions (split across both days):

- **SME session**, in which the participating SMEs could share their innovations, present their vision of the future of HPC in the SME domain but also discuss potential problems and seek solutions for them.
- **Industry session**, in which participating industry representatives were giving an overview of their cooperation models with SMEs. Talks from PORSCHE and SCANIA have found a lot of interest by all participants.
- **ISV session**, in which the participating Independent Software Vendors presented their products but also discussed models of SME engagement. For instance, OpenFOAM and ANSYS presentations have attracted a lot of attention, especially by the atteding SMEs.
- **EU R&D Projects session**, in which the most promising solutions from the flagship EU projects were presented.

Simulation for Automotive Technologies with High Performance Computers (HPC)

1st HPC-Europa Workshop for SMEs

26 – 27 November 2018
Stuttgart, Germany

Programme (Day 1) – 26th November

12:45 – 13:30	**Registration, standing reception**	
13:30 –13:40	**Welcome**	*Andreas Wierse (**SICOS**), Alexey Cheptsov (**HLRS**)*
13:40 – 14:10	**Large industry session**	*Rainer Bernhard (**PORSCHE**, **Stuttgart**)* HPC for development of Porsche vehicles
14:10 – 14:40	**SME session**	*Malo Drougard (**AIRINNOVA**, **Stockholm**)* Computer aided design for aircraft
14:40 – 15:10		*Matteo Longoni (**MOXOFF**, **Milan**)* HPC-based Simulation Platform for motorcycle helmets design and development
15:10 – 15:30	**Coffee break**	
15:30 – 16:30	**Large industry session**	*Erik Lönrogh (**SCANIA**, **Stockholm**)* Workshop: Take control over HPC operational costs
16:30 – 17:00	**ISV session**	*Wim Slagter (**ANSYS**)* HPC-Enabled Pervasive Engineering Simulation for Automotive Applications
17:00 – 17:45	**EU R&D projects session**	*Claudio Arlandini (**CINECA**, **Bologna**)* Bringing HPC to the SMEs: the **FORTISSIMO** experience
		*Paul Graham (**EPCC**, **Edinburgh**)* **SHAPE**: Removing barriers to HPC for SMEs
		*Alexey Cheptsov (**HLRS**, **Stuttgart**)* Improve your HPC experience by visiting experts in your field with the **HPC-Europa3** transnational access program. Fostering heterogeneity with **PHANTOM**
18:00 – 21:15	**Social event and dinner** We are visiting the MOTORWORLD exhibition and meeting afterwards in the "Das Wichtel" restaurant to discuss the workshop result in the less formal atmosphere.	

Figure 2: Agenda day 1

Simulation for Automotive Technologies with High Performance Computers (HPC)

1st HPC-Europa Workshop for SMEs

26 – 27 November 2018
Stuttgart, Germany

Programme (Day 2) – 27th November

09:30 – 10:00	**Infrastructure session**	*Bastian Koller (**HLRS**, **Stuttgart**)* Supercomputing in Germany and EU. Overview of HLRS
10:00 – 10:30	**ISV session**	*Roger Almenar (**ESI Group**, **Munich**)* Realizing the potential of OpenFOAM
10:30 – 10:45	**Coffee break**	
10:45 – 11:15	**SME session**	*Benedetto Risio (**RECOM**, **Stuttgart**)* Genetische Algorithmen im HPC als Werkzeug zur Weiterentwicklung emissionsarmer Feuerungstechnologie für die Industrie
11:15 –11:45		*Bartosz Gorecki (**QueckerSim**, **Warsaw**)* HPC simulations on CPUs and GPUs in Fluid Dynamics
11:45 –12:30	**EU R&D projects session**	*Jose Gracia (**HLRS**, **Stuttgart**)* **CoE-POP**: performance analysis and optimisation as a service
		*Lykle Voort (**SURFsara**, **Amsterdam**)* **NOMAD:** *A gateway to efficient Machine Learning*
		*Andreas Ruopp (**HLRS**, **Stuttgart**)* **Excellerat:** A Center of Excellence for Engineering Applications
12:30 –13:30	**Closing and standing lunch**	

Figure 3: Agenda day 2

2.3 Participants information

The workshop succeeded to attract a good number of attendees:

- 7 SMEs representatives
- 8 participants from other industries
- 10 academic members

who represented in total 7 European countries.

