EXDCI – European eXtreme Data and Computing Initiative

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EXDCI Coordinator

EXDCI @ ORAP

March, 17 2016

Objectives

- **Coordinate** the development and implementation of a common strategy for the European HPC Ecosystem
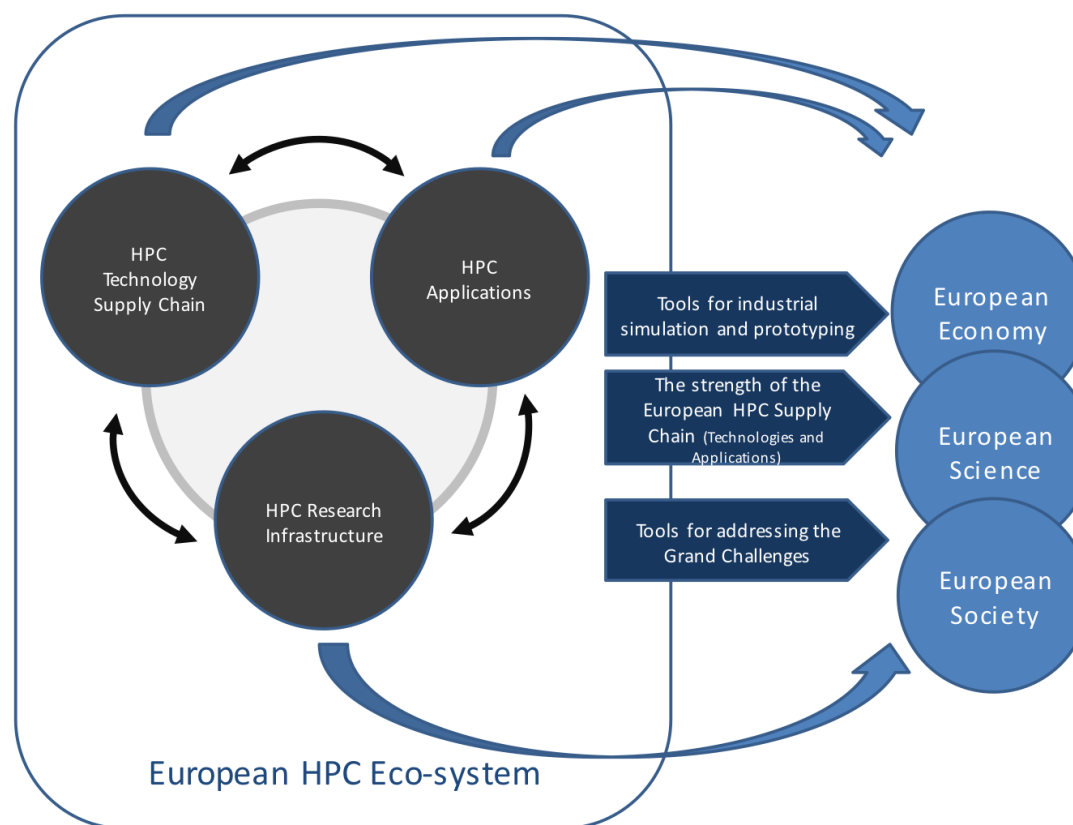
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Structure

WP 1: Management

WP 2: Technological ecosystem and roadmap toward extreme and pervasive data and computing

