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DEEP-ER

DEEP Extended Reach

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Final report on dissemination and training

Approved

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Executive Summary

This deliverable reports on the activities and achievements of Work Package 2 “Dissemination, outreach and training” of the DEEP-ER project during the final project phase or respectively since the last WP2 deliverable, which is from October 2015 to March 2017. In addition, it critically reviews the activities over the whole project period and gives an outlook on post-project measures planned to date.

Taking into consideration the recommendations from the last two project reviews in December 2015 and in June 2016 as well as our own communication goals for this period, we have focussed on the following aspects in the last 1.5 years:

- Continuing SEO optimisation for the website;
- Publishing success stories on the website on applications and co-design as well as creating new content for the website on a regular basis;
- Keeping up the cross-media synergies between website and social media channels;
- Continue community building together with the other European Exascale Projects (CRESTA, EPiGRAM, EXA2CT, Mont-Blanc and Numexas);
- Extending media relations and nurture contacts to social media influencers for increased impact;
- Collaborating with DEEP-ER consortium partners on marketing activities;
- Offering trainings and workshops with a focus on making these accessible to interested audiences outside the project.

Across the whole project timeframe, the activities resulted in quite impressive numbers: DEEP-ER partners have organised and/ or participated in 23 trainings and workshops. Media relations resulted in over 50 (quality) pieces of coverage in key HPC media and the website attracted close to 41,000 unique users and reached 330,000 page visits over the last 3.5 years. 8 peer-reviewed scientific papers were published (with another one currently under review) and more than 60 presentations held at different scientific workshops, conferences and events. Either with its own booth or via partner marketing, DEEP-ER was present at 10 trade fairs and exhibitions. Last, but not least, the members joined numerous networking events and events by (industrial) lobby organisations like ETP4HPC and PROSPECT.

Taken together, all these initiatives helped us to reach our main goals for this work package. These were a) to disseminate the achievements of the DEEP-ER project to major HPC stakeholders and the European scientific communities; b) to liaise with European industry and research organisations and c) to implement a targeted education and training program to distribute the know-how gained in the DEEP-ER project.

The team is going to continue outreach activities after the official project end. In the near future, these activities include the dissemination of a final press release as well as distributing the final project brochure (print and the web-version via social media). In addition, the results will be communicated by the WP2 leader BADW-LRZ and project management lead JSC in a joint effort at their booth at ISC'17. Finally, all the project's communication channels (website and social media) will be kept, continued and adapted for the follow-up project DEEP-EST to start in summer 2017.

1 Introduction

The three main objectives of WP2 are (a) disseminating the achievements of DEEP-ER to major HPC stakeholders and to the European scientific community; (b) the liaison with European industry and research organisations; as well as (c) the implementation of a targeted education and training program.

In this deliverable, we give an overview on the activities in these three fields since the last deliverable dating back to September 2015. We then critically review these activities over the whole project time frame. Whereas the whole chapter 2 describes efforts related to the objective (a) dissemination, chapter 3 presents the activities concerning objective (b) liaison activities. The report continues in chapter 4 with an overview on training and education as required by task (c) and concludes with chapter 5 which provides a critical summary and an outlook on post-project efforts.

2 Task 2.1: Dissemination activities

2.1 Dissemination Plan & Strategy – A Review

In D2.2 we refined the initial dissemination plan and developed a clearer strategy for our dissemination activities with the intention of thus being able to increase the impact of our measures. In short, we decided to focus on a communication mix of owned media (website, social media, brochures) and earned media (relations to traditional media and social media influencers). When deemed appropriate and useful we were open to paid media (e.g. advertorials). Additionally, being present at and (co-) organising events, conferences, and workshops complemented our outreach activities as these allowed us to extend mediated communication by more personal communication with our target groups. We proved in the consecutive deliverables and reviews, that this refined strategy was the right approach to follow and to develop further. Current trends and numbers presented in 2.2 website, 2.3 social media, 2.4 events and 2.6 media relations prove this still to be true. This very first overview on total numbers (see figure 1) for all dissemination areas already suggests this.

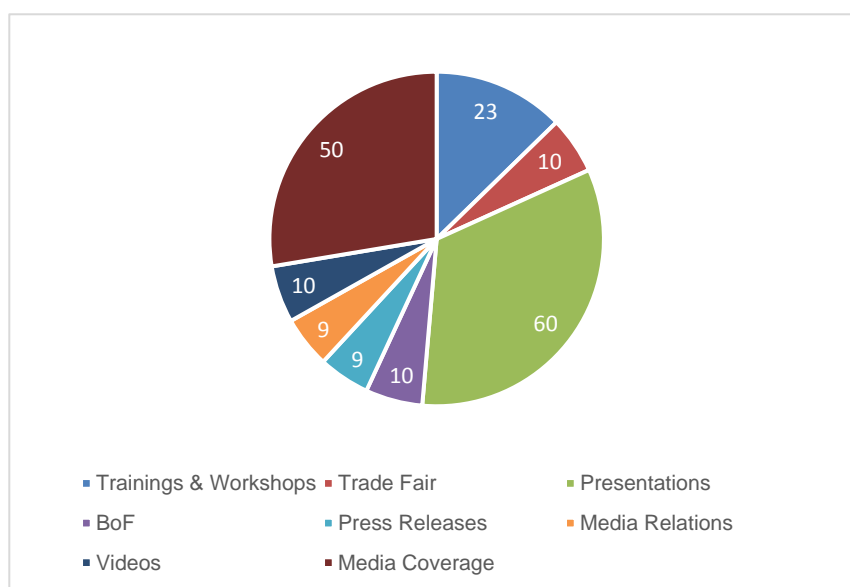


Figure 1: DEEP-ER dissemination activities in total numbers

In particular, the increased focus on creating and disseminating our own content via our own channels has proven to be extremely useful – above all when considering the tight cross-promotion between website and social media. To give just one example: in the timeframe since the last deliverable, we have tremendously extended the content on applications, not only talking about the DEEP-ER co-design applications but providing information in general on how application developers can benefit from an architecture like the DEEP-ER one etc. This was flanked with a mini-campaign on Twitter, which in turn drew attention to the website content. Both the website and Twitter have flourished above expectations in this respect.

An important aspect that contributed to this was the facelift of the website, which was finalized in summer 2015, and the search engine optimisation (SEO) that went along with it. Both measures helped to make the website more appealing to users as well as easier to find on the web.

With respect to the facelift, three aspects were important (for details on the facelift see D2.3):

- Develop a more modern design.
- Safeguard a stringent and unified appearance towards our target communities across all our owned media: website, but also social media, flyers, brochures.
- Work out a joint branding with the predecessor DEEP project.

Figures 2 to 4 demonstrate well how these aims were realized. These three aspects still guide our dissemination activities today. The latter one will come into play again soon, when we will adapt our channels to also communicate on the follow-up project DEEP-EST.



Figure 2: Website new (left) vs. website old (right)

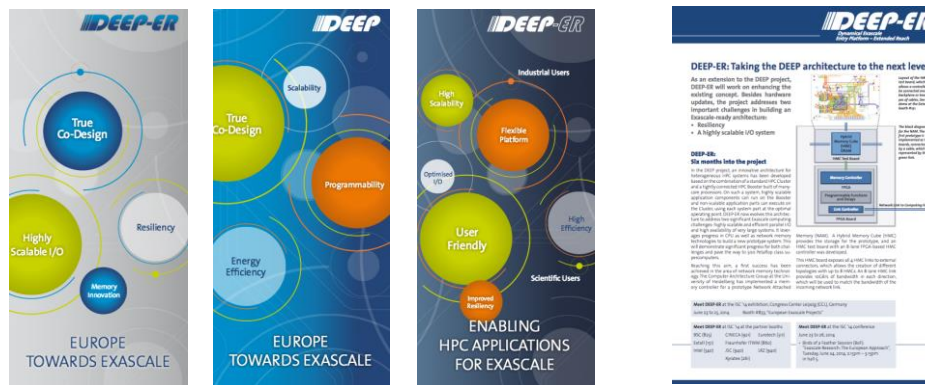


Figure 3: Flyer new (left) vs. flyer old (right)

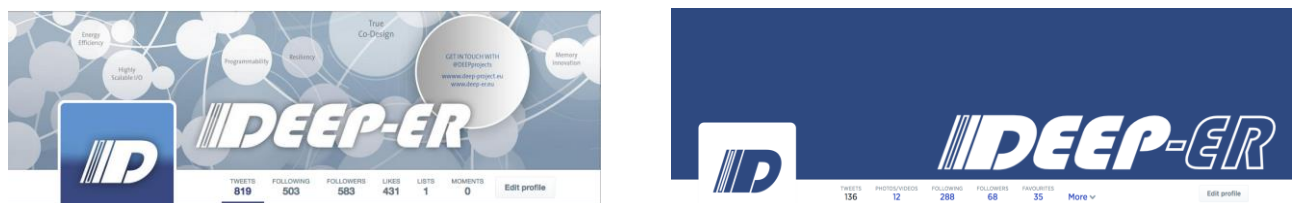


Figure 4: Twitter profile new (left) vs. Twitter profile old (right)

Apart from the more visual changes, communicating the key messages influenced all our content creation. For this, we tried to balance the joint branding and talking about common basic concepts of DEEP and DEEP-ER with communication on DEEP-ER specific key messages.

- **DEEP-ER USP (Unique Sell Point):** ‘True’ Co-Design that reaches from hardware to middleware/system ware to tools to applications
 - **Key message deriving from the USP:** Only via ‘true’ Co-Design it is possible to achieve Exascale performance on an application level.