The evaluation, obtained through a questionnaire at the end of the workshop, revealed a high acceptance rate by all groups of attendees – over 90% of attendees found the workshop useful for them and all without exceptions will recommend it to the colleagues and associates.

Figure 4: Talk of AIRINNOVA (Swedish SME)

3 The 2nd SMEs Workshop: HPC for Industry 4.0

3.1 Description

The workshop was organized in Milan in May 2029 and aimed to present the state-of-the-art of Industry 4.0 technologies, in particular presenting methods and techniques that might be used to transform a manufacturing plant into a plant 4.0. The programme focused on the relation among High Performance Computing (HPC), Artificial Intelligence (AI), Big Data and visualization: the basic ingredients to create a digital twin of a 4.0 factory.

Taking into consideration a remote manufacturing plant, a digital twin is a cyber replica of the plant that allows operation technology to be digitalized allowing a large amount of data from the plant's sensors to be collected and analysed with HPC, so to simulate and forecast the plant behaviour. Furthermore, with AI automatic decisions can be taken to optimize the production and the management can visualize with a convenient dashboard or with virtual reality what is happening in real-time in the remote plant.

The workshop was organised around five sections, each covering one of the themes mentioned, and associated with a question to which the presenters provided answers. The first two days (21-22 May 2019) were organised in collaboration with the PRACE-6IP EU project. The last day (23rd May 2019) was totally organised by HPC-Europa3 and dedicated to SMEs, aiming to present the advantages in the use of HPC and related technologies. The question for the last day was "**Can HPC help my SME grow?**"

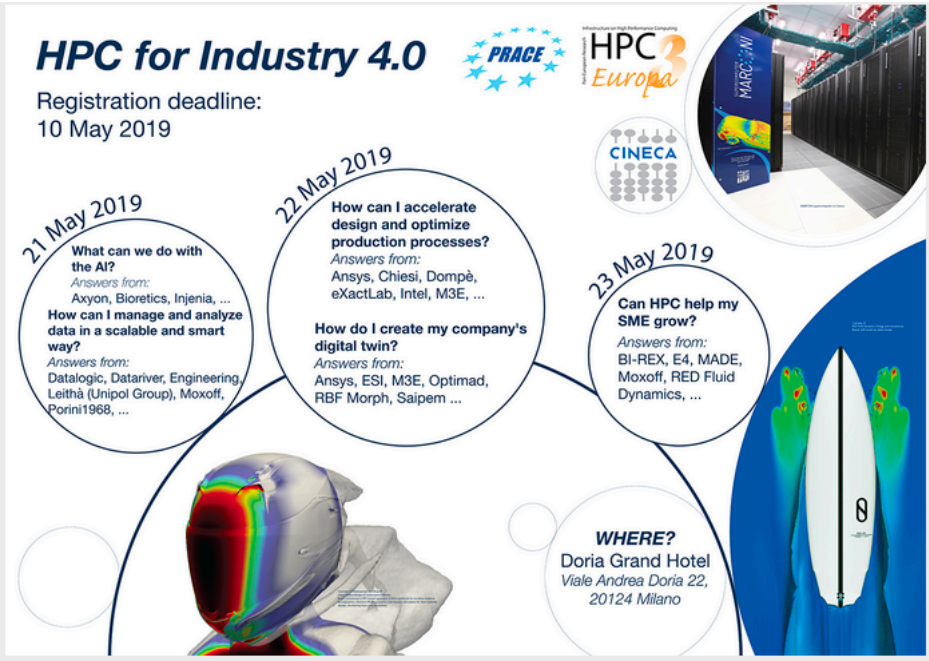

Figure 5: Flyer of the 2nd SME workshop

3.2 Agenda of HPC-Europa3 day

To answer the specific question of the track we tried to combine different contributions in the same day:

- large companies that are success stories of using HPC in their business environment (e.g. NOKIA);
- researchers who involve small companies in EU projects (LINCON, MAX);
- representative of two of the eight Italian Competence Centres for Industry 4.0 created in 2018 (MADE and Bi_REX) that were born to create an ecosystem between research and companies;
- SMEs (E4, RED Fluid Dynamics) that use or develop HPC tools.

