FP7 Support Action - European Exascale Software Initiative

DG Information Society and the unit e-Infrastructures

Addressing the Challenge of Exascale

European Exascale Software Initiative EESI

Towards Exascale roadmap implementation

EESI2 – Recommendations

International Collaboration, Funding Agencies

Jean-Yves Berthou

French National Research Agency
Head of the ICT and Mathematics dept.

The emergence of EESI… an international initiative

www.eesi-project.eu

www.exascale.org/iesp

www.exascale.org/bdec/

Build an international plan for developing the next generation open source software for scientific high-performance computing

Nov. 2008

Feb. 2009 EESI Launch

Apr 2010 EESI 1 start

Oct 2011 EESI 1 end

Sept 2012 EESI 2 start

June 2015 EESI 2 end

IESP Launch

IESP

SC08 Austin Nov. 2008

Santa Fe/US, Apr. 2009

Paris/FR, June2009

Tsukuba/Jap, Oct 2009

Oxford/UK, Apr. 2010

Maui/US, Oct. 2010

San Francisco/US, Apr. 2011

Koln/Ger, Oct. 2011

Kobe/Jap., Apr. 2012

BDEC

Charleston/US., Apr. 2013

Fukuoka/Jap., Feb. 2014

Barcelona/Spain., Feb. 2015

TO BE CONTINUED…

WP2 International Collaboration, Funding Agencies

T2.1 Funding agencies support to exascale (M1–M28) PRACE AISBL, ANR. State of the art on funding agencies, Which funding options are there for the Exascale era?

- **investigate and describe funding structures and strategies of public bodies** (worldwide) with Exascale R&D goals. EU – European (National) – G8 – International (DOE, NSF, JST, …)
- **establishing and maintaining a global network** of expertise and funding bodies in the area of Exascale computing

T2.4 Towards a public collaboration (M1-M28) – TOTAL, ANR, PRACE-INRIA

- Participate and if necessary **organize International Exascale meetings** between public and private stakeholders‘ organizations
- **Constitute** a **small group of recognized world wide exascale leaders**
- Propose governance structure, rules and missions for an International Exascale Software Initiative
- Look for potential collaboration and or coordination between Exascale centres
- **Look for potential collaboration and or coordination** on Exascale research activities, development projects and educational programs
- Establish and maintain a specific link with EC

T 2.1-T2.4 aim: give orientations and recommendations which will be reported in the deliverables of the global vision of WP7

International collaboration, BDEC actions and funding agencies relations

T2.1 Funding agencies support to exascal
ANR (Jean-Yves Berthou) State of the a
are there for the Exascale era?