Comment: Co-Design – as we understand it in the DEEP and DEEP-ER projects – is still something that sets the project apart from other (European) projects in the Exascale research area. Furthermore, co-design is applied even more rigorously in DEEP-ER. With a special section on this topic on the website and two pages dedicated to it in the final brochure, it has been addressed more prominently in the reporting period since the last review.

- **DEEP-ER USP: Cluster-Booster-Concept**
 - **Key message deriving from the USP:** The Cluster-Booster concept is the only feasible approach of mapping the inherent heterogeneity of applications on to the hardware system.

Comment: The Cluster-Booster Architecture remains a unique approach to heterogeneous computing and forms the basis DEEP-ER builds on. Experience has shown, that it is useful to keep repeating this. Currently we are already extending this and blending in the concept of Modular Supercomputing that will be a key message for DEEP-EST.

- **DEEP-ER USP: highly scalable, efficient, and user-friendly I/O system**
 - **Key message deriving from the USP:** Memory is a key challenge to be addressed at Exascale. Only with the help of a highly scalable, user-friendly I/O system it will be possible to fully exploit complex memory hierarchies.

- **DEEP-ER USP:** dual-approach resiliency concept
 - **Key message deriving from the USP:** Keeping Exascale (-ready) machines programmable and manageable is key for developing a functioning machine. The DEEP-ER resiliency concept marks a leap forward in this respect.

Naturally, the key messages vary in terms of complexity depending on the audience: Whereas for a HPC 'literate' audience we extended these key messages with more complex explanatory information, the key messages were simplified when talking to the general public at e.g. open door days at the partner institutions.

Additionally, as mentioned in previous deliverables, the different key messages varied in their importance depending on the time-frame of the project. The DEEP-ER specific ones on I/O and resiliency became ever more important when we started developing more content directed at potential users (e.g. the application pages on the website).

After the official project end, it will be important to continue talking about our key messages and combine these with results to substantiate them even more.

2.2 Website

For details on the facelift and first steps in SEO, please see D2.2. In this deliverable, we would like to focus on additional measures taken since the last deliverable, as well as report on the overall impact created with the project website.

A very important measure was to fix some bugs in the backend that hindered the site to be searchable in Google. On top of that, we focused on creating new content and adapting the website to better reflect the key messages. Since October 2015, the most important updates were:

- Introducing '**co-design**' in the navigation bar: (<http://www.deep-er.eu/co-design.html>). With this dedicated space on the website, we highlight the importance of this aspect to the project overall and it allows us to present our success stories in this area.
- Extending the '**application**' pages: As mentioned above, the idea here was to create content that is meaningful and interesting to potential users of the DEEP-ER Prototype. Hence, we included information on the advantages of the architecture for application developers, or how to modernise application code for systems like these. We have also collected first-use cases and will extend this in the months to come with showing the results achieved by the DEEP-ER co-design applications.
- Improving the information on **software**: For both, I/O and resiliency, interested readers find a lot of information on the system software developed in DEEP-ER. For many of the software, benchmarking and tools used in DEEP-ER, packages and documentation are available online as Open Source. We have collected all of this information and made it accessible to an interested audience putting it all on a single point on the website: <http://www.deep-er.eu/software/sources.html>.
- Making accessible **presentations and publications**: We were particularly eager to share presentation slides, posters and publications coming from the DEEP-ER project with an interested scientific audience and have tried to keep this page up-to-date in a timely manner: <http://www.deep-er.eu/project/publications.html>.
- Guaranteeing a regular stream of **news**: In the second half of the project – after the facelift – we have published almost twice as many news pieces as during the first half of the project (see: <http://www.deep-er.eu/press-corner/news.html>). It was our

intention to stream news on a more regular basis – even if this meant, some news were shorter.

- Using fresh content and visuals for the **start page**: Updates in the news section went along with (more) frequently updating the focus topics on the start page as well as the slide-show on the start page to make the website interesting for recurring visitors. For the latter, we have continuously created new visuals in line with the new, modern 'corporate design' (see figure 5).



Figure 5: Selection of topical start page sliders

Web Statistics

With respect to the statistics for the DEEP-ER website, we continuously evaluate:

- Unique visitors (A unique visitor is a person or computer (host) that has made at least 1 hit on 1 page)
- Number of visits (Number of visits made by all visitors / sessions)
- Pages (Number of "pages" viewed by visitors)
- Hits (Any files requested from the server)

Most relevant to present here are the statistics on unique visitors and the number of visits we have achieved over time. These numbers clearly prove that the facelift in combination with putting resources on creating new content was worthwhile.

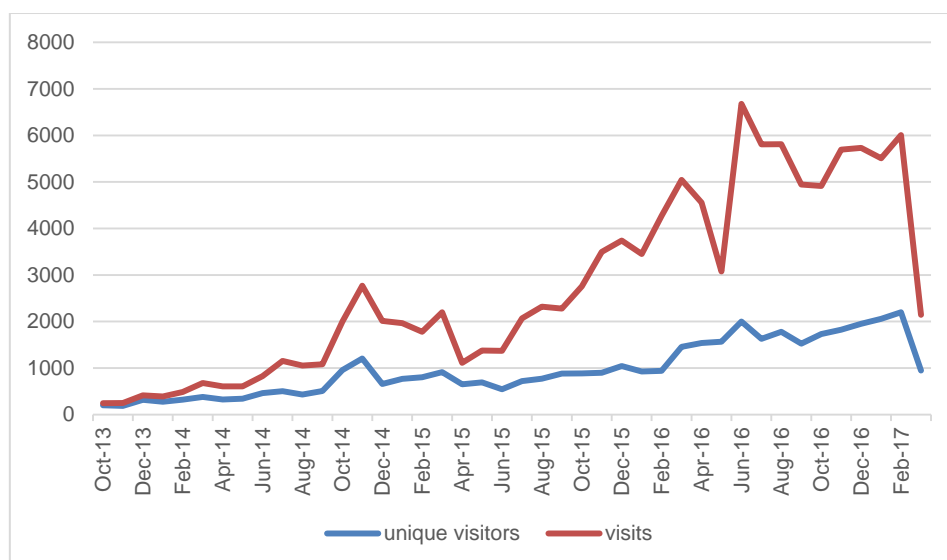


Figure 6: DEEP-ER website stats: Oct 2013 - March 2017

It is important to remember, that we launched the new website in summer 2015. Even though there are the usual peaks, that we typically see when there are events, the statistics shown in figure 6 prove that there has been a tremendous increase in the number of unique visitors as well as visits.

When having a look at the combined numbers per year, it becomes even clearer (figure 7): whereas in 2014 there were a little more than 13.000 visits, in 2015 it doubled already to around 26.500. In 2016, this number even almost tripled to peak at close to 60.000 visits. The years 2014-2016 have been chosen because they are full calendar years and numbers can be compared over 12 months.

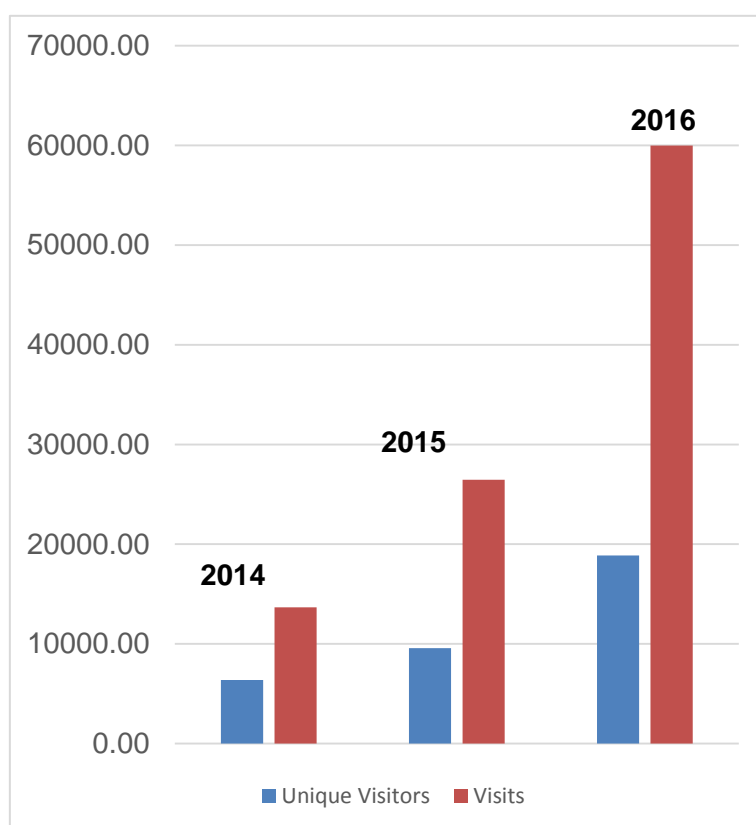


Figure 7: DEEP-ER website stats: yearly comparison

2.3 Social Media

Before diving into the details, as a quick reminder: we currently maintain social media handles on Twitter and LinkedIn. Both had been initiated as joint handles for the DEEP and DEEP-ER projects. The intention is to keep it that way – meaning we have only one channel on each social media platform for all DEEP projects – when DEEP-EST starts. This allows us to build on the follower base and community we are already engaging with and ensures we are not cannibalizing our efforts here with different handles per platform.

2.3.1 Twitter

Generally speaking, Twitter has been, and will continue to be, a key channel for increasing the impact of our dissemination activities in the DEEP projects.

We monitor the following Key Performance Indicators (KPI) for our Twitter handle:

- Absolute numbers of followers
- Mentions and re-tweets
- Impressions & Interactions

In terms of absolute numbers, the channel has seen steady growth since we launched it in May 2014 (see figure 8). Absolute numbers could be higher – as of March 27, 2017, we have 592 followers. However, we would like to point out again, that the total number is not the most significant one for us.