In addition, in order to increase the visibility of the project, two HPC-Europa grant holders were also asked to give evidence of their experience.

23 may	Company	Speaker	Title
9:30	CINECA	Claudio Arlandini	HPC resources: opportunities to access them
10:00	RED Fluid Dynamics	Riccardo Rossi and Enrico Bezzi	HPC for Industry 4.0: the case of the ARES Design Panther ProgettoUno
10:30	MADE	Prof. Sergio Terzi	MADE: Competence Center
11:30	Moxoff	Matteo Longoni	Making the most of mathematics for innovation
12:00	LINCON	Lucia Ramundo	Maritime 4.0: opportunities from digital technologies adoption
12:30	Nokia	Chiara Rampini	Data scientist profiling at a glance
14:00	E4	Fabrizio Magugliani	Why HPC is key for the competitiveness of the industry
14:30	EPCC	Gavin Pringle	Fortissimo Marketplace: Industry4.0 experiments in HPC
15:00	UNIBS	Prof. Alberto Salvadori	HPC simulations of batteries
16:00	Bi-rex	Stefano Cattorini	BI-REX (Big Data Innovation & Research Excellence)
16:30	HPC-EU3	Federico Perini	Leveraging HPC technology for faster simulations of engine combustion
17:00	Max - CNR	Prof.ssa Elisa Molinari	MaX: screening and designing materials with HPC

Table 1: Agenda of the 2nd SME workshop

3.3 Participants of HPC-Europa3 day

The public of the workshop was quite heterogeneous. Taking into account the speakers, we have 18 participants from industry or industry associations, 7 research staff from polytechnic institutes, 9 university researchers and 4 from other institutions. As expected at an industry conference, most of

the participants came from the host country, which highlights a low level of European industrial mobility. In the table below the list of participants:

Name	Title	Institution
Ahmed Aissa Berraies	Mr.	Universita degli studi di Pavia
Alessandro Bardelli	Mr.	TXT e-solution
Alessandro Pizzoferrato	Ing.	Epta Refrigeration
Andrea Curotti	Dr.	Freelance software developper
Andrew Emerson	Dr.	Cineca
Carlo de Falco	Prof.	Politecnico di Milano
Claudio Airatti	Dr.	Politecnico di Milano
Diego Modonutti	Mr.	politecnico di milano
Domenico Guida	Mr.	ART-ER
Emidio Laterza	Dr.	Bitbang srl
Fabio Gabas	Dr.	Università degli Studi di MIlano
Filippo Carone Fabiani	Dr.	Università di Bergamo
Francesca Perino	Mrs.	MathWorks srl
Giancarlo Mauri	Prof.	Univ. Milano-Bicocca
Gianluca Bertaina	Dr.	Università di Milano
Giovanna Camorali	Ms.	IBM
Luca Paglieri	Dr.	Politecnico di Milano
Matteo Fontana	Mr.	Politecnico di Milano
Maurizio Cremonesi	Mr.	CINECA
Melchiorre Danilo Abrignani	Dr.	Leitha srl
Nuno Lopes	Prof.	Polytechnic Institute of Cávado and Ave
Roberto Leporini	Dr.	Università di Bergamo
Silvano Coletti	Mr.	Chelonia Applied Science
Timo Felser	Mr.	University Padova and University of Saarland
Tommaso Benacchio	Dr.	MOX
Valeriano Borga	Mr.	Tim s.p.a

Table 2: Participant list of the 2nd SMEs worshop

3.4 Materials

All workshop materials, including the previous days, are available for download on the website:

https://events.prace-ri.eu/event/834/attachments/945/1592/go

3.5 Comments and evaluations from participants

In general, the participants appreciated the workshop, the general average evaluation being 7.95/10 while 86.36% found the presentations clear and understandable. We consider these results as very good considering that we mixed participants from two very different worlds: research and industry. The type of presentation these two classes of participants expect is indeed quite different, industrial representatives usually expect overviews or in some way commercial talks, while researchers prefer very in-depth technical discussions.

