SEVENTH FRAMEWORK PROGRAMME

FP7-ICT-2013-10

DEEP-ER

DEEP Extended Reach

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D2.2

First 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 first project year.

In this period of time, the main focus of the dissemination activities (task 2.1) laid on setting up the DEEP-ER website and establishing it as the central hub for all communication as well as on developing the necessary basic dissemination materials.

Next to the DEEP-ER website, two social media handles have been launched, one on Twitter and one on LinkedIn. These serve as further news channels for the whole duration of the project. At the same time they help to increase visibility, to liaise with key influencers in the HPC community and to position DEEP-ER as thought leader on Exascale topics.

Taking part in the most important conferences in the HPC area remains a key tool for dissemination activities. Hence, DEEP-ER was present at SC13 and ISC'14 and is currently planning for SC14.

Last but not least, media relations (reaching out to key journalists from e. g. HPCwire, Scientific Computing or insideHPC) have become more and more important throughout the first year of the project and will be crucial to further increase impact of our own dissemination activities in the future.

Taken together, these initiatives helped to create first awareness for the project among the relevant audiences and laid the basis for continued public outreach in the coming months. Of great importance here was also the co-operation with the other European Exascale Projects (EEP) especially for events and workshops.

Regarding business and industry co-operation (task 2.2), project partners have been very active in promoting the predecessor project DEEP and DEEP-ER in various HPC lobbying forums. Quite obviously, the current dissemination strategy also helps achieving the goals of this task. After all, these target audiences can best be reached via relevant (vertical) media as well as in person at the usual trade shows (SC, ISC, vertical trade fairs). As soon as hardware is ready, we plan to give access to test accounts as well.

In terms of training (task 2.3), the main focus was on getting new partners up to speed and knowledgeable about the DEEP and DEEP-ER Cluster Booster concept, OmpSs and Intel Xeon Phi. This has been achieved via a workshop hosted at BSC in February 2014 as well as a joint Exascale workshop with other EEP in March 2014. Further needs for trainings will be closely monitored and attended to on short notice when required.

1 Introduction

Informing the various target audiences about the progress, outcomes, results and lessons learned of the DEEP-ER project as a whole and especially on the hardware and software work on the DEEP-ER prototype is a major objective of the project.

Below you will find an updated version of how this goal is supposed to be achieved (strategy), as well as a detailed outline of the implementation of the strategy (materials, website, social media, conferences, media relations and publications).

Closely integrated with the dissemination strategy and activities are the tasks for industry and business co-operation (task 2.2). You will find an update on current initiatives below.

Last but not least, a report on training (task 2.3) and an outlook will conclude this deliverable.

2 Task 2.1: Dissemination activities

2.1 Dissemination Strategy

As laid out in the dissemination plan (D2.1), the main objective of this WP is to bring the results of the DEEP-ER project to the awareness of the scientific, industrial, political and general public.

In the beginning of the project, the website has been the main channel used to disseminate information on the DEEP-ER project. However, in an age characterised by an information explosion, this approach will not be sufficient anymore.

Therefore, the dissemination strategy has been re-thought over the past couple of months and updated accordingly to be able to increase the impact of our dissemination activities.

As from now on, the dissemination strategy for the DEEP-ER project will be based on three pillars: owned media, earned media and paid media.

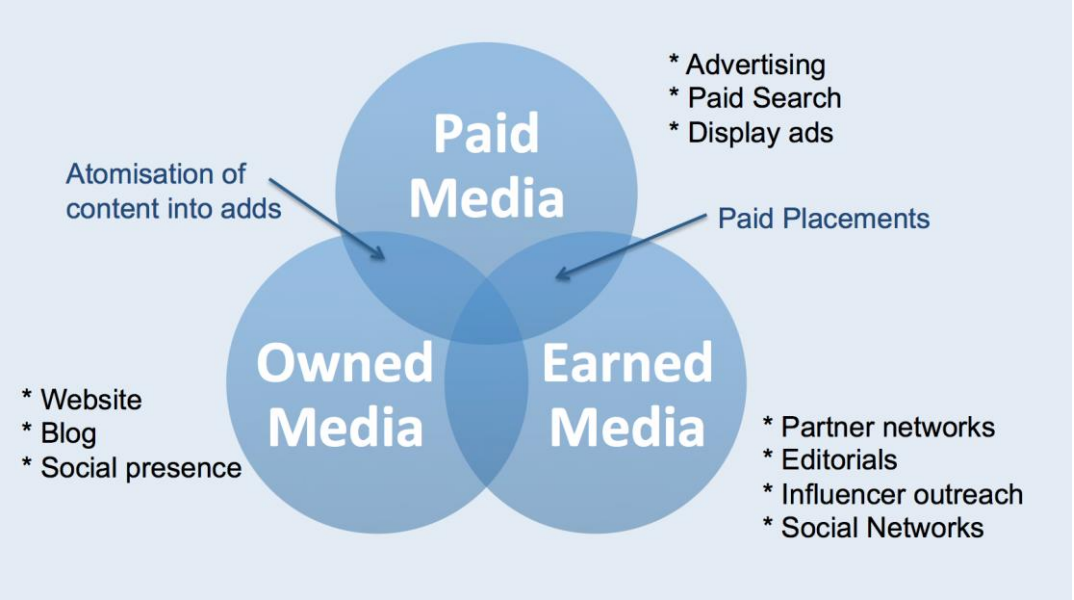


Figure 1: The 3 key constituents of our PR strategy

2.1.1 Owned media

Talking about owned media usually means talking about dissemination channels one has (almost) full control over. In the case of DEEP-ER our own channels are the website, as well as two social media channels (LinkedIn and Twitter).

It needs to be underlined, that these three channels are and still will form the hub of all dissemination activities in the future. These presences are interlinked closely and explicitly refer to each other. The idea is to increase visits to our DEEP-ER website through raising awareness via our social media channel.

However, to increase impact and to be able to address all relevant target audiences via the right channels, we have to broaden our horizon and include further channels into our media mix.

2.1.2 Earned media

Most important in this respect are earned media. Usually this means key (traditional) media publications in a certain field. In the HPC area, these are for sure HPCwire, insideHPC, Scientific Computing World, Scientific Computing and the like. But also social media channels (owned by others) can be added to this category.

These channels are called “earned” media, because you have to earn a way in by establishing close relationships to the editors or social media influencers. You have to keep them continuously up-to-date and offer interesting content, so that they report on your topics or mention them on their social media profiles even without you paying for it.