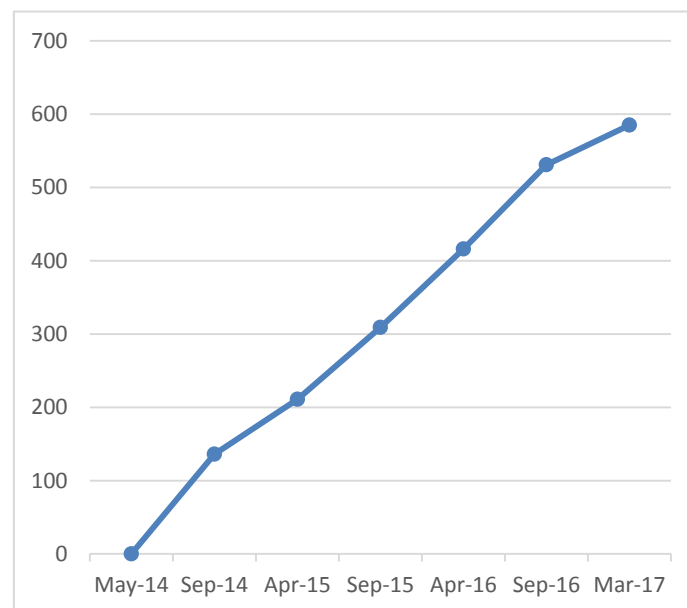


Figure 8: Follower numbers @DEEPprojects

When having a look at the impressions – the number of people who see a Tweet – it becomes clear, we reach a large audience, a lot more than the actual number of followers would suggest (see figure 9). In some months, close to 30.000 people see our Tweets. Since October 2015 (last deliverable), our Tweets have reached in total close to 225.000 people.

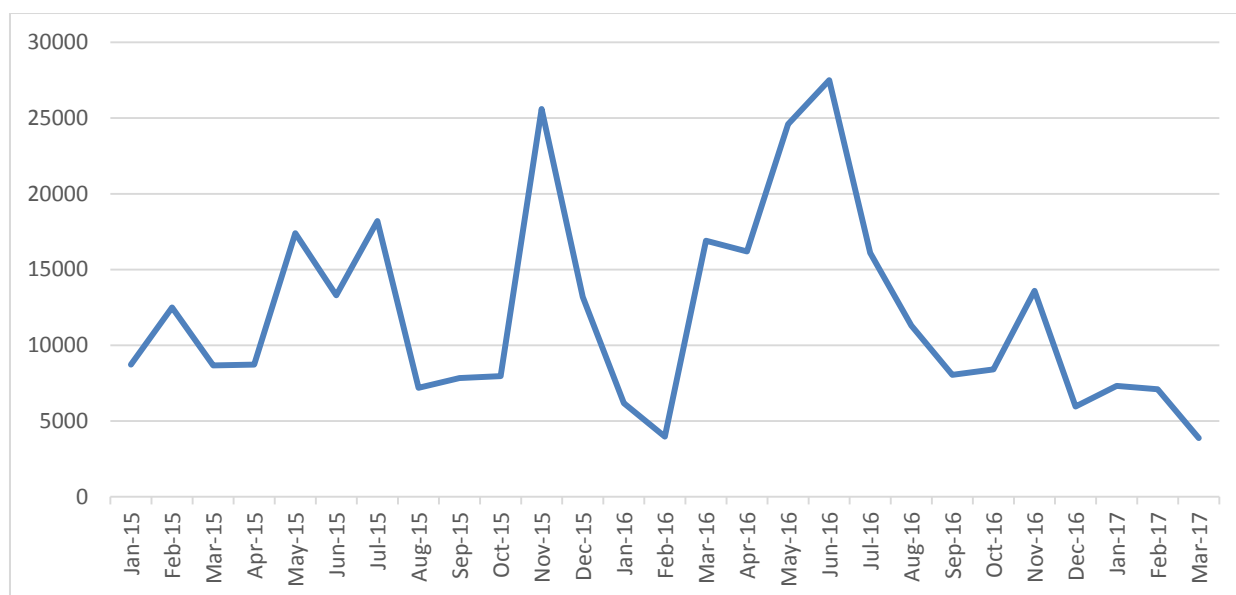


Figure 9: Impressions @DEEPprojects Tweets over time

As you can see, there are peaks – similar to those from the website statistics. These usually correlate with months in which we are active at conferences, trade fairs or exhibitions.

When looking at popular Tweets, content valued a lot by our audience is important information on the project – be it on hardware, or software, application results or papers (see figure 10). Also, information related to the European Exascale community or big events are of interest. This is a great indicator that the content on our website forms valuable information for Twitter and that on the other hand, Twitter drives interested readers to our website.

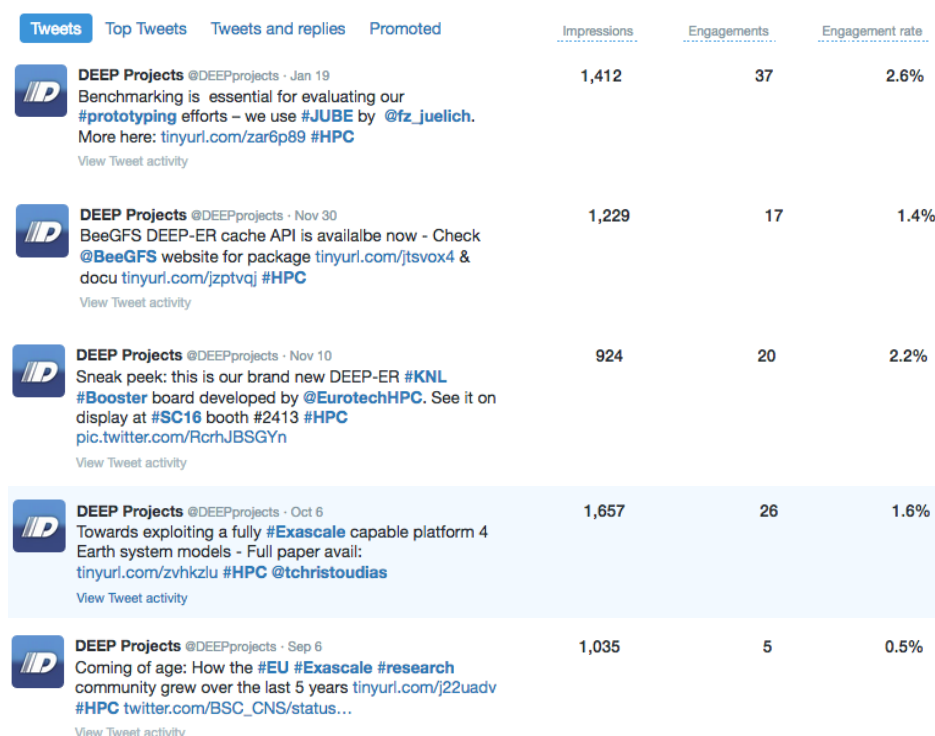


Figure 10: Selected popular Tweets from @DEEPprojects

You can find our Twitter channel at this link: <https://twitter.com/DEEPprojects>.

Finally, we would like to point out that some project colleagues are also quite active via either their private Twitter profiles, or via profiles of their organisations. To just name a few, interaction on Twitter with @IntelHPC usually has a massive impact. Also, DEEP-ER partner Fraunhofer-ITWM is very active with their @BeeGFS account and Eurotech with their @EurotechHPC channel. Last, but not least, some of the application developer colleagues are active with their private accounts.

2.3.2 *LinkedIn*

When starting out with our LinkedIn group, we kept track of the following KPIs:

- Absolute number of group members
- Interactions
 - Discussions resulting from posts
 - Variety of people posting to the group

LinkedIn has never had the impact Twitter had and still has for us. We have taken measures to improve our outreach via LinkedIn like posting more frequently, have the researchers in the project post themselves (not the dissemination team), promote the LinkedIn group prominently via a (permanent) start page slider on the website.

However, over the timeframe of the whole project, it became ever more difficult to use this channel effectively – mainly for two reasons: First, LinkedIn changed its regulations for groups. Whereas in the beginning, content posted to groups was visible for anybody, meaning also non-group members, this has changed with LinkedIn's new rules. Now only group members can read and post to the group. Second, social media statistics suggest changed usage behaviours. People tend to have LinkedIn profiles for self-marketing and networking in a professional world but, generally speaking, lines between work life and private life on social media channels seem blurred. Users tend to favour Facebook for content – even if it is work related.

In light of these developments, we have to review our social media strategy and critically question which channels to focus on. We have addressed this topic also in plenum at a Face2Face meeting. But as we could not be sure, whether our DEEP projects journey would continue or not, it did not make too much sense to open up new channels on other platforms at a rather late point of time in the project. Hence, we decided to keep the LinkedIn channel at least till the end of DEEP-ER and keep it up to date. However, with DEEP-EST on the horizon, we might discontinue the LinkedIn group and put focus and resources on another channel – most likely Facebook.

Still, overall, our social media activities have been an important pillar in our outreach activities in general – especially when looking at the @DEEPprojects Twitter handle. We believe our social media activities to be key also for future outreach activities.

2.4 Events and Conferences

As mentioned in 2.1, events, conferences and trade fairs tremendously enriched our strategy of owned, earned, and paid media and offered the possibility to get in touch with an interested audience in a more direct, personal manner. Furthermore, due to an integrated communication approach, a great deal of our media coverage resulted from activities at these events.