- investigate and describe funding structu
(worldwide) with Exascale R&D goals

EU – European (National) – G8 – Int

- establishing and maintaining a global
area of Exascale computing

T2.4 Towards a public collaboration (J
Yves Berthou), PRACE-INRIA (Franc

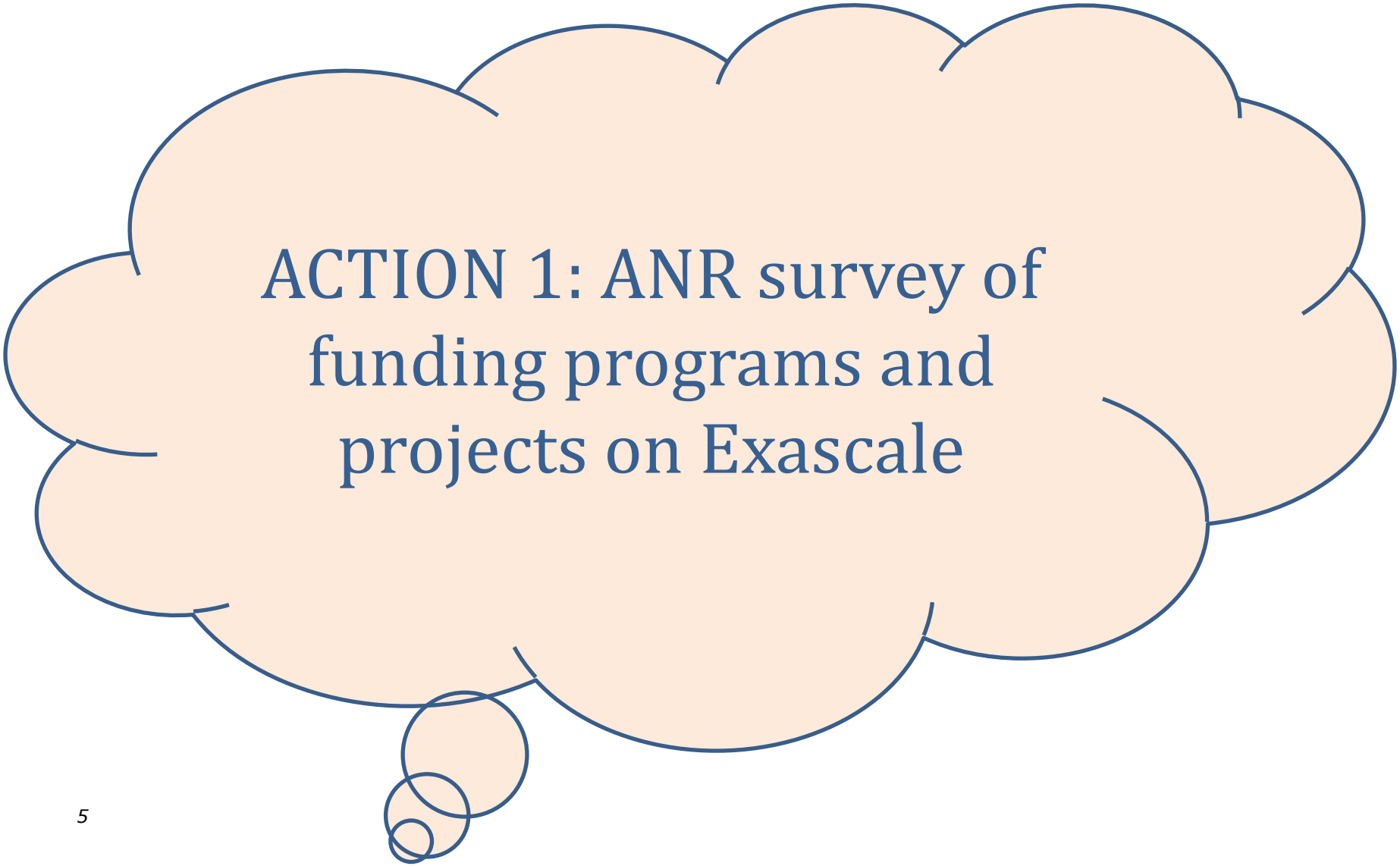
- Participate to the G8 project workshops
monitor the progresses of other, non European, countrie
IESP/EESI
- Organize an annual workshop with key Exascal
Europe, USA and Japan will support the tra
  - 1 workshop in USA in spring 2013
  - 1 workshop in Japan in spring 2014
  - 1 workshop in Europe in end of 201

ACTION 1: ANR survey of funding programs and projects on Exascale

ACTION 2: an EraNet like initiative dedicated to Exascale
=> Funding Organizations Networks
=> Follow-up G8 call and new calls on Exascale

ACTION 3: US – Japan – Europe BDEC series of workshops

International collaboration, BDEC actions and funding agencies relations



Towards Big data and Extreme computing

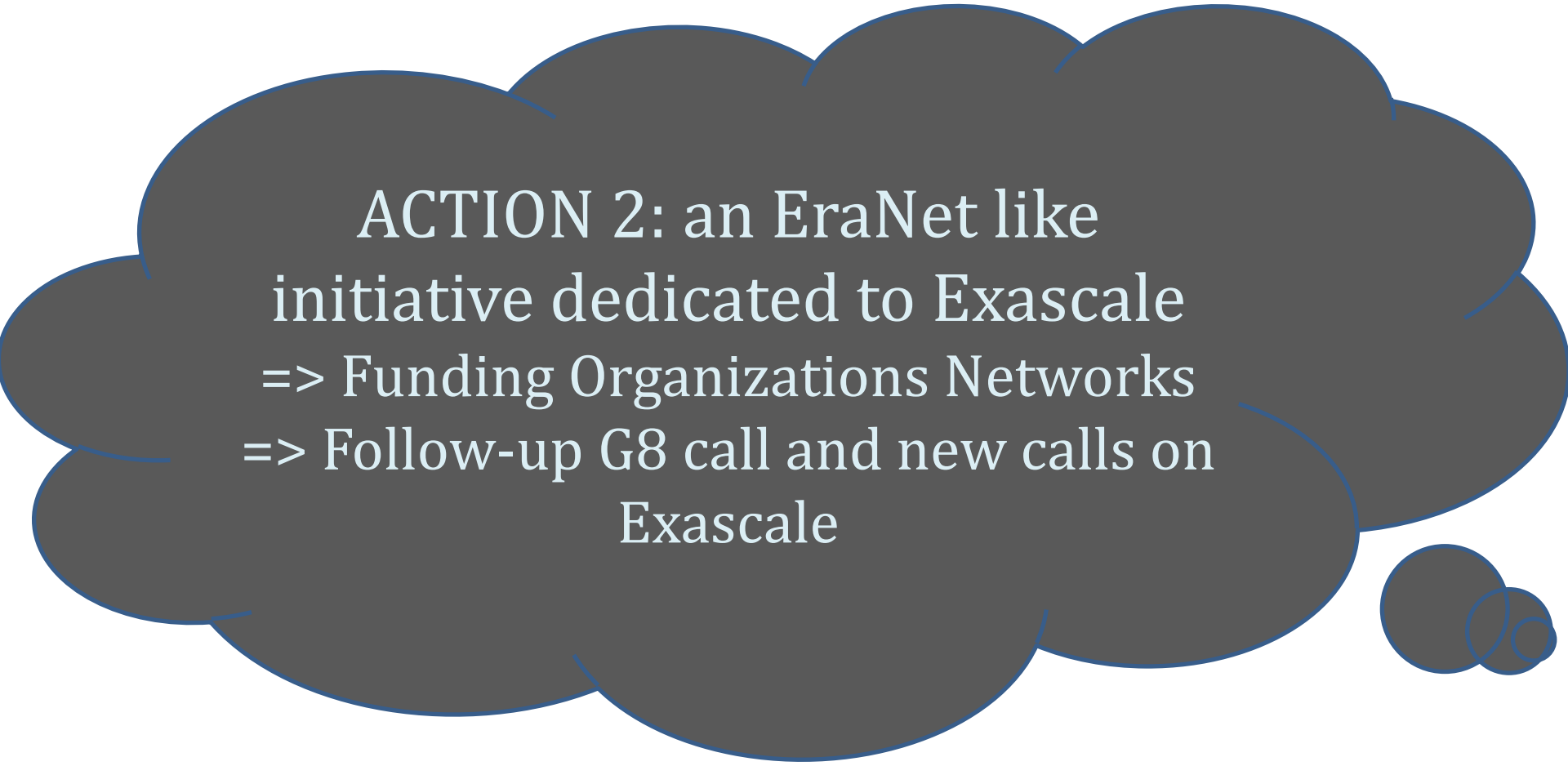
- Online questionnaire distributed through the PRACE network and to the National Research Funding Organizations financing ICT topics
- 16 full answers (not homogeneous in terms of content) received so far from Belgium, France, Germany, Italy, Netherlands, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, UK
- Main outcome (see details in annex):
  - Strong need for collaboration with Europe, Japan and US
  - Exascale plans in every major countries