The reason they are so important is because they are attributed a high credibility within the community and they reach a broad audience. Hence, getting into these magazines or being referred to on social media by key influencers will help increase the number of people interested in the DEEP-ER project.

2.1.3 Paid media

Paid media is usually classic advertising or paid online marketing campaigns. However, paid placements also fall into this category. The latter one is actually what we are considering in DEEP-ER – however, only given the cost-benefit ratio is acceptable.

Paid media again helps in widening the audience in terms of pure numbers – but also in reaching out to very specific audiences. Translated to the DEEP-ER case, especially with business and industry contacts we have to get into vertical media (e. g. media directed at the automotive industry or at life sciences). In a first step, we would always try to earn our way into these media. But given the relatively short time frame of the project and the nature of some vertical magazines, sometimes it makes sense to pay for an advertorial article.

2.1.4 Dissemination tactics

Concerning the PR tactics we apply, the saying “content is king” still holds true. Be it on our website, on social, earned or owned media: We have to make sure to produce quality content. Content can come in various formats however: It can include press releases, newsletters, opinion articles, blog posts, info graphics and more.

Apart from content creation, events are a crucial PR tactic for us. After all, both SC and ISC conferences are utterly important for reaching out to our relevant audiences on a more personal level. Here we benefit a lot from the co-operation with EEP partners that enable us to have a strong presence at the shows.

To sum it up: The tactics mentioned in 2.1.4 help us to raise awareness via our own channels as well as via earned and paid media. Regarding our own channels, it is key, that we manage to make people visit our website by triggering them on social media channels. This helps us tremendously making the DEEP-ER website more known within the HPC community. In terms of earned media, the tactics will help us build and intensify relations with key influencers in traditional and new media to make them speak for us to the broader HPC community.

In the following you will find a review of what content has been created (materials) and how it has been used for owned, earned and paid media. Additionally, an overview is provided on DEEP-ER engagement at events.

2.2 Materials

During the first project year it was most important to create initial basic dissemination material. Thus we wanted to make sure to establish a professional and coherent public appearance by developing a professional Corporate Design (CD) and Corporate Identity (CI). On top, the material was supposed to help educating all relevant target groups with basic information. The materials include:

- A DEEP-ER logo + corporate design for the website and all other dissemination material. (Note: This has been presented for D2.1 already)
- A joint logo for DEEP and DEEP-ER to be used at all times when the projects are presented as an on-going joint effort to the public (e. g. in social media, see reasoning below)
- The DEEP-ER website was set-up (according to the CI defined).
- A fact sheet and a standard presentation giving a first overview on the project to interested external publics
- For the trade shows SC13 and ISC'14, a flyer on the DEEP-ER project has been developed and updated accordingly; a new one is under preparation now

Figure 2: Joint logo for DEEP and DEEP-ER

All materials are to be found on the internal document sharing platform BSCW server. Those of interest to the public can be downloaded on the DEEP-ER website: http://www.deep-er.eu/press-corner/materials.

2.3 Website

The website was set-up as described in the dissemination plan D2.1. Throughout the last couple of months, the website has been continuously updated and improved regarding both, the technical updates (e. g. software patches) as well as in terms of content.

2.3.1 New categories and content

With the project evolving over time, new pieces of content could be developed. At the same time, it became obvious that the initial set-up needed some updates to better highlight key messages and to better cater to the needs of our audiences. Above all, most enhancements were related to:

- Updating existing content (e. g. the intro on the homepage, the general project information)
- Creating new content (e. g. "Behind the scenes" content mostly consisting of interviews with project partners, new texts on software and hardware)
- Adding new categories (e. g. press corner with various sub-categories)
- Applying (basic!) on-page search engine optimisation (SEO) strategies (e. g. re-working texts to include keywords, continuous use of key words for new texts, internal links, regular content updates etc.)
- Integrating social media handles

Figure 3: New "look" of DEEP-ER homepage

2.3.2 Statistics

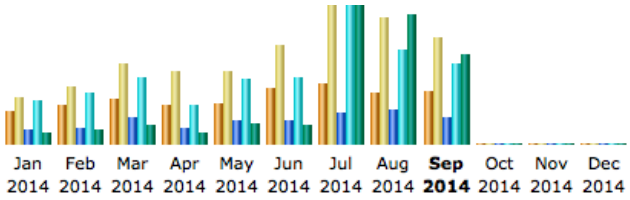
We have selected the following web statistics to be used as key performance indicators (KPIs) for tracking the success of the DEEP-ER website.

Most important to us are the following:

- Unique visitors
- Page views
- Visits
- Countries
- Timing (what days of the week and what hours of the day are most popular)
- Content

Regarding the unique visitors, page views and visits, figure 4 clearly indicates a continuous growth since the official launch of the website at the end of 2013.

This growth most likely coincides with the fact that the project matured over time and more content was created. Taking a closer look at the data, it shows that most interest was generated between June and August 2014. The reason for this is twofold: First, the increased dissemination activities around ISC'14 in June this year stirred quite some interest in external publics. Second, this overlaps with the start of our DEEP and DEEP-ER Twitter channel. The idea of this social media channel is to link to DEEP-ER content on the website as often as possible. Due to the hash tags used on Twitter, the posts are visible to a far greater community than one that knows our website from other encounters.

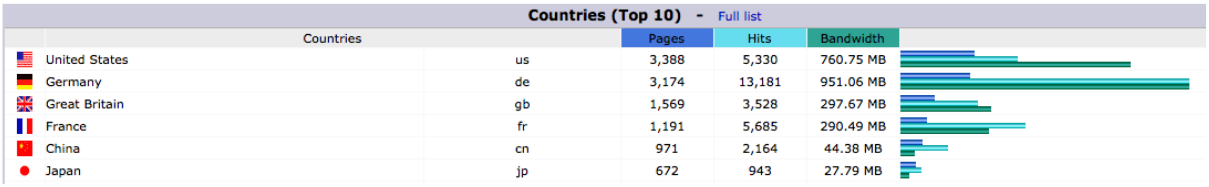


Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2014	277	390	1,086	3,221	102.59 MB
Feb 2014	322	486	1,134	3,703	128.28 MB
Mar 2014	381	678	1,916	4,923	173.66 MB
Apr 2014	325	605	1,144	2,876	104.65 MB
May 2014	341	604	1,704	4,773	181.65 MB
Jun 2014	463	826	1,760	4,847	168.66 MB
Jul 2014	504	1,154	2,248	10,075	1.19 GB
Aug 2014	432	1,055	2,531	6,896	1.13 GB
Sep 2014	437	890	1,973	5,864	794.81 MB
Oct 2014	0	0	0	0	0
Nov 2014	0	0	0	0	0
Dec 2014	0	0	0	0	0
Total	3,482	6,688	15,496	47,178	3.93 GB

Figure 4: Web statistics DEEP-ER website

In terms of country, it is rather intriguing that we obviously get quite some attention from the US – followed by Germany and Great Britain. This is especially noticeable since we try to

establish or at least connect to a HPC or Exascale community reaching across continents together with our EEP partners.