The climate was very friendly and relaxed, many questions were asked during the speeches and the breaks were an opportunity to exchange contacts and ideas between researchers and industry, as well as between the industries themselves.

The event was a success from the point of view of a technological update, and also of quality networking. We recommend a repetition of the event considering other geographical locations, to spread the connection among research and local industries.

4 The 3rd SMEs Workshop: Reducing Barriers to HPC Adoption for SMEs

4.1 Description

This workshop was focused to show SMEs how the HPC-Europa programme is specifically designed to facilitate the uptake of High Performance Computing (HPC).

It is an accepted fact that many SMEs rely on modelling/simulation or big data analytics for their business and could benefit from access to HPC. However, the cost of owning and maintaining an HPC system to perform simulations is simply not affordable for most, if not all, SMEs. Moreover, many SMEs do not have the necessary expertise on site to exploit HPC, whether it is on-site or in the Cloud.

As computers become more powerful, the benefits they can offer within both the academic and business sectors become more apparent. It is clear that the ability to perform advanced simulations is becoming more and more important. Therefore, the HPC-Europa3 programme can support businesses, which otherwise could not afford to run advanced simulations, acquiring the necessary competences, tools and access.

This workshop presented an overview of HPC for both simulations and big data analytics, and introduced gave guidance on how to submit a successful HPC-Europa3 proposal.

It was also the opportunity to promote HPC in general, but also EPCC and its HPC facilities and to publicise the PRACE SHAPE initiative, also directed to SMEs. The agenda included five talks from speakers from SMEs describing how HPC has benefitted their business and/or how HPC-Europa3 funding helped with their research.

The workshop was held over one day, on Thursday the 14th of November 2019, in a very pleasant room on the top floor of The Bayes Centre, in the centre of Edinburgh's Old Town.

4.2 Workshop Agenda

	Company	Speaker	Title
10:00	EPCC	Gavin Pringle	What is HPC and what EPCC can offer
10:30	EPCC	Catherine Inglis	HPC-Europa3: EC funding for research visits using High Performance Computing
11:30	EPCC	Chris Johnson	SHAPE: Helping SMEs onto the HPC ladder
12:00	Optic Earth	Stephanie Earp	From Academia to Start-up: HPC in Geophysics
14:00	Cognitive Geology	Lucy MacGregor	The Impact of Machine Learning in Earth Sciences
14:30	Global Surface Intelligence	Mark Howie and Alexey Tarutin	The Role of HPC in Deriving Near Real-Time Geospatial Analytics from Satellite Data
16:00	airinnova	Mengmeng Zhang	Innovation in Aircraft Design via National and International Collaborative Research using HPC
16:30	University of Sheffield	Alberto Marzo	Commercialisation of HPC tools for Personalised Medicine

Table 3: Agenda of the 3rd SMEs workshop

4.3 Talk Titles, Speaker, and Abstracts

- Title: "**What is HPC and what EPCC can offer**", Speaker: **Gavin Pringle**

- Title: "**HPC-Europa3: EC funding for research visits using High Performance Computing**", Speaker: Catherine Inglis