But :

  - Lack of long term visibility (up to 2020)
  - Diversity of answers in nature
  - Lack of some important contributions

ACTION 1: ANR survey of funding programs and projects on Exascale

International collaboration, BDEC actions and funding agencies relations



Some historical context or how to take advantage of existing efforts

G8HORCS calls

- 2011 : *Interdisciplinary Program on Application Software towards Exascale Computing for Global Scale Issues*
- 2012 : *Interdisciplinary Programme on Material Efficiency – A First Step towards Sustainable Manufacturing*
- 2013 : *Interdisciplinary Programme on Coastal vulnerability & Fresh water security* – Belmont Forum (IGFA - International Group of Funding Agencies for Global Change Research)

Proposed in 2011 by EESI1 as a first G8 call

ACTION 2: an EraNet like initiative dedicated to Exascale
=> Funding Organizations Networks
=> Follow-up G8 call new calls on Exascale

An EraNet like initiative dedicated to Exascale

Some historical context or how to take advantage of existing efforts

- G8 Heads of Research Councils (HORCs) meeting in Kyoto, Japan, in May 2008: Proposal for a **multilateral funding activity**:
  - Multilateral research projects can address global challenges in ways that are beyond the capacity of national or bilateral activities.
  - The G8 HORCs framework provides the unique opportunity to pilot a new modality for conducting international research.
- Goals: supporting **excellent** and **interdisciplinary** research on topics of **global relevance** best tackled through a multinational approach.
- Research topics defined separately for each call.
- 7 Funding Agencies: NSERC (Canada), ANR (France), DFG (Germany), JSPS (Japan), RFBR (Russia), RCUK (UK), NSF (USA).
- Principles:
  - A common call text with selection criteria predefined together
  - A **multinational peer review** process in 2 stages (pre-proposals and full proposals)
  - Consortia consisting of partners from at least 3 of the participating countries.
  - **National funding** according to normal terms and conditions for national project funding.
  - Funding meant for **collaborative research**, not merely for networking, mobility or c

ACTION 2: an EraNet like initiative dedicated to Exascale
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Preparing HPC Codes and Software for Exascale Computing

Mid-term review of the G8 Exascale Projects, November 2012/SC12

1. Share the early results of these 6 projects and their impact on science : six projects on climate, earth system, seismic wave simulations, nuclear fusion simulations, dynamics of large biomolecular systems
2. Explore common lessons learned in terms of Exascale research
3. Present early feedback on this innovative multinational collaborative pilot program
4. Discuss between funding agencies, PIs and the Exascale community related to the G8 tool: call, award management, cooperation between partners, consortium management

www.agence-nationale-recherche.fr/Colloques/G8HORCs-workshop/inscription.php

Final projects review, June 12-13, 2014 at Princeton University, USA

ACTION 2: an EraNet like initiative dedicated to Exascale
=> Funding Organizations Networks
=> Follow-up G8 call new calls on Exascale