Countries (Top 10) - Full list

Countries		Pages	Hits	Bandwidth
United States	us	3,388	5,330	760.75 MB
Germany	de	3,174	13,181	951.06 MB
Great Britain	gb	1,569	3,528	297.67 MB
France	fr	1,191	5,685	290.49 MB
China	cn	971	2,164	44.38 MB
Japan	jp	672	943	27.79 MB

Figure 5: DEEP-ER web statistics by country

Concerning timing and content, statistics on these aspects actually help us improve our content and tailor it more to the needs of our audience. The figures on content let us conclude on what is more popular with our readers and what is not – this means we are able to react and create more of the content that is well received. For the DEEP-ER website this is mostly updates or news from the applications part of the project, as well as behind the scenes content (e. g. interviews, short news or blog entries). From the details of timing we can infer when it makes most sense to upload newly created content. Figures show, that this is the case in the mornings from 10 to 11am and then again in the afternoon between 1 and 4pm. This actually allows us to conclude as well that the strategy of using social media to make people visit our website works. After all, studies show that the hours in the afternoon coincide with highest numbers of usage on Twitter.

2.4 Social Media

Next to the DEEP-ER website, two social media handles have been launched, one on Twitter and one on LinkedIn. Apart from serving as two more channels for disseminating project news and results, these presences will help to:

- Increase the visibility of the DEEP-ER project within the HPC community
- Build and foster relationships with key influencers in the HPC / Exascale community
- Actively participate in discussions on Exascale topics
- Position DEEP-ER as a thought leader on various topics in Exascale research

It has to be mentioned, however, that both the Twitter and the LinkedIn channel are joint handles. They represent DEEP and DEEP-ER at the same time. The reason behind is twofold: First, genuine content is not abound in neither of those projects. Since with respect to their substance both projects are inseparably related, it makes sense to promote them as continuous initiatives. Secondly and more importantly even: We try to reach the same target group. It does not make much sense to cannibalise these efforts launching individual channels for DEEP and DEEP-ER. It is highly unlikely that an audience would follow two channels with very similar content and more or less the same consortium behind.

2.4.1 Twitter

The Twitter channel has been launched in the run-up to ISC'14. Strategically this was the perfect timing since we could expect discussions in the HPC community to be at their height around this time of the year. This gave us tremendous opportunities to bandwagon and rise first awareness.

In terms of KPIs, we monitor the following:

- Absolute numbers of followers

- Mentions and re-tweets
- Interactions

Figure 6: DEEP and DEEP-ER Twitter handle, showing number of tweets, followers and interactions

As of now (end of September 2014), we have 84 followers in total. The absolute number is thus not as high yet as we want it to be. But, gaining followers on Twitter is more of a mid- and long-term goal. It takes tremendous effort and numbers usually do not grow exponentially from the beginning.

However, when it comes to re-tweets, mentions and interactions we have been quite successful already. The tweet in the screenshot is a perfect example for this: Within a couple of minutes we have already achieved five direct re-tweets. Over night (due to the different time-zones in EU and USA), the tweet has been picked-up by the official Supercomputing14 handle, who re-tweeted to over 6000 followers referencing us. Basically this tweet stands as a pars pro toto for our overall Twitter engagement.

We will keep up the good work and try to gain more followers continuously.

You can find our Twitter channel here: https://twitter.com/DEEPprojects

2.4.2 LinkedIn

The LinkedIn channel has been set-up already for SC13 last year – mainly for the same reasons we chose ISC for launching Twitter in 2014.

Figure 7: The DEEP and DEEP-ER LinkedIn group

Whereas Twitter is more useful for us to raise awareness amongst a very broad audience, LinkedIn is specifically great in targeting a business and industry community.

For LinkedIn, suitable KPIs are:

- Absolute number of group members
- Interactions
  - Discussions resulting from posts
  - Variety of people posting to the group (meaning, ideally not only group managers post to the group, but also "regular" members)

It has to be admitted, that first efforts have not been entirely fruitful. There are various reasons for this: First, we had to set it up as a LinkedIn "group" and not as "company profile". For the latter one, LinkedIn gives you more freedom and benefits in reaching out to other LinkedIn members – with a group, these options are way more limited. Second, due to the nature of LinkedIn compared to e. g. Twitter, we need different kind of content and above all more genuine content. Hence, posts have not been too frequent as of yet. Third, the group so far consists mainly of people internal to the project, whereas it would probably stir discussions a lot more having external people commenting and participating.

We have intensively thought about these challenges and have come up with a strategy that will allow us to make more of the benefits of a business social network like LinkedIn. The two main actions within the second year of the project will be to research and directly invite key influencers to take part in our group. On top, we will have certain people on the project be more active in existing HPC and Exascale groups to raise awareness for DEEP-ER in these existing groups with high member numbers.

You can find the LinkedIn group here: http://linkd.in/1q2A8Tj

2.5 Media Relations and Publications

During the first project year, the focus was on establishing relations with key journalists in the HPC area. Especially Tom Wilkie from Scientific Computing and Rich Bruckner from insideHPC showed great and on-going interest in the project. These relations will be strengthened over the coming two years and new relationships are aspired for, e. g. with Nicole Hemsoth from HPCwire or country-specific ones like Andreas Stiller from German c't.

Below you find an overview on all publications achieved within the first year. You can see that we have made use of all channels that we had access to, disseminating results also via magazines and newsletters from e. g. the partners' institutions.

- **Press release from the Forschungszentrum Juelich,** 09.10.2013. Published online: http://www.fz-juelich.de/SharedDocs/Pressemitteilungen/UK/DE/2013/13-10-09-DEEPER.html. Open Access: Yes
  - E.Suarez (JUELICH): "Mit DEEP-ER noch schneller zum Exascale-Rechner".