The numbers prove that this approach paid off and that this was possible due to the activity of colleagues from the whole consortium:

- 10 participations at exhibitions and trade fairs with (mainly) shared booths (SC, ISC, CeBIT, Teratec, SAI Computing Conference)
- more than 60 presentations given at (mainly scientific) conferences, roundtables etc.
- 9 media briefings at events
- More than 30 pieces of coverage related to activities around events

In the reporting period since the last deliverable (October 2015 – March 2017), the following events and conferences were attended:

- SC15, Nov 15 to 20, 2015, Austin, USA: Booth and technical conference program
- CeBIT, March 14 to 18, 2016, Hannover, Germany: Booth
- EASC16, April 25 – 29, 2016, Stockholm: Satellite event by EEP
- EXDCI workshop during the European HPC Summit Week, May 12, 2016, Prague: Talk
- ISC'16, June 19 to 23, 2016, Frankfurt, Germany: Booth and technical conference program
- Teratec, June 27 to 28, 2016, Ecole Polytechnique, Palaiseau Cedex, France: booth DEEP-ER partner
- SAI Computing Conference, July 13 to 15, 2016, London, UK: Booth and keynote
- SC16, Nov 13 to 18, 2016, Salt Lake City, USA: Booth and technical conference program

Especially for ISC and SC it needs to be highlighted that activities were global: we had a strong presence on the show floor at booths – be it with other European Exascale Projets, or with other partners. Yet, we had also a strong presence in the technical program thanks to the contribution of DEEP-ER colleagues in the form of papers, BoFs, workshops and doctoral showcases. It should not be forgotten that cooperation with DEEP-ER consortium partners for various events was extremely useful as well.

Last but not least, it merits special mention that DEEP-ER colleagues were asked to give keynotes at the following scientific conferences:

- EMiT Emerging Technology Conference, June 2 – 3, 2016, in Barcelona, Spain: Keynote by Dr. Estela Suarez on 'Technology Emerging from the DEEP and DEEP-ER projects'.
- SAI Computing Conference, July 13 – 15, 2016, London, UK: Keynote by Prof. Dr. Norber Eicker on 'Taming Heterogeneity in HPC - The DEEP and DEEP-ER take on Heterogeneous Cluster Architectures'
- ISUM 2017, Feb 27 – March 3, 2017, Guadalajara, Mexico: Keynote by Dr. Estela Suarez on 'Modular Supercomputing: the DEEP approach to hardware heterogeneity'

Overall, it is clear that presentations at conferences and events are extremely helpful in promoting the DEEP-ER project and creating visibility in the scientific community – both in IT

and in domain sciences.

2.5 Materials

2.5.1 Marketing collateral: Roll-up, Stickers + Buttons

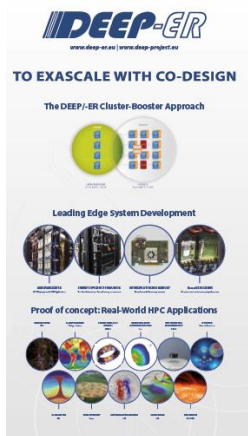


Figure 12: DEEP & DEEP-ER roll-up

To not only convey the key messages, but also increase the recognition value of the brand we had stickers and buttons produced – both look identical (figure 11).



Figure 11: DEEP projects sticker & buttons

Additionally, a roll-up was created reflecting the joint DEEP and DEEP-ER branding and messages and was presented e.g. at the SAI conference in July 2016 (figure 12).

As a reminder: Since we opted for more general project flyers that give a short overview on the project and lead to the website for detailed information as well as project updates, there have not been major changes to the project flyers. Current, but still accurate versions can be found here: <http://www.deep-er.eu/press-corner/materials.html>

2.5.2 Promotional Items

For our outreach activities at the usual SC and ISC exhibits, we had promotional items produced. Here we shifted our focus on spending the budget on more high-quality give-aways and hand these out only to very interested booth audience (compared to cheaper give-aways to attract people). See figure 13 for a selection of those items:



T-Shirt



USB 3.1; 16GB

Figure 11: Recent DEEP-ER give-aways

2.5.3 Final Brochure

As the final brochure for the DEEP project had gotten good feedback and was well received especially at events and conferences, we opted for a final brochure for DEEP-ER as well – as the main, but not the only final dissemination activity. In a concise approach, the brochure presents the major developments and results achieved in DEEP-ER in a single booklet. In contrast to the DEEP brochure, we have been aiming at a closer integration of the print brochure and the website content. Additionally, the print version of the brochure will be adapted better for online reading than



Figure 12: DEEP-ER final brochure (cover)

the DEEP one was. Both will be available before the final review in May 2017. You can already see the cover in figure 14.

2.5.4 Audio-visual material

Since the production of audio-visual material is both quite cost- and labour-intensive, our strategy was to leverage synergies and either have material created in the framework of conferences, where usually organisers tend to produce video content. Alternatively, we linked this to media relations and videos were produced by the media outlets – typically also popular at conferences. This approach also allowed us to easily convey our key messages – as you would otherwise do in written material for media for instance.

This resulted in a total of 10 videos on the DEEP-ER project – not including the DEEP and DEEP-ER image video we had produced in the first half of the DEEP-ER project. Figure 15 gives a complete overview.

Title	Channel	Link
Collective I/O for Exascale I/O Intensive Applications	YouTube	https://www.youtube.com/watch?v=uSo0K82E3e0
Six European Exascale Projects are Dealing with the Hardware and Software Challenges in Exascale	Primeur Magazine	http://primeurmagazine.com/weekly/AE-PR-08-14-37.html
Applications for the DEEP and DEEP-ER Project	InsideHPC / Rich Report	https://www.youtube.com/watch?v=oKwKuulwrwA
DEEP and DEEP-ER Project Updates	InsideHPC / Rich Report	https://www.youtube.com/watch?v=fIO-KOn3qKE
DEEP/-ER Image Video	YouTube + DEEP-ER Website	https://www.youtube.com/watch?v=eWaFRYYJxK0
European Exascale Projects at ISC'15: Day 1	YouTube	https://www.youtube.com/watch?v=ZP4uUzG7GJc&feature=youtu.be
Video production on promoting DEEP/ER prototype system	Twenty4Picutres	to be published
Taming Heterogeneity in HPC - Video of Keynote	YouTube + DEEP-ER Website	https://www.youtube.com/watch?v=aM9AkgG5ud4&feature=youtu.be
Interview E. Suarez on her EMiT 2016 keynote	YouTube + DEEP-ER Website	https://www.youtube.com/watch?v=5KL0RMW4A4
DEEP-ER Modular Supercomputing - Recording of a talk given at SC16 at the Intel Community Hub	Intel + DEEP-ER Website	http://www.intel.com/content/www/us/en/high-performance-computing/julich-deeper-projects-video.html

Figure 13: Overview audio-visual content DEEP-ER

2.6 Media Relations

Media relations are a key cornerstone of our communication strategy: Media reporting on DEEP-ER has a great impact and helps us in getting across our key messages. A focus on reaching out to HPC publications as these helped us reach the supercomputing community –

including an industrial audience. Apart from that, media relations offered us the possibility to reach out to a more general public – see figure 16 for key outlets.



Figure 14: Selected key HPC & trade media

Besides the 1:1 briefings and (background) interviews, we created numerous pieces of written content, which were picked-up by the media.

Press Releases:

- Fraunhofer ITWM: [BeeGFS Parallel File System now OpenSource](#) (Feb 2016)
- Eurotech: [Eurotech introduces the Aurora Tigon v4](#) (June 2016)
- Extoll: [Extoll network chip enables network-attached accelerators of any kind](#) (June 2016)

More press releases are planned: One on the official end of the project (to be issued after the final review) and one on the MoU with PRACE (details to be discussed).

News pieces on website:

On top of the official press releases distributed to our key contacts, we laid a focus on pushing out shorter news pieces via the website's news section and kept that up to date more regularly: <http://www.deep-er.eu/press-corner/news.html>

In total, we achieved 50 pieces of coverage throughout the whole project (see Appendix for a detailed list).

2.7 Publications, Proceedings & Posters

For reaching out to scientific audiences, peer-reviewed publications and papers in conference proceedings are highly important. In the last phase of the project, colleagues have been active in publishing their results. To date, 8 papers were or are about to be published – half of them as open access. It merits special mention that colleagues from all three parts of the project (hardware, software, applications) were active here – also with presenting posters at scientific conferences.

A full list of DEEP-ER related peer-reviewed publications and presentations can be found in the annex to this document.

2.8 Cooperation European Exascale Projects

Throughout the whole project, cooperation with other European funded projects in the field of HPC was important to realise our dissemination activities. In the first half of the project, collaboration was extensive with what had been labelled 'European Exascale Projects' (short EEP). Due to the fact that FP7 projects ended at different points of time, in the second half of the project co-operation was more bi-lateral, meaning cooperation with EXDCI as representative of the H2020 projects or cooperation with other projects on a 1:1 basis (e.g. Mont-Blanc, NEXTGenIO).

Concerning the European Exascale projects, which organised outreach of the FP7 FET-HPC projects, collaboration was sought for all kinds of activities: Sharing booths as well as organising BoFs, or workshops at the usual SC and ISC exhibitions were complemented with planning joint trainings or satellite events at e.g. the PRACEdays or the EASC conference. It deserves special mention that the DEEP/-ER projects were taking a lead role in organising the joint teleconferences and actively co-ordinating and implementing the joint efforts.

With respect to the reporting period (October 2015 to March 2017), we would like to highlight the final brochure we put together on the activities of the European Exascale Projects (see figure 17), meaning the FP7 FET-HPC projects. The booklet was published for ISC'16 in Frankfurt and got quite some attention there. The PDF online version was also taken up and re-published by insideHPC and promoted by the EC. It can be found here: http://exascale-projects.eu/EuroExaFinalBrochure_v1.0.pdf.