Final projects review, June 12-13, 2014 at Princeton University, Princeton, NJ, USA

- Worldwide Collaborations

A unique opportunity to enable collaborations between 3 to 6 different countries (4 projects with 5 or 6 countries):

- making improvement available in all these countries while usual international collaborations are bilateral or regional ones (EC, US, Asia),
- enabling international comparison of great value, leading to some of the most important recent advances in some of the scientific fields funded
- transforming the frontiers , fostering international collaboration, speeding-up the research
- enabling a mix of top world researchers to collaborate

- Education and training: involving an average 10 students / project, providing them a unique opportunity to collaborate and be trained by the best worldwide researchers in the field
- Enabling the access to top worldwide facilities, HPC computers and Big Data.
  - ECS : BLueWaters (NCSA), Intrepid (ANL), K computer (Riken), Tsubame2(Titech), Jugene (PRACE), Marenostrum2 (BSC)
  - NuFuse: BG-Q (DOE-SC's"Mira"@ALCF & NNSA's "Sequoia" at LLNL), K-Computer (Riken), Jugene (JSC); Titan (OLCF); TH 1-A and initial access to TH-2 (China).

ACTION 2: an EraNet like initiative dedicated to Exascale
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A follow-up call, "Interdisciplinary Program on Application Software towards Extreme Computing and Big Data for Global Scale Issues"

=> Failed because of geo-political concerns

A HOPE, the emergence of a "Funding Group on Collaborative Research e-infrastructures as an evolution of the RDA Colloquium. An Europe/US/Australia initiative

Feb. 2015. The objectives of the CRE Funding Group are to identify and pursue opportunities for ***coordinated funding of research e-infrastructure*** *activities in alignment with its mission and the research priorities of its members; to develop and implement a non-binding MOU framework that provides an agreed and consistent mechanism for such cooperative international funding of CREs; and to serve as a forum for discussion and advancement of related policy and practice issues and activities.*

Agenda: winter-Spring 2016. Release first pilot funding call(s) and initiate priority activities.

Funding Group on Collaborative Research e-infrastructures. Feb 2015

- The CRE Funding Group is focused on enabling the development of collaborative research e-infrastructures that respond to identified collaborative needs of the research community across national boundaries within and across scientific domains.
- The Group emphasizes multilateralism over bilateralism to promote international cooperation, global community building, convergence and synergy on collaborative research cyberinfrastructures.
- Membership in the Group shall be open to all [funding agencies] interested in investing in the development of transnational CREs and adhering to the Group's principles.
- The Group will seek to complement and cooperate as appropriate with related globally-focused activities from other transnational research e-infrastructure funding groups such as The Belmont Forum E-Infrastructures and Data Management Collaborative Research Action, and with the Group of Senior Officials (GSO) focused on Global Research Infrastructures.
- The Group will serve as a forum for discussing and exploring solutions to practical issues that may arise in connection with its efforts to enable cooperative international funding of CREs. These discussions will be useful to inform the development of policy and legal frameworks.

Networks
=> Follow-up G8 call new calls on Exascale

Joint DFG/ANR/JSPS call

- Strategic initiative to fund HPC software in Germany
  - Establish collaborative, interdisciplinary co-design of HPC applications and HPC methods
  - Consists of research consortia with central, network-wide coordination
- SPPEXA research is driven by domain science / CSE application, powered by scientific computing / CSE methodology
- 6 topics: Computational algorithms, System software, Software tools, Application software, Programming, Data management

ACTION 2: an EraNet like initiative dedicated to Exascale
=> Funding Organizations Networks
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Future plan: joint DFG/ANR/JST call

Phase 1: 2011 DFG call

Cover > 15 disciplines, close collaboration within and among SPPEXA consortia, overall budget of 3.7m € per year

Phase 2: 2014 DFG/ANR/JST call, budget 15,7M€

Competition Phase	
Publication of call for proposals	**30 September 2014**
Outreach on SC14 Conference	16 -21 November 2014
Deadline for the suggestion of potential PoE members	16 November 2014
Setup of PoE (Audio conference and/or meeting @ SC14)	16 - 30 November 2014
Deadline for submission of project proposals	**31 January 2015**
Checked eligibility of the proposals	Mid February 2015
Assignment of proposals to panel members	Mid February 2015
Proposals sent to reviewers	28 February 2015
Proposal review meeting	Late April 2015
Official funding decisions taken and notifications of applicants	**October 2015**
Project Phase	
Begin of projects	**January 2016**
Presentation of results within (dedicated?) international conference (e.g. at SC 18)	November 2018
End of projects	**December 2018**

	Number of eligible proposals
Unilateral projects (DFG)	10
Bilateral projects (DFG, JST)	5
Trilateral projects (DFG, JST, ANR)	5
Total	20