- **Exascale -** Newsletter of Forschungszentrum Jülich on Supercomputing, Nr. 03/2013, p. 3. Published online: http://www.fz-juelich.de/SharedDocs/Downloads/PORTAL/EN/publications/exascale-newsletter/exascale_nl_03_2013.pdf?__blob=publicationFile. Open Access: Yes
  - Ch.Hohlfeld (JUELICH): "Faster and Safer with DEEP-ER".

- **JSC News.** No. 217, November 2013. Published online: http://www.fz-juelich.de/ias/jsc/EN/News/Newsletter/newsletter_node.html. Open Access: Yes
  - E.Suarez (JUELICH): "Start of the Exascale Projects DEEP-ER and Mont-Blanc 2"

- **inSiDE; Innovative Supercomputing in Deutschland.** Published twice a year by The German National Supercomputing Centres HLRS, LRZ, JSC. Open Access: yes.
  - E.Suarez, N.Eicker (JUELICH): "Going DEEP-ER to Exascale" (submitted in March 2014)
- **Article in the newsletter Gauss Alliance Infobrief No.26.** Published online: http://www.gauss-allianz.de/de/infobrief/382-infobrief-nr-26, "Neues EU-Projekt DEEP-ER" (in German)
- **ISC Blog: Smart Acceleration for Clusters**. Published online: http://www.isc-events.com/isc14/isc_blog/items/smart-acceleration-for-clusters.html
- **HPCWire: Manufacturing Exascale**. Published online: http://www.hpcwire.com/2014/07/07/manufacturing-exascale/
- **Scientific Computing; Architectural Approaches to Energy Efficient Exascale.** Published online: http://www.scientific-computing.com/news/news_story.php?news_id=2527
- **insideHPC; New Approaches to Energy Efficient Exascale.** Published online: http://insidehpc.com/2014/07/architectural-approaches-energy-efficient-exascale/
- **International Innovation: Extreme Computing;** Published online: http://www.deeper.eu/files/IntInnovation_DEEP_DEEP-ER.pdf
- **Primeur Magazine: Six European Exascale projects are dealing with the hardware and software challenges in Exascale.** Published online: http://primeurmagazine.com/weekly/AE-PR-08-14-37.html
- **insideHPC: DEEP & DEEP-ER Updates at ISC**. Published online: http://insidehpc.com/2014/07/video-deep-deep-er-project-updates-isc14/

—> Videos are also available on Youtube:

- **Rich Report:** Applications for the DEEP & DEEP-ER projects https://www.youtube.com/watch?v=oKwKuulwrwA
- **RichReport:** DEEP & DEEP-ER project updates https://www.youtube.com/watch?v=flO-KOn3qKE

2.6 Events and Conferences

The International Supercomputing (ISC) in spring in Germany and the Supercomputing (SC) in autumn in the US are the two most important events in the calendar of the HPC community. Hence it is almost mandatory to join these events and use them as best as we can to disseminate our project results.

2.6.1 SC13

SC13 was basically the kick-off for dissemination activities around DEEP-ER, since it took place shortly after the official project start. Naturally, this was all about getting out the news about the project start and sharing the idea of the concept and the general objectives.
Activities included:

- Joint dissemination activities with European Exascale Projects (at that time: DEEP, CRESTA, Mont-Blanc), including:
  - Sharing a booth
  - Co-hosting a BoF session
  - Creating a joint EEP flyer
  - Give-aways
    - Small notebook
    - Polar neck (“Warming up for Exascale”)

Figure 8: Joint EEP give-aways for SC13

Figure 9: EEP booth at SC13

- DEEP and DEEP-ER joint give-away
- DEEP-ER Flyer

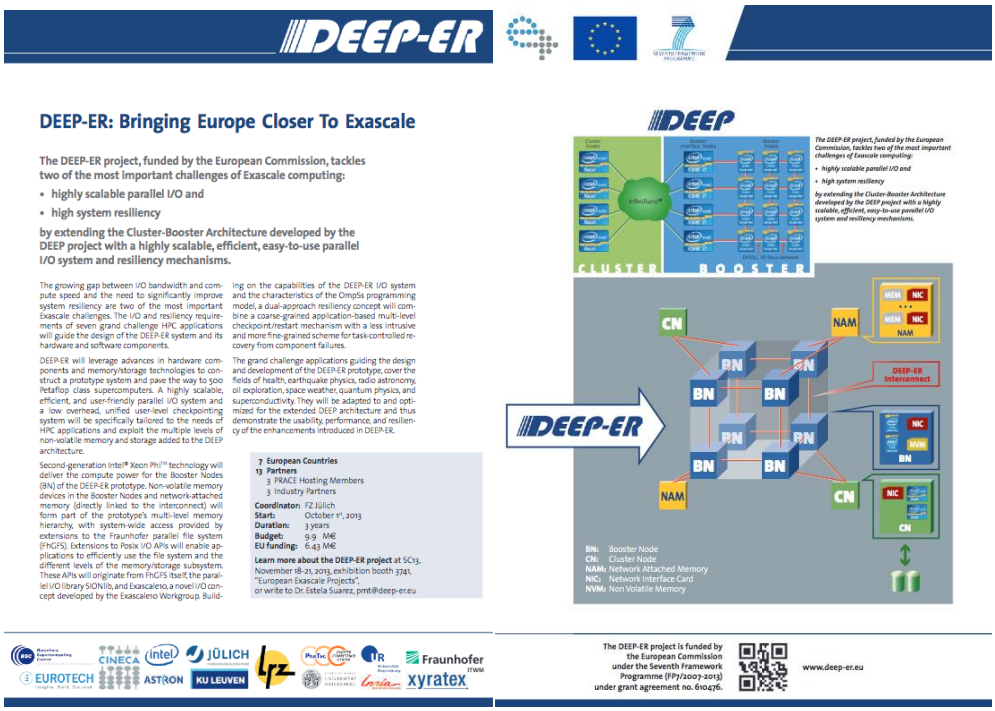


Figure 10: DEEP-ER Flyer for SC13

- DEEP-ER partners held various talks:
  - N.Eicker (JUELICH), "DEEP and DEEP-ER: Innovative Cluster architecture for Intel Xeon Phi" (Intel Theatre presentation at the Intel booth, November 18, 2013)
  - N.Eicker (JUELICH), "The DEEP Project" (presentation at BoF session: "Building on the European Exascale Approach", November 19, 2013)
  - H.Ch.-Hoppe (Intel), E.Suarez (JUELICH), "DEEP and DEEP-ER – Innovative Cluster Architectures for Intel® Xeon Phi™" (repeated presentations at the Intel booth, November 18-21, 2013)
  - E.Suarez (JUELICH), DEEP and DEEP-ER presentation and discussion at the Panel "Emerging Technologies and Big Data (Euro-Centric)", November 21, 2013
  - N.Eicker (JUELICH), interview to Computer World
  - E.Suarez (JUELICH), video interview on DEEP and DEEP-ER, as part of the "Discover Your Parallel Universe video project" series, November 21, 2013.