The overview on numbers of what we were able to achieve in a joint effort should speak for itself (see also figure 18). We are convinced that we can speak for all projects when stating that these joint efforts were extremely fruitful in establishing and growing a European Exascale community and increasing the impact of our public outreach. We will for sure continue with this kind of cooperation in one way or another when starting the DEEP-EST



Figure 15: Final Brochure on EEP activities

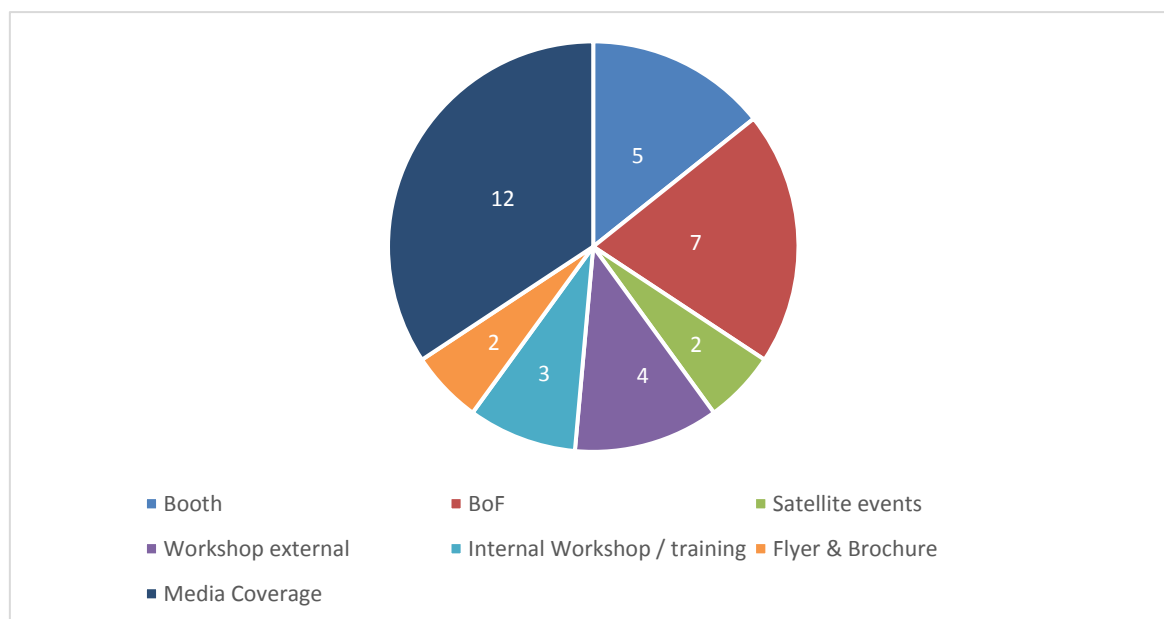


Figure 16: Overview collaboration activities EEP and other European projects

project.

2.9 Budget

Given the fact that WP2 had a considerable budget at its disposal, a short re-cap on spending is given here.

The overall budget allocated for dissemination activities in DEEP-ER was €73.277 – of which around €68.000 has been used-up. This budget has been spent wisely with respect to the selection of dissemination activities carried out and material needed to support these actions, as well as their overall cost–benefit ratio.

Generally, the most cost-intensive activities were participating in the ISC and SC exhibitions. However, we are convinced that these efforts were necessary for increasing the project's visibility in the HPC community and for intensive interaction with stakeholders. Hence, the budget allocated was worth investing. Still, in order to keep those costs at an acceptable level, synergies were leveraged by cooperating with the other European Exascale Projects e.g. in sharing booth costs. The budget left-over can to a large extent be explained with the fact that no cooperation was possible for SC16 in a way beneficial for DEEP-ER. Therefore, we joined the JSC booth at SC16 at almost no additional cost for the project.

Apart from event-related activities, we spent a considerable amount of the budget on the website facelift, the re-branding (or joint branding) materials as well as for the final brochure. Here we spent extra money on an online version of the brochure to ensure better usability than a pure PDF offers for online read.

Generally speaking, it was made sure that all subcontracting necessary (e.g. website facelift, graphics design, booth building and the like) was done according to the procurement directives effective in FP7 as well as BADW-LRZ internal procurement guidelines.

3 Task 2.2: Industry and business cooperation

With respect to task 2.2 business and industry cooperation, it became apparent over the timeframe of the whole project that we had to be clearer on our strategy and that we had to refine it. It has to be stated, that the project cannot market the results for or on behalf of the consortium partners – this holds true especially for the industry partners like Eurotech and Extoll – WP2 can only support these efforts. Furthermore, we have to consider more indirect forms of business and industry involvement. This means, we as a project can e.g. raise awareness among potential users, who can in turn express their desire for architectures like that of DEEP-ER and we can exercise influence via standardisation bodies. In light of these aspects, we focused on the following five pillars:

- Increasing impact via industrial lobbying organisations (e.g. ETP4HPC or PROSPECT);
- Focus on communicating DEEP-ER software developments;
- Support partner marketing activities;
- Presence at industry-oriented conferences and events;
- Cooperation with PRACE to extend the user base.

Considering the first aspect, especially the collaboration with ETP4HPC has been very fruitful. All DEEP-ER developments are aligned with the Strategic Research Agenda (SRA)

as proposed by ETP4HPC. Due to the fact that quite a number of DEEP-ER partners are members or even founders of ETP4HPC and partly also lead working groups within ETP4HPC, the influence has been mutual and on all areas relevant to the project – starting from system architecture to hardware development to programming models to I/O (see also D1.9 for a more detailed description). On top of that, DEEP-ER partners have also been very active in standardisation bodies, especially in the field of system software.

Regarding the software developments, these have also been promoted via WP2 (see figure 20) and we updated the sections on the website accordingly. Apart from the updated descriptions on developments within the projects, we did an overview on all the software, where it is available (most of it is open access) as well as links to documentation to offer added value to our audience: <http://www.deep-er.eu/software/sources.html>.

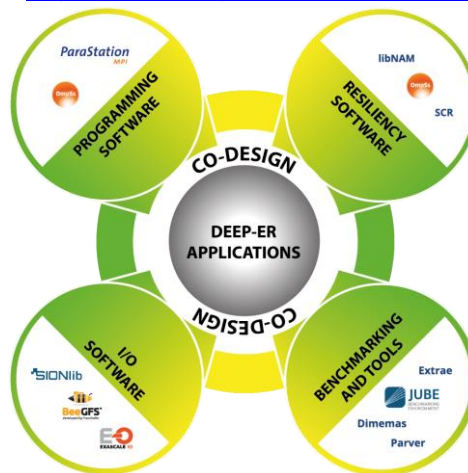


Figure 17: Overview DEEP-ER software environment

The marketing efforts by the DEEP-ER partners have also contributed considerably to outreach activities in this field. DEEP-ER developments present a great showcase for many of the partners and they took the opportunity to use them to promote these themselves. Just to name a few examples: Eurotech, Extoll and Fraunhofer ITWM (in collaboration with their spin-off ThinkParque) issued press releases and did media briefings on technology coming out of the project. Industrial partners, like Seagate, took over dissemination activities at exhibits like e.g. the Teratec Forum in 2016. Finally, Intel did collaborate with DEEP-ER for e.g. ISC and SC conferences, the Teratec Forum and produced content like videos or by-lined articles in media. The most recent example is content that stems from a talk by Norbert Eicker at the Intel Community Hub at SC16 which resulted in a video (<http://www.intel.com/content/www/us/en/high-performance-computing/julich-deeper-projects-video.html>) and a piece on HPCwire (<https://www.hpcwire.com/2017/02/24/modular-supercomputing-deep-deep-er-architectures/>).

Especially in the reporting period since the last deliverable, DEEP-ER seized the opportunity to be present at more industry-oriented events. The highlight here was definitely being present at a shared booth at CeBIT16. This also offered the possibility to meet with trade media with a strong industry focus – in this case Data Center Insider who published a lengthy by-lined article written by DEEP-ER in the aftermath of the trade fair.

Finally, a MoU is about to be signed with PRACE-4IP on making the prototype available to PRACE users. This collaboration shall provide further validation results, increase the impact of the DEEP-ER project, and facilitate the adoption of its developments by the European HPC user community.

4 Task 2.3: Training & Education

The intended approach for this task was twofold:

- To implement a systematic education and training program in order to enable DEEP-ER application developers in using DEEP-ER technologies.
- To educate interested external publics.

Regarding the internal trainings, the focus was on (a) Xeon Phi optimisation, (b) the DEEP-ER resiliency strategies and (c) the DEEP-ER I/O stack. Generally speaking, these internal training workshops were organised depending on the application developers' needs. Where deemed necessary, these events were arranged in cooperation with other European Exascale projects – mainly with Mont-Blanc for overlapping topics.

Concerning workshops directed at an external audience, usually cooperation was sought with the EEP or with H2020 projects on a bi-lateral basis.

In the reporting period since the last deliverable (October 2015), colleagues organised and/or participated in the following trainings and workshops:

- Internal training events:
 - Resiliency and Fault Tolerance for HPC, April 21 - 22, 2016, Barcelona, Spain. Organised by WP 4, 5, 6 and in cooperation with the Mont-Blanc project
 - Hands-on co-design session, October 24, 2016, Jülich, Germany. Organised by WP 6
- External training events:
 - KNL Training, September 02, 2016, Jülich, Germany. Hosted by JSC in cooperation with Intel developers, open to WP6 colleagues
- Workshops for external audiences:
 - Enabling Scientific Applications for Exascale in Europe, April 29, 2016, Stockholm, Sweden. Organised in cooperation with EEP as a satellite event in the framework of the EASC (Exascale Applications and Software Conference).
 - Developing Next-gen HPC Architectures – A Hardware Prototyping Workshop, June 23, 2016, Frankfurt, Germany. Organised by DEEP-ER and Mont-Blanc in the framework of the ISC'16 workshop day (<http://www.deep-er.eu/press-corner/events/past-events/25-isc16-prototyping-workshop.html>)
 - Exascale I/O Challenges, Innovations, Solutions. November 18, 2016, Salt Lake City, USA. Organised by NEXTGenIO Project, with DEEP-ER support in the framework of SC16 workshops (<http://www.nextgenio.eu/sc16-workshop-exascale-io>)

Apart from Face2Face trainings and workshops, we have been and continue to provide relevant information via the website. Trainings, and where possible training materials, are listed and available via the project website. Also, the best practice guide currently developed in WP6 will be made available via the website. Finally, in the MoU with PRACE-4IP it has been agreed that interested PRACE users will have access to documentation and that individual user support will be provided on a good-will and best effort basis.