ACTION 2: an EraNet like initiative dedicated to Exascale
=> Funding Organizations Networks
=> Follow-up G8 call new calls on Exascale

International collaboration, BDEC actions and funding agencies relations

ACTION 3:
US – Japan – Europe BDEC series of workshops

Europe-USA-Japan International series of Workshops on Extreme Scale Scientific Computing

Following the International Exascale Software Initiative (IESP 2008-2012 => **Big Data and Extreme Computing** workshops series(BDEC)

www.exascale.org/bdec/sites/www.exascale.org.bdec

Overarching goal:

1. Create an international collaborative process focused on the co-design of software infrastructure for extreme scale science, addressing the challenges of both extreme scale computing and big data, and supporting a broad spectrum of major research domains,
2. Describe funding structures and strategies of public bodies with Exascale R&D goals worldwide
3. Establishing and maintaining a global network of expertise and funding bodies in the area of Exascale computing

1 - BDEC Workshop, Charleston, SC, USA, April 29-May1, 2013

2 – BDEC Workshop, Fukuoka, Japan, February 26-28, 2014

3 – BDEC Workshop, Barcelona, Spain, January , 2015

EESI deliverables: European representation in the BDEC steering committee => local organisation, workshop agenda, attendees, report

US – Japan – Europe BDEC series of workshops

Europe-USA-Japan Big Data and Extreme Computing series of workshops (BDEC)

1 - BDEC Workshop, Charleston, SC, USA, April 29-May 1, 2013

Draft BDEC Agenda 3/28/2013

Monday, April 29th	On your own arrive at Charleston, South Carolina
6:00 – 7:00 pm	Reception with drinks and light hors d'oeuvres at the hotel. Dinner is on your own.
Tuesday, April 30th	
8:00 – 9:00 am	Breakfast
8:30 - 9:00 am	Registration
9:00– 9:10 am	Welcome to Big Data and Extreme Computing: Goals and Overview Pete Beckman, Jean-Yves Berthou, Jack Dongarra, Yutaka Ishikawa, Satoshi Matsuoka, Philippe Ricoux
9:10 – 9:30 am	Talk 1 Alok Choudhary Northwestern University
9:30 – 9:50 am	Talk 2 Tim Cornwell Square Kilometre Array
9:50 – 10:10 am	Talk 3 Alex Szalay Johns Hopkins University
10:10 – 10:40 am	**Break**
10:40 – 11:00 am	Talk 4 Rick Stevens Argonne National Laboratory
11:00 – 11:20 am	Talk 5 Shinichi Morishita University of Tokyo
11:20 – 11:40 am	Talk 6 Bill Gropp University of Illinois
11:40 – 1:00 pm	**Lunch**
1:00 – 2:30 pm	Panel on ? Osamu Tatebe, Pier Luigi Vidale, Jean-Michel Alimi, Wolfgang Nagel DFG
2:30 – 3:00 pm	**Break**
3:00 – 5:00 pm	Breakout Groups Track 1 – International Collaboration, Frameworks, Funding, and Co-design: • Dan Reed, Jean-Yves Berthou Track 2 - Architecture: • Rick Stevens, Satoshi Matsuoka Track 3 - Software: • Vivek Sarkar, Bill Kramer, Wolfgang Nagel
5:00 – 5:30 pm	Reports from breakout groups
Dinner 6:00 pm	**Banquet at Hotel**
Wednesday, May 1st	
8:00 – 9:00 am	Breakfast at ?
9:00– 9:10 am	
9:00 – 9:20 am	Talk 7 Joel Saltz Emory University
9:20 – 9:40 am	Talk 8 Arie Shoshani
	Lawrence Berkeley National Laboratory *On the Role of Indexing for Big Data in Scientific Domains*
9:40 – 10:00 am	Talk 9 Jean-Pierre Villotte IPGP
10:00 – 10:30 am	**Break**
10:30 – 10:50 am	Talk 10 Bill Kramer University of Illinois
10:50 – 11:10 am	Talk 11 Vivek Sarkar Rice University
11:10 – 11:30 am	Talk 12 Miyoshi Takemasa RIKEN AICS
11:30 – 12:30 pm	**Lunch**
12:30 – 2:00 pm	Panel on ? Reagan Moore,
2:00 – 2:30 pm	**Break**
2:30 – 4:30 pm	Breakout Groups Track 1 – Interoperability: • Dan Reed, Jean-Yves Berthou Track 2 - Workflows: • Rick Stevens, Satoshi Matsuoka Track 3 - Taxonomy: • Vivek Sarkar, Bill Kramer, Wolfgang Nagel
4:30 – 5:00 pm	Reports from breakout groups Discussion on Follow on Workshops
	Dinner on your own