2.6.2 ISC'14

ISC'14 was quite a success in terms of public outreach: Especially DEEP, DEEP-ER and Mont-Blanc have attracted quite a lot of audience at the EEP booth, the BoF was pretty crowded and press interviews went very well and resulted in great coverage. A short sum-up of the individual actions:

Booth

- Shared a booth with the other European Exascale Projects (EEP)
- Showcased hardware from DEEP & DEEP-ER
- Had many lively discussions on the projects; industry showed interest in the project (e. g. Skoda and Shell) → as soon as we have a test environment ready, we will probably give these interested external stakeholders access to it

Figure 11: EEP booth ISC'14

BoF

- Hosted BoF on "European Approach to Exascale" together with the other European Exascale Projects (EEP)
- More than 70 people attending
- Great moderator: Fred Streitz, Chief Computational Scientist at Lawrence Livermore National Lab
- Lively discussion after the "official" presentations
- Accompanying survey: https://de.surveymonkey.com/s/9Q3CR8L


Figure 12: EEP BoF ISC'14: Norbert Eicker (JUELICH) giving a talk on DEEP and DEEP-ER (left) and panel discussion (right)

Social Media

- Various ISC related posts on LinkedIn; we've even made it into the official ISC LinkedIn group
- Twitter outreach and interactions with key influencers present at the conference, e. g. Addison Snell, Primeur Magazine, HPCwire, insideHPC

Press

- Hosted the official press tour at our joint EEP booth
- Interview with Scientific Computing (speaker: Estela Suarez, JUELICH)
- Video interview with insideHPC (various speakers: Estela Suarez & Norbert Eicker, JUELICH; Paul Arts, Eurotech; Hans-Christian Hoppe, Intel; Juri Schmidt, UHEI)

Figure 13: Video interview with insideHPC at ISC'14 – The 'making of'

Give-Aways & Flyer

- Joint give-away EEP: beach ball

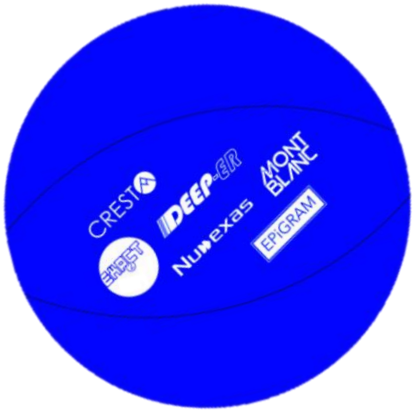


Figure 14: EEP give-away ISC'14

- DEEP & DEEP-ER give-away: name tags for luggage + candy

Figure 15: DEEP & DEEP-ER give-aways ISC'14

2.6.3 SC14

For SC14, we have basically planned the same set-up as for ISC'14: DEEP-ER will share a booth with the other EEPs, including all other joint activities (flyer, give-away). On top, we will have DEEP and DEEP-ER joint give-aways and a new DEEP-ER flyer. Apart from that, DEEP-ER has been accepted for the Emerging Technology Track of the Technical Program at SC14 with the topic "DEEP-ER I/O – and Exascale I/O Framework".. Last but not least, preparations for the DEEP and DEEP-ER image video should be finished on time for SC14 as well. At the moment preparations are under way, we are confident to have another successful trade fair.

2.6.4 Conferences

Next to being present at the big trade shows, DEEP-ER partners have been active in promoting the project at various conferences:

- **HBP Summit, Lausanne,** Switzerland, October 9, 2013
  - N.Eicker (JUELICH): "DEEP and DEEP-ER – Booster for HPC" (presentation)
- **European Research & Innovation Conference 2013**" (ERIC 2103), Nice, France, October 23, 2013
  - N.Eicker (JUELICH): "The DEEP-ER Project - Extending the reach of the Cluster-Booster Architecture" (presentation)
- **HiPEAC Conference 2014,** Vienna, Austria, January 20-22, 2014
  - Presentation of the DEEP-ER project at the Eurotech booth
- **Internal JSC PoF Begutachtung,** Juelich, Germany, March 11, 2014
  - E.Suarez (JUELICH): "The DEEP and DEEP-ER projects: co-design aspects" (presentation)
  - E.Suarez (JUELICH): "The DEEP and DEEP-ER projects: The Cluster-Booster Architecture" (poster)
- **JSC-CEA Workshop**, 28-29 April 2014, Jülich, Germany
  - E. Suarez (JUELICH): "DEEP-ER"
- **LUG2014**, Miami, USA, April 8-10, 2014
  - S. Narasimhamurthy (Xyratex): "Collective I/O for Exascale I/O Intensive Applications"
- **The Exascale Applications & Software Conference EASC**, Stockholm, Sweden, 2-3 April 2014
  - Poster by A. Jakobs (JUELICH): "DEEP-ER: Extended reach for Exascale. The Cluster-Booster-Architecture with extended resiliency features"
- **4th Brazil –France Workshop on High Performance Computing and Scientific Data Management**, Gramado, Brasil, September 15 – 18, 2014
  - R. Léger (INRIA): „A parallel Discontinuous Galerkin Time-Domain solver of Maxwell's equations"

2.7 Side note: EEP co-operation

Reading through all subsections in this chapter it should have become more then obvious that co-operation with the other European Exascale Projects (EEP) has been intensified tremendously. Usually, co-operation takes place first and foremost for the usual trade shows. But the projects have also started co-operating for workshops and trainings (see below). We think we can speak for all projects when stating that these joint efforts have been extremely fruitful in establishing a European Exascale community and increasing impact of public outreach.

It deserves special mention that both the DEEP and DEEP-ER project are taking a lead role here in organising the joint teleconferences and actively co-ordinating all the joint efforts.

3 Task 2.2: Industry and business cooperation

Within task 2.2, the aim for the first year of the project was to initiate and start building relationships with relevant industrial and business partners.