- Title: "**SHAPE – Helping SMEs onto the HPC ladder**", Speaker: **Chris Johnson**. Abstract: "SHAPE (SME HPC Adoption Programme in Europe)[1], is a pan-European initiative supported by the PRACE (Partnership for Advanced Computing in Europe) project. Getting SMEs to adopt HPC can be challenging. There are a number of barriers to HPC adoption by SMEs such as a lack of in-house expertise or a lack of available manpower. SMEs may have little or no access to suitable hardware, and an SME may be unwilling to take on the risk of committing to HPC without prior experience. By utilising HPC, an SME has the potential to improve product quality via an enhanced performance and accuracy of their models, or by reducing time to delivery, or by providing innovative new services to their customers. Ultimately this can increase their competitiveness. The SHAPE programme was set up to help SMEs overcome the barriers they face, allowing them to get a foot on the HPC ladder. Through a series of regular calls, SMEs can apply for assistance from SHAPE via a lightweight application process. Successful applicants to the programme are paired with an expert from a PRACE partner institution who helps them try out their ideas for utilising HPC to enhance their business. In addition, SMEs are given access to suitable PRACE supercomputing systems. A typical project could involve the porting or parallelisation of the SME's code to allow running on an HPC system, getting an SME up and running with a code already installed on an HPC system, or could involve optimising an already running code for the SME's specific use case: http://www.prace-ri.eu/shape-white-papers/. Since 2013, 45 SMEs across Europe have been awarded effort from the SHAPE programme to assist with making use of HPC for their business. Successful SHAPE projects have come from a diverse range of subject areas, including some less traditional HPC areas such as finance and medicine. This talk will give a short introduction to the SHAPE programme, including some of the success stories from the SMEs across a variety of disciplines that have worked with PRACE."

- Title: "**From Academia to Start-up: HPC in Geophysics**", Speaker: **Stephanie Earp**. Abstract: "Geophysicists create images of the Earth's subsurface just like doctors use images to see inside patient's bodies. This involves collecting large amounts of complex data that need to be processed and sorted to create interpretable images. As well as involving large quantities of data, many of these processes are computationally intensive so a lot of computational power is needed to produce the images in a reasonable time-scale. This talk will show how HPC was used during research in applying machine learning to reduce compute time of imaging in geophysical problems and then discuss the importance of access to HPC resources at the beginning of a start-up."

- Title: "**The Impact of Machine Learning in Earth Sciences**", Speaker: **Lucy MacGregor**. Abstract: "The oil and gas industry is awash with data, in the form of wells, seismic and other geophysics data, geological information and production data among other things. However, the industry is notoriously poor at utilising this information. The complexity of

[1] http://www.prace-ri.eu/hpc-access/shape-programme

workflows required to take raw information available in public or proprietary data stores and turn this into decision ready models of sub-surface geology and properties means that such workflows are time consuming. As a result, often only a fraction of the available information is used. The resulting sub-surface models are often fraught with uncertainty, and this uncertainty impacts the decision-making process for reservoir exploration, appraisal and development. Making better use of information, using modern data analytics techniques, and presenting this information in a way that is immediately useful to geologists and decision makers has the potential to dramatically reduce time to decision and the quality of the decision being made. Here we explore some of machine learning approaches that have been applied to sub-surface interpretation in the past, and look to potential future applications."

- Title: "**The Role of HPC in Deriving Near Real-Time Geospatial Analytics from Satellite Data**", Speakers: **Mark Howie and Alexey Tarutin**. Abstract: "Scotland is well-placed to benefit from the growth in the space industry, particularly the generation of geospatial analytics from satellite data. Whilst GSI (Geographic Information Systems) and remote sensing have been around for a number of decades, the application of machine learning to satellite data is only now becoming practical at large scale. This talk will look at our experience at Global Surface Intelligence, where HPC is the key enabler as we generate near-real time production-level business information for our clients through an automated tool set. Without an effective HPC service we would not be able to offer large-scale products at high resolution."

- Title: "**Innovation in Aircraft Design via National and International Collaborative Research using HPC**", Speaker: **Mengmeng Zhang**. Abstract: "This talk is about the current trend and outcomes in aircraft design within EU research projects involved by Airinnova AB using large-scales and high-fidelity simulations with the help of HPC. The aircraft design, especially for novel configurations, requires both fast iteration and acceptable accuracy in the early design stage to save money and time. The high-fidelity simulations and Multi-Disciplinary Design and Optimization (MDO), whose aim is to build a "virtual aircraft" which balances all disciplines, are the primary and most advanced tools nowadays used in the aircraft design industry. Airinnova AB will share its experience with a most recent EU project AGILE for aircraft design and MDO, as well as a number of its external and internal projects. All of them were made full use of HPC resources and a significant part of the HPC resources for AGILE and other projects were powered by HPC-Europa3."