5 Conclusion & Outlook

Overall, it can be stated that the activities realised in WP2 let us achieve all three objectives of the work package, namely (a) disseminating the achievements of DEEP-ER to major HPC stakeholders and to the European scientific community; (b) the liaison with European industry and research organisations; as well as (c) the implementation of a targeted education and training program.

WP2 has succeeded in creating awareness and visibility for the project. Key to this success was the refined outreach strategy and the huge emphasis on our owned channels – the DEEP-ER website and the DEEP projects social media channels. Additionally, the impact that the participation at events and conferences had, cannot be underestimated. This applies as well to the outreach via scientific papers and presentations held at scientific conferences. Even though, there is still room for improvement and there are still topics to be covered more intensively e.g. via the website, and we have to re-consider LinkedIn as an impactful social media channel, the task 2.1 has been executed successfully.

Regarding business and industry relations, we have to admit that the initial plan could not be realised as intended due to constraints mentioned in section 3. However, with a refined approach and the concerted effort by DEEP-ER partners and WP2, we could still achieve considerable impact. For DEEP-EST the experience gained in this task has been used to re-work the plan.

As far as education and training is concerned, the need for training internally was fulfilled – even more hands-on and co-design sessions were organised than in DEEP. But also with respect to educate external audiences, the consortium did excellent work. Here the synergies leveraged due to close collaboration with other European projects were of great help. Education and training is to be continued in the realm of the PRACE-4IP cooperation.

With respect to future activities, communication efforts will continue to be seamless, both in the short and in the midterm. In the short run, concrete DEEP-ER activities are under way like the final brochure, a final press release (to be issued after the review), potentially joint communication on the MoU with PRACE-4IP and last but not least, dissemination of the results at ISC'16 in a joint effort by JSC and LRZ. Mid-term, it shall be highlighted again that the DEEP-ER communication channels are kept and adapted to reflect the whole DEEP projects family. This means that all content now available via the DEEP-ER website will be available in future – this holds true as well for social media.

To summarise, the DEEP projects family has established itself as a key player in the European Exascale community – the DEEP-ER dissemination and outreach activities contributed tremendously to achieve this. We are eager to continue this journey.

Annex A

Peer-Reviewed Publications

Title	Main Author	Name of Publication	Year	DOI	Open Access
Collective Offload for Heterogeneous Clusters	Sainz, F.	Proc. Of 22nd IEEE International Conference on High Performance Computing	2015	DOI: 10.1109/HiPC.2015.20	(n)
Adapting a Finite-Element Type Solver for Bioelectromagnetics to the DEEP-ER Platform	Leger, R.	Proc of ParCo 2015	2016	DOI: 10.3233/978-1-61499-621-7-349	(y)
Progress towards Physics-Based Space Weather Forecasting with Exascale Computing	Innocenti, M. E.	Advances in Engineering Software	2016	http://dx.doi.org/10.1016/j.advengsoft.2016.06.011	(n)
Improving Collective I/O Performance Using Non-Volatile Memory Devices	Congiu, G.	Proc of IEEE Cluster 2016	2016	DOI: 10.1109/CLUSTER.2016.37	(n)
Exploring Time and Energy for Complex Accesses to a Hybrid Memory Cube	Schmidt, J.	Proc of Memsys 2016	2016	http://dl.acm.org/citation.cfm?id=2989099	(y)
Image-Domain Gridding on Graphics Processors	Veenboer, B.	Proc of IEEE International Parallel and Distributed Processing Symposium (IPDPS'17)	2017	not yet published	(n)
Exactly energy conserving semi-implicit particle in cell formulation	Lapenta, G.	Journal of Computational Physics	2017	http://dx.doi.org/10.1016/j.jcp.2017.01.002	(n)
Supporting Automatic Recovery in Offloaded Distributed Programming Models Through MPI-3 Techniques	Pena, A.	Proc. Of ISC'17	2017	tbd	tbd

Presentations

Presenter	Title	Event	Date	Place	Audience	Coverage
N. Eicker (JUELICH)	DEEP and DEEP-ER: Boosters for HPC	Human Brain Project Summit (HBP) 2013	09/10/2013	Lausanne, Switzerland	HPC Community Scientific Community	Europe
N. Eicker (JUELICH)	The DEEP-ER Project - Extending the Reach of the Cluster-Booster Architecture	European Research and Innovation Conference (ERIC 2013)	23/10/2013	Nice, France	HPC Community Scientific Community	Europe
H.-CH. Hoppe (INTEL)	DEEP and DEEP-ER Architecture (demonstration at the Intel booth)	SC13	18/11/2013	Denver, Colorado	Scientific Community HPC Community Industry Media	International
N. Eicker (JUELICH)	DEEP and DEEP-ER: Innovative Cluster Architecture for Intel Xeon Phi (held at the BoF)	SC13	19/11/2013	Denver, Colorado	Scientific Community HPC Community Industry Policy Maker Media	International
N. Eicker (JUELICH)	DEEP and DEEP-ER: Innovative Cluster Architecture for Intel Xeon Phi (held at Intel Theatre / Intel Booth)	SC13	19/11/2013	Denver, Colorado	Scientific Community HPC Community Industry Policy Maker Media	International
E. Suarez (JUELICH)	Emerging Technologies and Big Data (Euro-Centric): Participation in Panel Discussion	SC13	21/11/2013	Denver, Colorado	Scientific Community HPC Community Industry Policy Maker	International
E. Suarez (JUELICH)	DEEP and DEEP-ER	Joint European Exascale Projects Workshop	18/03/2014	Edinburgh, Scotland	Project Internal	Europe
N. Eicker (JUELICH)	Global MPI and the DEEP Programming Model	Joint European Exascale Projects Workshop	18/03/2014	Edinburgh, Scotland	Project Internal	Europe
J. Labarta (BSC)	OmpSs	Joint European Exascale Projects Workshop	18/03/2014	Edinburgh, Scotland	Project Internal	Europe
B. Mohr (JUELICH)	Scalasca	Joint European Exascale Projects Workshop	18/03/2014	Edinburgh, Scotland	Project Internal	Europe
S. Narasimhamurthy (Seagate)	Collective I/O for Exascale I/O Intensive Applications	LUG 2014	09/04/2014	Miami, US	Scientific Community HPC Community Industry	International
H.-CH. Hoppe (INTEL)	Demonstration at the Intel booth, showing DEEP and DEEP-ER Results	ISC'14	23/06/2014	Leipzig, Germany	HPC Community Industry Scientific Community	International
N. Eicker (JUELICH)	The DEEP and DEEP-ER Projects - presentation held at European Exascale Projects BoF	ISC'14	24/06/2014	Leipzig, Germany	Scientific Community HPC Community Industry Policy Maker Media	International

R. Leger (INRIA)	A parallel Discontinuous Galerkin Time-Domain solver of Maxwell's equations	4th Brazil –France Workshop on High Performance Computing and Scientific Data Management	15/09/2014	Gramado, Brasil	HPC Community Industry Scientific Community	International
E. Suarez (JUELICH)	DEEP and DEEP-ER	JUELICH-JSC meeting (Visit C.Aubley)	19/01/2015	Jülich, Germany	HPC Community	Germany
E. Suarez (JUELICH)	DEEP and DEEP-ER: Status Update	ECL Meeting Jülich	13/05/2015	Jülich, Germany	HPC Community	Germany
B. Mohr (JUELICH)	Jülich On The Way To Exascale	2nd International HPC Forum	20/05/2015	Tianjin, China	HPC Community	International
N. Eicker (JUELICH)	DEEP and DEEP-ER	JSC-LBL meeting (Visit S.Dosanjh)	22/05/2015	Jülich, Germany	HPC Community	Europe
E. Suarez (JUELICH); M. Tchiboudkjian (CGG); G. Staffelbach (CERFACS)	DEEP and DEEP-ER: Innovative Exascale architectures in the light of user requirements	PRACEdays15	26/05/2015	Dublin, Ireland	HPC Community Industry Scientific Community	Europe
E. Suarez (JUELICH)	The DEEP-ER way towards exascale I/O and resilience	NorduGrid Conference	04/06/2015	Bern, Switzerland	HPC Community Scientific Community	Europe
G. Lapenta (KU Leuven)	Using HPC Kinetic Simulations to Help the MMS Mission Find its Target: Reconnection Diffusion Regions	Astronum 2015	08/06/2015	Avignon, France	HPC Community Scientific Community	Europe
W. Frings (JUELICH)	Description of buddy checkpointing concepts	3rd JLESC Workshop	29/06/2015	Barcelona, Spain	HPC Community	Europe
D. Alvarez Mallon (JUELICH)	DEEP and DEEP-ER: From a Concept to Application Reality	ISC'15	01/07/2015	Jülich, Germany	HPC Community Scientific Community	International
D. Alvarez Mallon (JUELICH)	DEEP & DEEP-ER: European HW and SW Innovations on the Way to Exascale	Third NESUS Working Groups Meeting	02/07/2015	Leuven, Belgium	HPC Community Scientific Community	Europe
J. Amaya (KU Leuven)	The Numerical Magnetosphere: Fully Kinetic Simulations of the Solar Wind–Magnetosphere Interaction	12th International School/Symposium for Space Simulations (ISSS-12)	03/07/2015	Prague,	Czech Republic	Europe
M. E. Innocenti (KU Leuven)	Performance Analysis of the Multi-level Multi-domain Approach on Emerging Computing Architectures	12th International School/Symposium for Space Simulations (ISSS-12)	03/07/2015	Prague,	Czech Republic	Europe
F. Bacchini (KU Leuven)	New Approaches to Large Scale Particle in Cell Simulations based on Fluid Methods Applied to Emerging Hybrid Architectures	12th International School/Symposium for Space Simulations (ISSS-12)	03/07/2015	Prague,	Czech Republic	Europe