In order to establish such close links with the European industry and R&D institutions, members of the DEEP-ER partners regularly attended European HPC industry meetings such as ETP4HPC, PROSPECT, and the TER@TEC forum and represented both the DEEP and DEEP-ER project.

Overview of lobbying meetings:

- ETP4HPC Steering Board Meeting in Barcelona (Spain), November 4, 2013
- ETP4HPC Steering Board Meeting in Munich (Germany), December 9, 2013
- ETP4HPC Steering Board Meeting in Rome (Italy), Jan 23, 2014
- ETP4HPC Steering Board Meeting in Paris (France), April 8, 2014
- ETP4HPC General Assembly in Paris (France), April 9, 2014
- ETP4HPC Steering Board Meeting in Leixlip (Ireland), May 25, 2014

Additionally, DEEP-ER was also represented at the PRACE Scientific and Industrial Conference taking place in Barcelona from May 18th to May 19th. The project participated in the workshop on Exascale and Prototypes – an event co-located to the PRACE Days – with a presentation on lessons learned in the development of the DEEP and DEEP-ER prototypes. This session was also directed at an industry and business audience.

It goes without saying that the overall dissemination strategy with the activities mentioned above ties into achieving the goals of this task as well. Especially the trade fairs like SC and ISC are predestined for outreach to industry and potential IT business partners. For both SC and ISC we used lead generation tools to get hold of contact details of relevant stakeholders and start building a contact database.

But also the website and social media play an important role here: In the download section at the website we offer adequate materials (presentation and fact sheet) that give a first basic overview for industry and business contacts. And finally, LinkedIn is a particularly useful channel to reach out to this target group. The plan for the upcoming months is to take even more advantage of this channel and reach out directly to influencers on LinkedIn as well as being present more in relevant existing groups of others.

It should however not be forgotten, that at this stage of the project this task can merely start raising awareness for the DEEP-ER concept and the research under way. The activities so far will form the basis for closer co-operation towards the end of the project when it will actually be possible and feasible to make available test installations for potential business and industry users and start discussions about the real-world applicability of the outcomes.

4 Task 2.3: Training

As stated already in D2.1, a major goal of this task is to train partners new to the DEEP and DEEP-ER Cluster Booster concept and the related hardware and software peculiarities.

In order to achieve this goal, a first training workshop for the DEEP-ER application and software developers was organised on February 13th and 14th 2014 at BSC. The colleagues were familiarised with the OmpSs programming environment and the Intel® Xeon Phi™ processor and its special requirements. The attendees also had the opportunity to participate in the VI-HPS workshop on performance tools that was held at the same venue from February 10th to 12th 2014.

Additionally, a joint workshop was organised together with two other European Exascale Projects, namely CRESTA and Mont-Blanc. This event took place from March 18th to 19th in 2014 in Edinburgh and allowed participants to gain insights into all current European Exascale initiatives (CRESTA, DEEP and DEEP-ER, EPiGRAM, EXA2CT, Mont-Blanc, Numexas). The main goal of the event was to exchange ideas as well as lessons learned in various subject areas ranging from tools to programming models to innovative algorithms.

Figure 16: The EEP partners at the workshop in Edinburgh

All course material is made available to DEEP-ER partners through the BSCW document sharing platform (in the directory: /DEEP-ER/Dissemination and Training/Training). Where legally possible, the material will also be made publicly available on the DEEP-ER website (http://www.deep-er.eu/press-corner/materials)

Again as explained already in deliverable D2.1, the need for additional training is also dependent on decisions still pending in the project (e. g. networking technologies or the predominant I/O libraries to be used). Hence, Task 2.3 will closely monitor the developments and the needs of the various partners. Whenever necessary, prior trainings can be repeated or new courses can be arranged. All trainings will be announced publicly on the DEEP-ER website as well as on the DEEP-ER social media channels.

5 Outlook

Until the end of 2014, focus will lie on preparations for SC14 as well as creating an image video for DEEP and DEEP-ER.

Within the second project year as a whole, the aims are as follows:

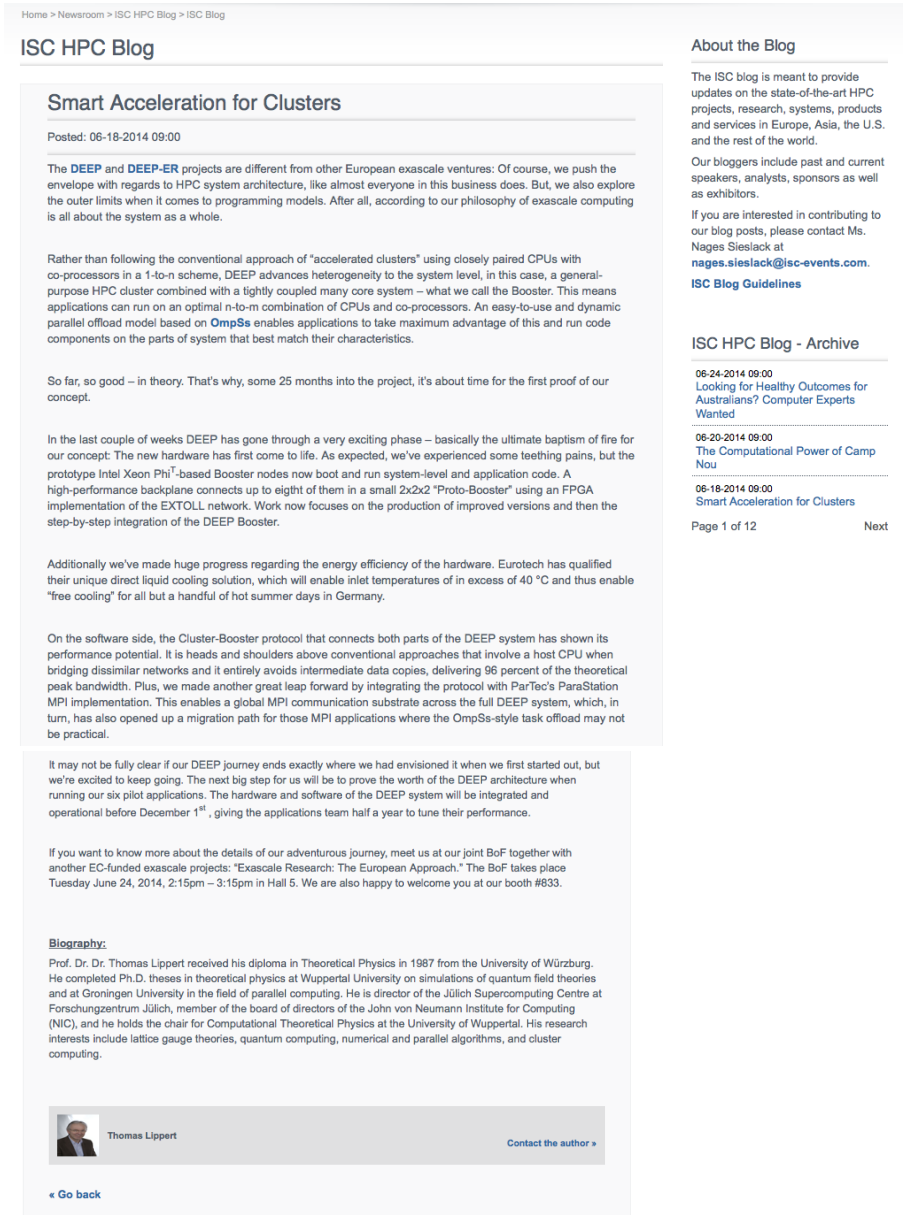
- Continue with the creation of quality content and disseminating it via the different channels (owned, earned and paid)
- Further enhance existing social media channels (Twitter and LinkedIn)
- Strengthen the relationships to key influencers in media, social media, industry and business
- Keep up and continue the excellent co-operation with the other EEP projects. There might be a special opportunity to do so for the next PRACE Days, taking place in Dublin from May 26 – 28, 2015