- Title: "**Commercialisation of HPC tools for Personalised Medicine**", Speaker: **Alberto Marzo**. Abstract: "The 'grand plan' for *in silico* medicine - conducted by means of computer modelling or simulation (alluding to silicon semiconductors) - is the creation of a complete mathematical representation of human physiology (a virtual human) that encompasses the entirety of the anatomy, and permits the simulation of any combination of physiological and pathological processes, for the purposes of furthering knowledge, developing healthcare solutions (including treatments), improving clinical practice through stratification and personalised care, and support industry and the regulatory bodies. In full alignment to this ambition, the CompBioMed project is a EU H2020 funded Centre of Excellence focussed on the use, development, and commercialisation of computational methods for biomedical applications. Dr Marzo will give a summary of how the use of HPC

has supported the CompBioMed applications along their route to commercialisation, and how Dr Marzo's research in cardiovascular modelling benefited from HPC-based methods."

4.4 Participants

In total, this workshop had 30 attendees including 19 individuals from 16 SMEs.

First Name	Surname	Institution	SME	Speaker	Project staff
Ian	Allaway	Wallscope	Y		
Alexey	Cheptsov	HLRS, Stuttgart, Germany			Y
Stephanie	Earp	Optic Earth	Y	Y	
Sam	Fleming	CarboMap	Y		
Juan	Herrera	EPCC			
Mark	Howie	Global Surface Intelligence	Y	Y	
Ross	Hunter	Armadilla (4 attendees)	Y		
Catherine	Inglis	EPCC		Y	Y
Chris	Johnson	EPCC		Y	
Ifeyinwa	Kanu	IntelliDigest	Y		
Jane	Kennedy	EPCC			
Iain	Kinnell	Historic Environment Scotland	Y		
William	Lucas	EPCC			Y
Lucy	MacGregor	Cognitive Geology	Y	Y	
Andreas	Malekos	Continuum Industries	Y		
Alberto	Marzo	University of Sheffield		Y	
Jordi	Mas	BSC			Y
Alex	McIntosh	Tradeinspace	Y		
Gavin	Pringle	EPCC		Y	Y
Elaine	Pritchard	Peak Consultancy	Y		
Alin	Radu	Gobal Parametrics	Y		
Gordon	Rates	AIRNODE	Y		
Alexey	Tarutin	Global Surface Intelligence	Y	Y	
Nicolas	Tonello	Contsel Com	Y		
Lykle	Voort	SURFsara			Y
Mengmeng	Zhang	Airinnova, Sweden	Y	Y	
Shiyao	Zhang	Informatics, UoE			

Table 4: Participant list of the 3rd SMEs workshop

4.5 Materials

The overview of the workshop is available here: http://www.hpc-europa.eu/HPC_Adoption_Workshop, whilst all workshop materials, including the agenda, abstracts and (where available) the slides, are available for download here: http://www.hpc-europa.eu/workshop_agenda

4.6 Comments and evaluations from participants

A SurveyMonkey was setup to collect feedback from everyone involved with the workshop, and around 50% responded. The unedited full responses may be found here: https://www.surveymonkey.com/results/SM-HFSYQMSS7/

In summary, all respondents said the workshop was good (5%), very good (30%) or excellent (65%). All respondents said the workshop was either very well organised or extremely well organised; and was either very helpful or extremely helpful. Regarding the HPC-Europa3 funding opportunity, four said they would apply for funding soon, while five reported they were interested but not at present; on the other hand, two reported they do not need funding from HPC-Europa3 at this time, and three were satisfied with competing products currently available.

What follows is arguably the most important feedback, namely the full unedited feedback from the all three of the *non-speaker* SME respondents (unanswered questions are not included below for the sake brevity).