H.-CH. Hoppe (INTEL) + D. Alvarez Mallon (JUELICH)	Presentation + Demo at the Intel booth	ISC'15	13/07/2015	Frankfurt, Germany	HPC Community Industry Scientific Community Media Policy Makers	International
E. Suarez (JUELICH)	Architecture Innovation with Intel Xeon Phi - presentation held at the Intel Booth	ISC'15	13/07/2015	Frankfurt, Germany	HPC Community Industry Scientific Community Media Policy Makers	International
N. Eicker (JUELICH)	Presentation at EEP Workshop: Taming Heterogeneity by Segregation	ISC'15	16/07/2015	Frankfurt, Germany	HPC Community Industry Scientific Community	International
N. Eicker (JUELICH)	Taming Heterogeneity by Segregation – An Innovative Approach to Heterogeneous Exascale Architectures	ISC'15	16/07/2015	Frankfurt, Germany	HPC Community Industry Scientific Community Media	International
V. Beltran (BSC)	Enabling Complex Applications on Heterogeneous Clusters with OmpSs MPI Offloading	13th US National Conference on Computational Mechanics	30/07/2015	San Diego, USA	HPC Community	International
G. Lapenta (KU Leuven)	Using HPC Kinetic Simulations to help the MMS mission find its target: reconnection diffusion regions	International Conference on Numerical Simulation of Plasmas	11/08/2015	Golden (Colorado), US	HPC Community Scientific Community	Europe
R. Leger (INRIA)	Assessing the DEEP-ER Cluster/Booster Architecture with a Finite-Element Type Solver for Bioelectromagnetics	ParCo 2015	01/09/2015	Edinburgh, Scotland	HPC Community Scientific Community	Europe
N. Attig (JSC)	Impacts of Current Hardware and Software Developments on Simulation Sciences	CSP 2015	08/09/2015	Moscow, Russia	HPC Community	International
N. Eicker (JUELICH)	Taming Heterogeneity by Segregation – The DEEP View on Exascale	596. WE-Heraeus Seminar “Science Applications for Exascale Computing - Exploring New Avenues towards Scalability and Fault-Tolerance”	09/09/2015	Bad Honnef, Germany	HPC Community	Germany
E. Suarez (JUELICH)	The DEEP-ER project presentation held at the Intel Theatre "An Update on European HPC Initiatives"	SC15	19/11/2015	Austin, Texas, USA	HPC Community Industry Scientific Community	International
S. Breuner (ITWM)	Presentation on DEEP-ER project during SC (at partner booth of BeeGFS)	SC15	19/11/2015	Austin, Texas, USA	HPC Community Industry Scientific Community	International

C. Clauss & T. Moschny (ParTec)	Verhalten von MPI Programmen im Fehlerfall (= Behaviors for MPI programmes when errors occur)	parallel 2016	07/04/2016	Heidelberg, Germany	HPC Community	German
J. Amaya (KU Leuven)	Innovative HPC Architectures for the Study of Planetary Plasma Environments	EGU Conference 2016	17/04/2016	Vienna, Austria	Scientific Community	International
J. Amaya (KU Leuven)	Towards exascale simulations of space plasmas using the DEEP-ER architecture	EASC 2016	28/04/2016	Stockholm, Sweden	Scientific Community HPC Community	International
E. Suarez (JUELICH)	The DEEP and DEEP-ER Projects	EXDCI Workshop at European HPC Summit Week	10/05/2016	Prague, Czech Republic	HPC Community	International
C. Manzano (JUELICH)	BeeGFS in the DEEP-ER Project	BeeGFS User Meeting	17/05/2016	Kaiserslautern, Germany	HPC Community	International
F. Kautz (Fraunhofer ITWM)	BeeGFS User APIs	BeeGFS User Meeting	17/05/2016	Kaiserslautern, Germany	HPC Community	International
E. Suarez (JUELICH)	Technology Emerging from the DEEP and DEEP-ER projects	EMiT Conference	03/06/2016	Barcelona, Spain	HPC Community Industry Scientific Community	International
J. Schmidt (UHEI)	Network Attached Memory - Presentation at the PhD Forum	ISC'16	20/06/2016	Frankfurt, Germany	HPC Community	International
I. Zacharov (Eurotech)	Aurora Tigon v4 with KNL, a system from research for research (presentation at the Intel Collaboration Hub)	ISC'16	20/06/2016	Frankfurt, Germany	HPC Community Scientific Community	International
E. Suarez (JUELICH)	The DEEP-ER Project (presentation at the Intel Collaboration Hub)	ISC'16	21/06/2016	Frankfurt, Germany	HPC Community Industry Scientific Community	International
N. Eicker (JUELICH)	Hardware Prototyping in DEEP-ER presentation at ISC'16 Workshop	ISC'16	23/06/2016	Frankfurt, Germany	HPC Community Industry Scientific Community	International
R. Leger (INRIA)	A feedback on approaching the DEEP-ER platform with a DGTD-based simulation software for Bioelectromagnetics applications	ISC'16	23/06/2016	Frankfurt, Germany	HPC Community Industry Scientific Community	International
E. Suarez (JUELICH)	DEEP-ER Cooling Concept	KIT-JSC Meeting	01/07/2016	Karlsruhe, Germany	HPC Community Industry Scientific Community	Germany
N. Eicker (JUELICH)	Taming Heterogeneity in HPC - Keynote	SAI Computing Conference 2016	15/07/2016	London, GB	Industry Scientific Community	International
E. Suarez (JUELICH)	The future of Supercomputing	Kleine Nacht der Wissenschaft, Kulturbahnhof Jülich	02/09/2016	Jülich, Germany	General Public	Germany

Congiu, G. (Seagate)	Improving Collective I/O Performance Using Non-Volatile Memory Devices	IEEE Cluster 2016	13/09/2016	Teipei, Teiwan	HPC Community Industry Scientific Community	International
J. Schmidt (UHEI)	Exploring Time and Energy for Complex Accesses to a Hybrid Memory Cube	Memsys 2016	04/10/2016	Washington, USA	HPC Community Industry Scientific Community	International
J. Schmidt (UHEI)	Doctoral Showcase NAM	SC16	15/11/2016	Salt Lake City, USA	HPC Community Industry Scientific Community	International
N. Eicker (JUELICH)	Modular Supercomputing - Talk at Intel Community Hub	SC16	17/11/2016	Salt Lake City, USA	HPC Community Industry Scientific Community	International
W. Frings (JUELICH)	"HPC-Tools JUBE, LLview and SIONlib at JSC: Recent developments" (presentation containing DEEP-ER's buddy checkpointing and NAM-XOR-checkpointing using SIONlib)	JLESC Workshop	01/12/2016	Kobe, Japan	HPC Community Industry Scientific Community	International
E. Suarez (JUELICH)	Keynote: Modular Supercomputing: the DEEP approach to hardware heterogeneity	ISUM 2017 (8th International Supercomputing Conference In Mexico)	02/03/2017	Guadalajara, Mexico	HPC Community Scientific Community	International
E. Suarez (JUELICH)	Round-table: Women in TICS: Women at Technology World	ISUM 2017 (8th International Supercomputing Conference In Mexico)	03/03/2017	Guadalajara, Mexico	HPC Community Scientific Community	International
J. Romein (Astron)	Image-Domain Gridding on Graphics Processors	IEEE International Parallel and Distributed Processing Symposium (IPDPS'17), Orlando, FL, May 2017	29/05/2017	Orlando, Florida	HPC Community Scientific Community	International

Media Coverage

Publication	Title	Date	Event	Audience
Exascale Newsletter JSC	Safer and Faster with DEEP-ER	01/11/2013		Scientific Community HPC Community Industry Policy Maker Media
Newsletter JSC	Start of the Exascale Projects DEEP-ER and Mont-Blanc 2	01/11/2013		Scientific Community HPC Community Industry Policy Maker Media
inside	Going DEEP-ER into Exascale	01/04/2014		Scientific Community HPC Community
GA-Infobrief	Neues EU-Projekt DEEP-ER	15/04/2014		Scientific Community HPC Community
ISC'14 Blog	Smart Acceleration for Clusters	18/06/2014	ISC'14	HPC Community Industry Scientific Community Media Policy Makers
insideHPC	DEEP and DEEP-ER Project Updates: Video	01/07/2014	ISC'14	HPC Community Industry Scientific Community
International Innovation	Extreme Computing	22/07/2014		HPC Community Industry Scientific Community Policy Makers
Intel European Exascale Labs Report 2013	DEEP-ER: Bringing Europe Closer To Exascale	01/09/2014		HPC Community Industry Scientific Community
iSGTW	Working to Make Exascale Supercomputing A Reality (Image Video)	25/02/2015		HPC Community Industry Scientific Community
Scientific Computing World	Europe's Exascale on Display	01/04/2015	PRACEdays15	HPC Community Industry Scientific Community Policy Makers
insideHPC	Europe's Exascale on Display	05/04/2015	PRACEdays15	HPC Community Industry Scientific Community Policy Makers
Scientific Computing World	ISC'15 High Performance Show Preview	01/06/2015	ISC'15	HPC Community Industry Scientific Community Policy Makers
Primeur Magazine	DEEP/-ER at ISC'15	11/06/2015	ISC'15	HPC Community Industry Scientific Community Policy Makers Media
ISC'15 Blog	Survival Machine and Surviving the Machine	23/06/2015	ISC'15	HPC Community Industry Scientific Community