Annex A: Coverage Overview

The following is an overview on coverage achieved on the DEEP-ER project around ISC.

Medium: ISC Blog
Date: 18/06/2014
Topic: Project Update
Circulation: n/a

Website: http://www.isc-events.com/isc14/isc_blog/items/smart-acceleration-for-clusters.html



Home > Newsroom > ISC HPC Blog > ISC Blog

ISC HPC Blog

Smart Acceleration for Clusters

Posted: 06-18-2014 09:00

The DEEP and DEEP-ER projects are different from other European exascale ventures: Of course, we push the envelope with regards to HPC system architecture, like almost everyone in this business does. But, we also explore the outer limits when it comes to programming models. After all, according to our philosophy of exascale computing is all about the system as a whole.

Rather than following the conventional approach of "accelerated clusters" using closely paired CPUs with co-processors in a 1-to-n scheme, DEEP advances heterogeneity to the system level, in this case, a general-purpose HPC cluster combined with a tightly coupled many core system – what we call the Booster. This means applications can run on an optimal n-to-m combination of CPUs and co-processors. An easy-to-use and dynamic parallel offload model based on OmpSs enables applications to take maximum advantage of this and run code components on the parts of system that best match their characteristics.

So far, so good – in theory. That's why, some 25 months into the project, it's about time for the first proof of our concept.

In the last couple of weeks DEEP has gone through a very exciting phase – basically the ultimate baptism of fire for our concept: The new hardware has first come to life. As expected, we've experienced some teething pains, but the prototype Intel Xeon Phi^{T}-based Booster nodes now boot and run system-level and application code. A high-performance backplane connects up to eigtht of them in a small 2x2x2 "Proto-Booster" using an FPGA implementation of the EXTOLL network. Work now focuses on the production of improved versions and then the step-by-step integration of the DEEP Booster.

Additionally we've made huge progress regarding the energy efficiency of the hardware. Eurotech has qualified their unique direct liquid cooling solution, which will enable inlet temperatures of in excess of 40 °C and thus enable "free cooling" for all but a handful of hot summer days in Germany.

On the software side, the Cluster-Booster protocol that connects both parts of the DEEP system has shown its performance potential. It is heads and shoulders above conventional approaches that involve a host CPU when bridging dissimilar networks and it entirely avoids intermediate data copies, delivering 96 percent of the theoretical peak bandwidth. Plus, we made another great leap forward by integrating the protocol with ParTec's ParaStation MPI implementation. This enables a global MPI communication substrate across the full DEEP system, which, in turn, has also opened up a migration path for those MPI applications where the OmpSs-style task offload may not be practical.

It may not be fully clear if our DEEP journey ends exactly where we had envisioned it when we first started out, but we're excited to keep going. The next big step for us will be to prove the worth of the DEEP architecture when running our six pilot applications. The hardware and software of the DEEP system will be integrated and operational before December 1st , giving the applications team half a year to tune their performance.

If you want to know more about the details of our adventurous journey, meet us at our joint BoF together with another EC-funded exascale projects: "Exascale Research: The European Approach." The BoF takes place Tuesday June 24, 2014, 2:15pm – 3:15pm in Hall 5. We are also happy to welcome you at our booth #833.

Biography:

Prof. Dr. Dr. Thomas Lippert received his diploma in Theoretical Physics in 1987 from the University of Würzburg. He completed Ph.D. theses in theoretical physics at Wuppertal University on simulations of quantum field theories and at Groningen University in the field of parallel computing. He is director of the Jülich Supercomputing Centre at Forschungzentrum Jülich, member of the board of directors of the John von Neumann Institute for Computing (NIC), and he holds the chair for Computational Theoretical Physics at the University of Wuppertal. His research interests include lattice gauge theories, quantum computing, numerical and parallel algorithms, and cluster computing.

Thomas Lippert

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Our bloggers include past and current speakers, analysts, sponsors as well as exhibitors.

If you are interested in contributing to our blog posts, please contact Ms. Nages Sieslack at nages.sieslack@isc-events.com.

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Looking for Healthy Outcomes for Australians? Computer Experts Wanted

06-20-2014 09:00
The Computational Power of Camp Nou

06-18-2014 09:00
Smart Acceleration for Clusters

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Medium: Primeur Magazine
Date: 25/06/2014
Topic: EEP
Circulation: n/a

Website: http://primeurmagazine.com/weekly/AE-PR-08-14-37.html

Six European exascale projects are dealing with the hardware and software challenges in exascale

26 Jun 2014 Leipzig - *At ISC'14 in Leipzig,Primeur Magazinehad the opportunity to talk with Mark Parsons from EPCC in Edinburgh. Mark Parsons is CRESTA Project Co-ordinator and involved in a series of European exascale projects. At the ISC'14 Exhibition there was a whole booth reserverd for six European exascale projects that focus both on the hardware and software challenge in exascale.*

In the CRESTA project the software challenge is tackled. In CRESTA the hardware is not ignored. The team understands that exascale machines are hugely complex with complex memory hierarchies and many, many millions of parallel threads but the real challenge is what disruptive innovations are necessary to make codes execute properly on an exascale system. The six codes CRESTA is looking at are weather forecast, fusion modelling etc. and these codes are exactly the sort that have to run on exascale computers.