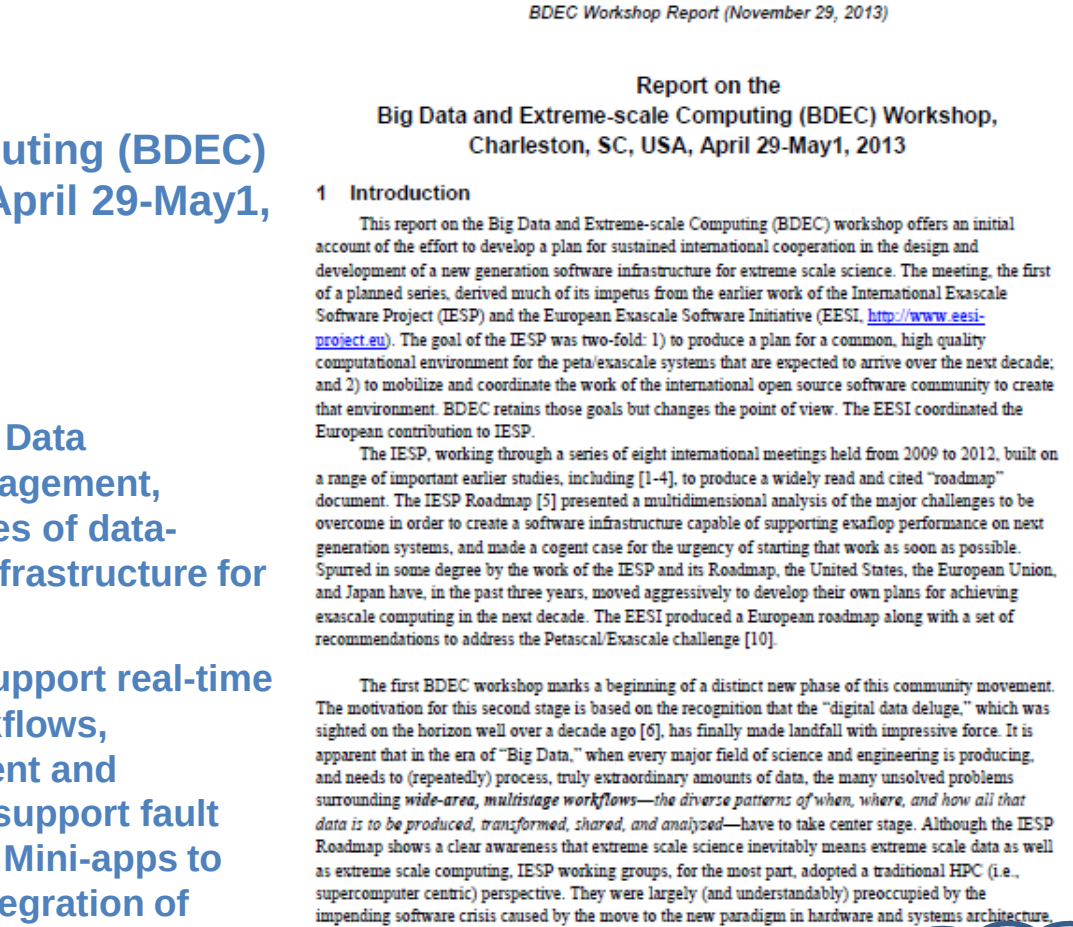
US – Japan – Europe BDEC series of workshops

Europe-USA-Japan Big Data and Extreme Computing series of workshops (BDEC)

1 - BDEC Workshop, Charleston, SC, USA, April 29-May 1, 2013

Big Data and Extreme-scale Computing (BDEC) Workshop, Charleston, SC, USA, April 29-May1, 2013

- **Workflow Issues**
- **Architecture Challenges**
- **Higher Level Data Challenges : Data provenance, Policy based data management, Environments that support new types of data-driven research, Shared software infrastructure for intermediate processing**
- **Software Challenges: Tools to support real-time monitoring and observation of workflows, Coordination between data movement and compute services, Mechanisms to support fault tolerant workflows in data analysis, Mini-apps to support infrastructure codesign, Integration of widely used BD-capable data libraries into standard packages, Common tools for managing and exploring data, Interoperability Challenges**



BDEC Workshop Report (November 29, 2013)

Report on the
Big Data and Extreme-scale Computing (BDEC) Workshop, Charleston, SC, USA, April 29-May1, 2013

1 Introduction

This report on the Big Data and Extreme-scale Computing (BDEC) workshop offers an initial account of the effort to develop a plan for sustained international cooperation in the design and development of a new generation software infrastructure for extreme scale science. The meeting, the first of a planned series, derived much of its impetus from the earlier work of the International Exascale Software Project (IESP) and the European Exascale Software Initiative (EESI, http://www.eesi-project.eu). The goal of the IESP was two-fold: 1) to produce a plan for a common, high quality computational environment for the peta/exascale systems that are expected to arrive over the next decade; and 2) to mobilize and coordinate the work of the international open source software community to create that environment. BDEC retains those goals but changes the point of view. The EESI coordinated the European contribution to IESP.