- SME Respondent 1
  - Overall, how would you rate the event?
    - Excellent
  - What did you like and what did you dislike about the event?
    - Explanation and case studies
  - How organized was the event?
    - Extremely organized
  - How helpful was the content presented at the event?
    - Extremely helpful
  - Are you likely or unlikely to exploit HPC-Europa3's funding opportunity?
    - Will apply for funding soon
  - What is the name of your company and where are you located?
    - AirNode
- SME Respondent 2
  - Overall, how would you rate the event?
    - Excellent
  - What did you like and what did you dislike about the event?
    - Well run with a very topical line up of presentations. Good opportunity to meet with EPCC organisers and with fellow attendees as well. Very good facilities and excellent catering as well!
  - How organized was the event?
    - Extremely organized
  - How helpful was the content presented at the event?
    - Very helpful
  - Are you likely or unlikely to exploit HPC-Europa3's funding opportunity?
    - Will apply for funding soon
  - What is the name of your company and where are you located?
    - Constelcom Ltd, London, UK
  - If willing, please provide a short blog post regarding the event.
    - Thank you Gavin and EPCC for organising this informative event and providing us with a direct opportunity to meet people who run the program and with people who have benefited from the funding
- SME Respondent 3

- Overall, how would you rate the event?
  - Excellent
- What did you like and what did you dislike about the event?
  - It was very informative, engaging and lots of opportunity to network
- How organized was the event?
  - Very organized
- Was there any information that would have been helpful to know before the event?
  - Not applicable
- How helpful was the content presented at the event?
  - Very helpful
- Are you likely or unlikely to exploit HPC-Europa3's funding opportunity?
  - Will apply for funding soon
- What is the name of your company and where are you located?
  - IntelliDigest Ltd, Edinburgh, Scotland, UK
- If willing, please provide a short blog post regarding the event.
  - It was a great opportunity to understand better the support available through EPCC for HPC Europa.

In EPCC's experience, the most appreciated part of any workshop are the breaks (coffee and lunch), as it gives attendees the opportunity to network and exchange ideas. This workshop was no exception and the atmosphere was welcoming and open, even if the SMEs kept their own research findings close to their chests.

The presentations were targeted to an SME audience, learning from previous workshops so that the SMEs gave more technical detail than their usual commercial presentation, whilst the academics presented a higher level of abstraction than typical of academics. The audience were comfortable enough to feel they could interrupt with questions, and all speakers were happy to oblige.

To the author, the most interesting comment from an SME participant, asked during the HPC-Europa3 presentation Q&A, was that they did not do "research" per se and as such, they felt they did not quality to apply for HPC-Europa3 funding. After a general discussion, it was agreed that SMEs do perform research but that they consider it a "development" of ideas. As such, perhaps HPC-Europa3 can alter their advertising in the future.

Lastly, separate to the survey, two of the speakers from SMEs took time to email the Workshop's Organiser directly:

- "Thank you very much for organising such a useful workshop. I found it to be very welcoming and collaborative", Mark Howie, Chief Engineer, Global Surface Intelligence.
- "Many thanks for inviting me to the HPC Europa event - it was a very enjoyable day…", Lucy MacGregor, Chief Technology Officer, Cognitive Geology.

4.7 Photographs

Figure 6: Photos from the 3rd SMEs workshop

These photos were taken near the start of the workshop, before the remaining attendees had arrived.

5 Conclusion

The action was a clear success both in term of participation number of the targeted attendees (SMEs employees), and in term of value provided to them, as collected from the personal feedback and evaluation questionnaires.

A certain number of conclusions and lessons learnt may be drawn from these experiences, that might be precious in term of exploitation for the projects partner:

- Presenting success stories of SMEs innovating with HPC is a particularly powerful dissemination method.
- HPC centres must appear as vendor-agnostic innovation partners, able to put a SME in the condition to tale informed choice about technologies and investments to be made for their individual innovation path.
- Each SME is different and no “one-size-fits-all” solutions might be applied. Dealing with a SME requires then lengthy discussions, and deep knowledge of the SME application field is often necessary. This is particularly challenging for the HPC centres, and therefore the role of third-party partners that might as a bridge needs to be carefully evaluated.
- The role of the HPC centres as partners able to support SMEs in obtaining funding opportunities (like participation in H2020 projects) is particularly appreciated, since it eases the investment necessity in the first evaluation steps of an innovation path.