Mark Parsons went on to tell about the DEEP and DEEP-ER projects. Both projects focus on hardware and software code design whereas CRESTA focuses entirely on software. The exascale challenge is twofold. Researchers not only have to concentrate on the applications' side but also have to built new and innovative hardware. DEEP and DEEP-ER are dealing with the challenge by bringing together two types of parallel computers: on the one hand the traditional massively parallel computer and on the other hand the accelerated computer, consisting of GPUs or in this case, the Xeon Phi architecture from Intel.

DEEP and DEEP-ER are exploring how to bring these two types of architecture together to build an exascale-ready architecture.

The MONTBLANC project complements DEEP and DEEP-ER. One of the biggest challenges of exascale is obviously the power budget. Today's technologies would lead to parallel computers that would have 500 megawatt power requirements and we simply can't manage that, stated Mark Parsons. The challenge is to see how to deal with energy efficiency and this is the focus of the MONTBLANC 2 projects. These projects are taking traditional mobile technologies and deploying these for use as powerful supercomputing components in systems that are built from many of these processors to provide petascale performance and subsequently exascale performance.

MONTBLANC and MONTBLANC 2 have been looking to take the ARM Samsung technology which is used in their mobile devices and connecting them to network hardware and then building massively parallel supercomputers from these components that fit within a very strict energy budget. At the same time, the team has been looking at the whole applications' and software environment needed for this, from the operating system to the tools and parallel programmes, up to the applications themselves.

The three final projects that Mark Parsons talked about, are three smaller projects, funded after DEEP, MONTBLANC and CRESTA. They are focusing on very specific aspects of exascale. They are EPIGRAM, NUmexas and EXA2CT. These three projects focus much more on the programming model side of the exascale challenge.

EPIGRAM looks at traditional programming models which are widely used today at the petascale such as MPI, OpenMP and the PEGAS programme model and looks at how they can be used at the exascale, so committing the best bits of each of these models and combine them to form a compelling high performance, highly scalable way of programming exascale computers.

NUmexas looks at the industrial applications and the numerical methods required at the exascale. There are many challenges today on the industrial use of supercomputing where it's already suffering from the inability to scale the thousands of cores. NUmexas looks at how the researchers have to change their numerical methods in order to calculate some things that we really want to calculate at much higher scales, according to Mark Parsons.

The EXA2CT programme is looking at how programming models and software architectures can be brought together in order to tackle some of the biggest challenges we have at the exascale. How do we design codes to make them properly execute at the exascale and so many million of parallel threads?

More information is available at http://exascale-projects.eu .

Ad Emmen

Medium: insideHPC
Date: 01/07/2014
Topic: Project Update
Circulation: n/a

Website: http://insidehpc.com/2014/07/01/video-deep-deep-er-project-updates-isc14/

Home » HPC Hardware » Compute » Video: DEEP and DEEP-ER Project Updates at ISC'14

Video: DEEP and DEEP-ER Project Updates at ISC'14

July 1, 2014 by Rich Brueckner Leave a Comment

In this video from ISC'14, the DEEP and DEEP-ER Project teams describe their prototype hardware and software.

> *"The DEEP consortium will develop a novel, Exascale-enabling supercomputing architecture with a matching SW stack and a set of optimized grand-challenge simulation applications. DEEP takes the concept of compute acceleration to a new level: instead of adding accelerator cards to Cluster nodes, an accelerator Cluster, called Booster, will complement a conventional HPC system and increase its compute performance. Together with a software stack focused on meeting Exascale requirements, comprising adapted programming models, libraries and performance tools, the DEEP architecture, will enable unprecedented scalability. The Cluster-level heterogeneity of DEEP will attenuate the consequences of Amdahl's law allowing users to run applications with kernels of high scalability alongside kernels of low scalability concurrently on different sides of the system, avoiding at the same time over and under subscription. An extrapolation to millions of cores would take the DEEP concept to an Exascale level."*

See more videos from ISC'14.

Medium: Scientific Computing Worl
Date: 24/07/2014
Topic: Energy Efficiency
Circulation: n/a

Website: http://www.scientific-computing.com/news/news_story.php?news_id=2527

HPC NEWS

Architectural approaches to energy efficient exascale

24 July 2014

Tweet 5

***Tom Wilkie** reports on approaches to energy efficiency other than the cooling technologies that were very much in evidence at the International Supercomputing Conference (ISC'14) in Leipzig at the end of June*

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Medium: insideHPC
Date: 25/07/2014
Topic: Energy Efficiency
Circulation: n/a

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Website: http://insidehpc.com/2014/07/architectural9approaches9energy9efficient9exascale/!

New Approaches to Energy Efficient Exascale

July 25, 2014 by Rich Brueckner Leave a Comment

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ARM-based processors or Intel Phi co-processors could form the heart of energy-efficient architectures paving the way to exascale machines and both types of technology were on display at the International Supercomputing Conference (ISC'14) held in Leipzig at the end of June.

AppliedMicro Circuits Corporation, a California-based data centre semiconductor company, caught the attention of many delegates with its X-Gene, the first ARMv8 64-bit-based Server on a Chip solution. Sharing the same stand, SoftIron, a company based in Southampton, UK, was demonstrating how it has used the AppliedMicro X-Gene to create its enterprise-grade 64-0800 server motherboard.

A different approach, the European Dynamical Exascale Entry Platform (DEEP) project, will go live later this year at the Juelich Supercomputer Centre in Germany. It employs more 'conventional' hardware from Intel – both Xeon CPUs and Phi co-processors, but does so in an innovative architecture. As displayed at ISC'14, DEEP combines a standard InfiniBand cluster of Intel Xeon nodes, with a new, highly scalable 'booster' consisting of Phi co-processors and a high-performance 3D torus network from Extoll, the German interconnect company spun out of the University of Heidelberg. The creators of DEEP believe that the use of the Phi co-processor in this way will deliver outstanding energy efficiency. But they have not spurned the plumbing approach either and have partnered with the Italian company Eurotech to design high-precision cold plates for the booster nodes with the liquid coolant connections passing through the backplane.

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 1018 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

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

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

V

W

WP: Work Package

X

Y

Z