The IESP, working through a series of eight international meetings held from 2009 to 2012, built on a range of important earlier studies, including [1-4], to produce a widely read and cited "roadmap" document. The IESP Roadmap [5] presented a multidimensional analysis of the major challenges to be overcome in order to create a software infrastructure capable of supporting exaflop performance on next generation systems, and made a cogent case for the urgency of starting that work as soon as possible. Spurred in some degree by the work of the IESP and its Roadmap, the United States, the European Union, and Japan have, in the past three years, moved aggressively to develop their own plans for achieving exascale computing in the next decade. The EESI produced a European roadmap along with a set of recommendations to address the Petascal/Exascale challenge [10].

The first BDEC workshop marks a beginning of a distinct new phase of this community movement. The motivation for this second stage is based on the recognition that the "digital data deluge," which was sighted on the horizon well over a decade ago [6], has finally made landfall with impressive force. It is apparent that in the era of "Big Data," when every major field of science and engineering is producing, and needs to (repeatedly) process, truly extraordinary amounts of data, the many unsolved problems surrounding ***wide-area, multistage workflows—the diverse patterns of when, where, and how all that data is to be produced, transformed, shared, and analyzed***—have to take center stage. Although the IESP Roadmap shows a clear awareness that extreme scale science inevitably means extreme scale data as well as extreme scale computing, IESP working groups, for the most part, adopted a traditional HPC (i.e., supercomputer centric) perspective. They were largely (and understandably) preoccupied by the impending software crisis caused by the move to the new paradigm in hardware and systems architecture, a paradigm that demands orders of magnitude more parallelism, places unpr… energy consumption, and requires resilience to faults occurring at far hi… Data-driven workflow issues received some collateral discussion in th… attention for the IESP was on the revolutionary innovations in the … to address the steep challenges of emerging peta/exascale sy…

US – Japan – Europe BDEC series of workshops

Europe-USA-Japan Big Data and Extreme Computing series of workshops (BDEC)

2 – BDEC Workshop, Fukuoka, Japan, February 26*-28, 2014

Draft BDEC Agenda: February 14, 2014

Wednesday, February 26th	On your own arrival at Fukuoko Japan
6:00 – 7:00 pm	Reception with drinks and light hors d'oeuvres at the hotel. Dinner is on your own. Hotel Monterey La Soeur – Fukuoka (Salon Nouveau – 2nd floor) Registration during the reception
Thursday, February 27th	
8:30 am	Bus from Hotel to meeting site (Centennial Hall Kyushu University School of Medicine)
9:00 am	Registration
9:15 – 9:30 am	Welcome to Big Data and Extreme Computing. Goals and Overview Pete Beckman, Jean-Yves Berthou, Jack Dongarra, Yutaka Ishikawa, Satoshi Matsuoka, Philippe Ricoux
9:30 – 9:45 am	MEXT talk
9:45 – 10:20 am	Invited talk from Japan (Kitsuregawa)
10:20 – 10:30 am	**Break**
10:30 – 11:10 am	US overview talk (DOE, B. Harrod & NSF, I. Qualters)
11:10 – 11:25 am	EU and international future calls (EC, G8, DFG) (JY Berthou/ M Wilms)
11:25 – 11:55 am	EU overview talks PRACE, ETP4HPC, EESI (S. Girona/JF Lavignon/P. Ricoux)
11:55 – 12:25 pm	China overview talk
12:25 – 1:05 pm	Japan overview talk (report on Feasibility Studies)
1:05 – 1:45 pm	**Lunch Break**
1:45 – 2:30 pm	BDEC 1 and a Strawman Architecture for a Data Facility (P. Beckman)
2:30 – 4:00 pm	6 - 6 minute talks based on whitepapers + time for panel discussion and Q&A
	• Extreme Data Science o Sudip Dosanjh, Shane Canon, Jack DeSlippe, Kjiersten Fagnan, Richard Gerber, Lisa Gerhardt, Jason Hick, Douglas Jacobsen, David Skinner, and Nicholas J. Wright • Path Forward for Big Data and Extreme Computing o Chaitan Baru, Michael Norman • The Human Brain Project (It is really a data integration and analytics problem – not a data generation problem…) o Thomas Lippert, Boris Orth, Bernd Mohr • The Need for Resilience Research in Workflows of Big Compute and Big Data Scientific Applications o Franck Cappello and Tom Peterka • Holistic View of Composable Data Analysis: Insights From Software Frameworks for Extreme Scale Computing o Dubey, W. Bethel, Prabhat, J. Shalf, A. Shoshani, B. Van Straalen • From Large Simulations to Interactive Numerical Laboratories o Alexander S. Szalay
4:00 – 4:15 pm	**Break**
4:15 – 5:30 pm	6 – 6 minute talks based on whitepapers + time for panel discussion and Q&A
	• Virtual Observatories: A Facility for Online Data Analysis o Kate Keahey • High Performance High Functionality Big Data Software Stack o Geoffrey Fox, Judy Qiu, Shantenu Jha • The Role of Mini-apps in Weather and Climate Models Performance Optimization o Giovanni Aloisio, Jean-Claude André, Italo Epicoco, Silvia Mocavero • High-Performance Software Stacks for Extremely Large-Scale Graph Analysis System o Katsuki Fujisawa, Toyotaro Suzumura, Hitoshi Sato, Toshio Endo • On Next Generation Big Data Analytics Systems o Volker Markl • Science Automation using Workflows in the Big Data and Extreme Scale Computing Era o Ewa Deelman
5:30 pm	**Evening Reception (bus from the meeting site to hotel to break site)**
Friday, February 28th	
8:30 am	Bus from Hotel to meeting site (Centennial Hall Kyushu University School of Medicine)
9:00 – 10:45 am	7 - 6 minute talks based on whitepapers + time for panel discussion and Q&A
	• Increasing Scientific Data Insights About Exascale Class Simulations Under Power and Storage Constraints o James Ahrens • Energy Aware Big Data Management and Processing o Jean-Francois Lavignon • Impact of Huge Bandwidth Optical Interconnection Network and a New Memory Paradigm with Global Address Space for BDEC Systems o Tomohiro Kudoh, Shu Namiki, Ryousei Takano, Kiyo Ishii, Yoshio Tanaka, Isao Kojima, Tsutomu Ikegami, Satoshi Itoh, Satoshi Sekiguchi • Strategic Collaboration Between HPC and Cloud to Address Big Data in Global Scientific Challenges o Maryline Lengert, Bob Jones, David Foster, Steven Newhouse • Towards Extreme-scale Graph Processing with Deepening Memory Hierarchy o Hitoshi Sato • BSC Vision on Big Data and Extreme Scale Computing o Jesus Labarta, Eduard Ayguade, Fabrizio Gagliardi, Rosa M. Badia, Toni Cortes, Jordi Torres, Adrian Cristal, Osman Unsal, David Carrera, Yolanda Becerra, Enric Tejedor and Mateo Valero • SACLA and the K Computer o Hori
10:45 – 11:00 am	**Break**
11:00 – 12:30 pm	Three Breakout Sessions
12:30 – 1:00 pm	Report on the Breakouts
1:00 – 1:30	**Lunch Break**
1:30 – 3:30 pm	Three Breakout Sessions
3:30 – 4:00 pm	**Break**
4:00 – 5:00 pm	Report on Breakouts
5:00 – 5:30 pm	Future Planning
	Dinner on your own