Publication	Title	Date	Event	Audience
idw Online	Eurotech delivers the "Booster" system to Jülich to complete the DEEP supercomputer	14/07/2015	ISC'15	HPC Community Industry Scientific Community Media
insideHPC	Eurotech Delivers Booster to DEEP Project	16/07/2015	ISC'15	HPC Community Industry Scientific Community
HPCwire	Eurotech Delivers "Booster" System to Jülich to Complete DEEP Supercomputer	16/07/2015	ISC'15	HPC Community Industry Scientific Community
Scientific Computing	Booster System Installed at Jülich, Completes DEEP Supercomputer	17/07/2015	ISC'15	HPC Community Industry Scientific Community
insideHPC	Extoll rolls out Tourmalet Network Chip at ISC'15	22/07/2015	ISC'15	HPC Community Industry Scientific Community
Innovations Report	Extoll Introduces HPC Network Chip Tourmalet	22/07/2015	ISC'15	HPC Community Industry Scientific Community
insideHPC	DEEP Moves Towards Exascale	03/08/2015	ISC'15	HPC Community Industry Scientific Community
Primeur Magazine	European Exascale Projects DEEP-ER and Mont-Blanc to Investigate New Exascale Technologies (VIDEO)	10/08/2015	ISC'15	HPC Community Industry Scientific Community
Primeur Magazine	European Exascale Projects DEEP-ER and Mont-Blanc to Investigate New Programming and Network-attached Memory technologies	10/08/2015	ISC'15	HPC Community Industry Scientific Community
Primeur Magazine	Demonstration: technology developments of the exascale project DEEP-ER	10/08/2015	ISC'15	HPC Community Industry Scientific Community
Primeur Magazine	System monitoring for energy efficiency in the Mont-Blanc and DEEP-ER project	29/09/2015	ISC'15	HPC Community Industry Scientific Community
Primeur Magazine	Developing Hardware for the Exascale Era	06/10/2015	ISC'15	HPC Community Industry Scientific Community
Intel European Exascale Labs Report	DEEP and DEEP-ER: Brining Europe Closer to Exascale	31/12/2015		HPC Community Industry Scientific Community
insideHPC	BeeGFS Parallel File System goes OpenSource	23/02/2016		HPC Community Industry Scientific Community
HPCwire	BeeGFS Parallel File System now OpenSource	23/02/2016		HPC Community Industry Scientific Community
Scientific Computing World	BeeGFS Parallel File System now OpenSource	23/02/2016		HPC Community Industry Scientific Community

Publication	Title	Date	Event	Audience
Primeur Magazine	Exascale project DEEP-ER to present at CEBIT	01/03/2016	CeBIT 2016	HPC Community Industry Scientific Community
ScienceNode	Boosting Science with the next generation of supercomputers	16/03/2016		HPC Community Scientific Community
Scientific Computing World	ISC'16 Show Preview	01/06/2016	ISC'16	HPC Community Industry Scientific Community
ISC'16 Blog	Programming Models: Slow transition or complete disruption?	10/06/2016	ISC'16	HPC Community Industry Scientific Community
Euro Exa Homepage	Europe Towards Exascale - A Lookback on 5 Years of European Exascale Research Collaboration	14/06/2016	ISC'16	HPC Community Industry Scientific Community
INSIDE	DEEPprojects at CeBIT 2016	15/06/2016	CeBIT 2016	HPC Community Scientific Community
insideHPC	Extoll Network Chip enables network attached accelerators	17/06/2016	ISC'16	HPC Community Industry Scientific Community
insideHPC	DEEP-ER Project Moves Europe Closer to Exascale	05/07/2016	ISC'16	HPC Community Industry Scientific Community
DataCenter Insider	Supercomputing neu gedacht	05/07/2016		HPC Community Industry
Top500 blog	A Dive into DEEP-ER, Exascale Research with a Distinctly Europea Flair	18/07/2016		HPC Community Industry Scientific Community
Top500 blog	EXTOLL's Network Marches to the Beat of a different Drummer	25/07/2016		HPC Community Industry Scientific Community
YouTube	Taming Heterogeneity in HPC - Keynote	08/08/2016	SAI Computing Conference 2016	HPC Community Industry Scientific Community
insideHPC	New Report Looks at European Exascale Projects	12/08/2016	ISC'16	HPC Community Industry Scientific Community
insideHPC	Taming Heterogeneity in HPC - The DEEP-ER take	19/08/2016	SAI Computing Conference 2016	HPC Community Industry Scientific Community
Europa.eu	Europe towards Exascale	02/09/2016	n/a	HPC Community Industry Scientific Community
HPCwire	HPCwire Readers' Choice Award 2016 (category: academia-industry collaboration)	30/09/2016	SC16	HPC Community Industry Scientific Community
INSIDE	Prototyping next-generation supercomputing architectures - report on ISC'16 workshop	01/10/2016	ISC'16	HPC Community Industry Scientific Community

Publication	Title	Date	Event	Audience
Mitarbeitermagazine des Forschungszentrums Jülich (Employee Magazine by FZJ)	Internationale Forschungsk Kooperationen: Gemeinsam Stark (Interview + article in German on international collaboration)	01/10/2016		HPC Community Scientific Community
HPCwire	Advancing Modular Supercomputing with DEEP and DEEP-ER	24/02/2017		HPC Community Industry Scientific Community
JüLICHT	Jülicher Forscherin geht in die Computertiefe	08/03/2017	International Women's Day	General Public

List of Acronyms and Abbreviations

A

B

- BADW-LRZ:** Leibniz-Rechenzentrum der Bayerischen Akademie der Wissenschaften.
Computing Centre, Garching, Germany
- BoF:** Birds of a Feather Session
- BoP:** Board of Partners for the DEEP-ER project
- BSC:** Barcelona Supercomputing Centre, Spain
- BSCW:** Basic Support for Cooperative Work, Software package developed by the Fraunhofer Society used to create a collaborative workspace for collaboration over the web

C

- CD:** Corporate Design
- CI:** Corporate Identity
- CRESTA:** Collaborative Research into Exascale Systemware Tools & Applications: EU-funded Exascale project.

D

- DEEP:** Dynamical Exascale Entry Platform
- DEEP-ER:** DEEP Extended Reach: this project

E

- EC:** European Commission
- EC-GA:** EC-Grant Agreement
- EEP:** European Exascale Projects
- EESI:** European Exascale Software Initiative (FP7)
- EPiGRAM:** Exascale ProGRAMming Models
- ETP4HPC:** European Technology Platform for High Performance Computing
- EU:** European Union
- Eurotech:** Eurotech S.p.A., Amaro, Italy
- Exaflop:** 10^{18} Floating point operations per second
- Exascale:** Computer systems or Applications, which are able to run with a performance above 10^{18} Floating point operations per second
- EXA2CT:** EXascale Algorithms and Advanced Computational Techniques

F

- FP7:** European Commission 7th Framework Programme.

G

H

HPC: High Performance Computing
HW: Hardware

I

ICT: Information and Communication Technologies
Intel: Intel Germany GmbH Feldkirchen,
I/O: Input/Output. May describe the respective logical function of a computer system or a certain physical instantiation
ISC: International Supercomputing Conference, Yearly conference on supercomputing which has been held in Europe since 1986

J

JUELICH: Forschungszentrum Jülich GmbH, Jülich, Germany

K

KPI: Key Performance Indicator

L**M**

Mont-Blanc: European scalable and power efficient HPC platform based on low-power embedded technology
Mont-Blanc 2: Follow-up project of Mont-Blanc
MoU Memorandum of Understanding (in this case with PRACE-4IP)

N

NAM: Network Attached Memory, nodes connected by the DEEP-ER network to the DEEP-ER BN and CN providing shared memory buffers/caches, one of the extensions to the DEEP Architecture proposed by DEEP-ER
NIC: Network Interface Card, Hardware component that connects a computer to a computer network
Numexas: NUMerical Methods and Tools for Key EXAScale Computing Challenges in Engineering and Applied Sciences
NVM: Non-Volatile Memory. Used to describe a physical technology or the use of such technology in a non-block-oriented way in a computer system

O

OmpSs: BSC's Superscalar (Ss) for OpenMP
OpenMP: Open Multi-Processing, Application programming interface that support multiplatform shared memory multiprocessing

P

ParaStationMPI: Software for cluster management and control developed by ParTec

ParTec: ParTec Cluster Competence Center GmbH, Munich, Germany
PM: Person Month or Project Manager of the DEEP-ER project (depending on the context)
PMT: Project Management Team of the DEEP-ER project
PR: Public Relations
PRACE: Partnership for Advanced Computing in Europe (EU project, European HPC infrastructure)
Project Coordinator: Leading scientist coordinating and representing the DEEP-ER project
PROSPECT: Promotion of Supercomputing Partnerships for European Competitiveness and Technology (registered association, Germany)

Q

R

R&D: Research and Development
RTD: Research and Technological Development

S

SEO: Search Engine Optimisation
SME: Small and Medium Enterprises
SRA Strategic Research Agenda (proposed by ETP4HPC)

T

TCO: Total Cost of Ownership
TER@TEC: A European industrial initiative federating industrial users, technology providers and research centres to harness HPC technologies and enlarge their usage
ToW: Team of Work Package leaders within the DEEP-ER project

U

UHEI: University of Heidelberg, Germany
USP: Unique Selling Point

V

W

WP: Work Package

X

Y

Z