Focus: An international workshop on the post-Peta path forward to extreme scale scientific computing, taking into account the full range of complicated issues that the community confronts in the era of **Big Data**.

* : Japanese pre-BDEC workshop, US and Europe invited

US – Japan – Europe BDEC series of workshops

Europe-USA-Japan Big Data and Extreme Computing series of workshops (BDEC)

3 – BDEC Workshop, Barcelona, Spain, January 28-30, 2015

Focus: how major issues associated with Big Data potentially change the national and international plans that are now being laid for achieving exascale computing.

Discussion topics :

- Full data life cycle in the context of Exascale
- In-situ data analysis and visualization
- Data management and provenance
- Mining and curation of the multi-Petabyte heterogeneous data sets generated by experiments and simulations
- Extreme-computing algorithms for data analysis
- Performance analysis and productivity tools
- Validation of computer models and models' uncertainties
- Energy-efficient computing,
- New data architectures compatible with HPC
- Machine learning, and data analytics
- How will HPC centers change to support big data?
- Are the cross cutting issues different here than for Exascale (Concurrency, Energy, Resiliency, Heterogeneity, I/O and Memory)?

US – Japan – Europe BDEC series of workshops

Europe-USA-Japan Big Data and Extreme Computing series of workshops (BDEC)

3 – BDEC Workshop, Barcelona, Spain, January 28-30, 2015

Attendees: >100 people, 40% Europe&Russia, 30% Asia (Japan, China, Singapore, Korea), 30%US

January 28 : BDEC for Europe meeting, specific focus on European strategy, research agenda, projects and initiatives.

=>www.eesi-project.eu/pages/menu/bdec.php

January 29-30 : BDEC meeting,
www.exascale.org/bdec/agenda/barcelona

=> white papers&presentations, breakout sessions

Report to be finalized

US – Japan – Europe BDEC series of workshops

International Collaboration, Funding Agencies

ACTION 1: ANR survey of funding programs and projects on Exascale

ACTION 2: an EraNet lik initiative dedicated to Exascale

=> Funding Organizations Network

=> Follow-up G8 call and new calls o Exascale

THANK YOU

ACTION 3: US – Japan – Europe BDEC series of workshops