WP 3: Applications roadmap toward Exascale

WP 4: Transversal vision and strategic prospective

WP 5: Talent generation and training for the future

WP 6: International liaison

WP 7: Impact monitoring – methods and tools

WP 8: Dissemination

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Organisation
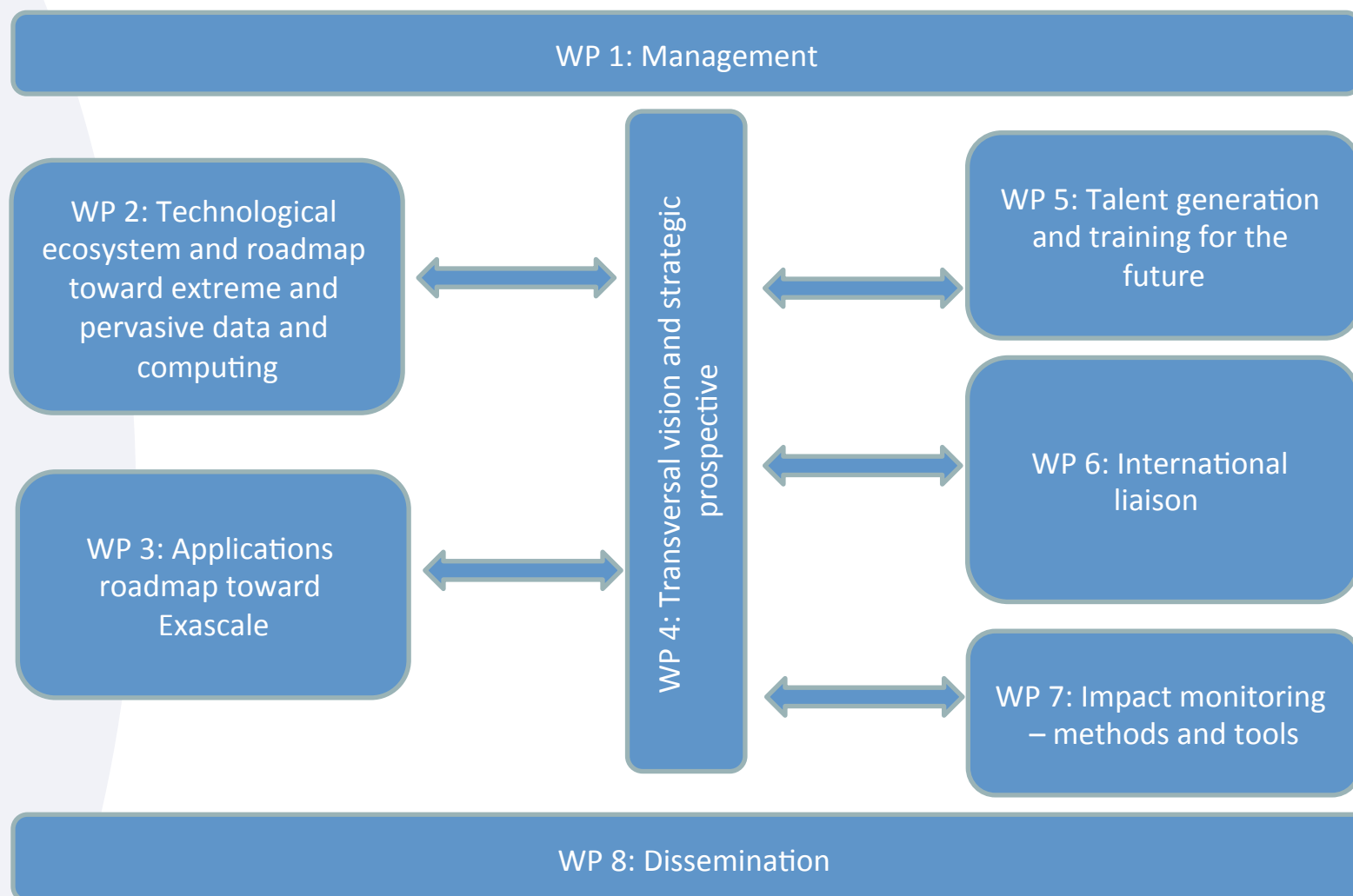
- Project Kick-off organised in Brussels, September 2015

- EXDCI Management Board and Technical Board

- Project Management Office established in Brussels

- Collaborative internal workspace

- Quality Assurance Process for the projects deliverables

- Templates for deliverables and reports

Technological ecosystem and roadmap toward extreme and pervasive data and computing
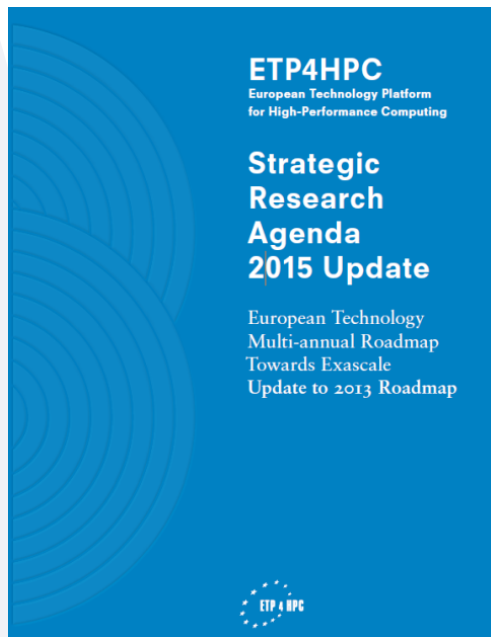
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Google "Public Call for comments on SRA "

We welcome your comments on the current SRA
http://www.etp4hpc.eu/strategic-research-agenda/

Next SRA-related events in H1 2016

- Extreme-Scale Demonstrators Workshop @ HPC summit/May 12th
  - focussed on the EsD definition (engage potential players, further implementation details)
  - at this event the three pillars for the EsD mission (CoE, HPC centres and the FETHPC1 project speakers) are invited

- ISC16 – June 23rd
  - Scope: Feedback session on SRA directions, content and value to shape the next update
  - Invited are:
    - End-users, ISVs
    - International HPC experts
    - Members from SRA workgroups

- Level set with HPC application experts (EXDCI Technical meeting) – September 21&22
- Technical workshop with Big Data Value Association (BDVA) May/ June

Applications roadmap towards Exascale

Applications roadmap towards Exascale: Goal

- ## Objectives
  - Provide updated roadmaps of needs and expectations of scientific applications
  - Provide inputs to the update the PRACE Scientific Case in order to support PRACE in the deployment of its (Pre)Exascale pan European HPC research infrastructure

- ## Initiative to create an update of the Scientific Case and capture the current and expected future needs of the scientific communities
  - Weather, Climatology and solid Earth Sciences
  - Astrophysics, HEP and Plasma Physics
  - Materials Science, Chemistry and Nanoscience
  - Life Sciences and Medicine
  - Engineering Sciences and Industrial Applications

THE SCIENTIFIC CASE FOR HIGH PERFORMANCE COMPUTING IN EUROPE 2012 - 2020

FROM PETASCALE TO EXASCALE

PRACE

- PRACE Scientific Case

- Issued end of 2012 by the PRACE Scientific Steering Committee

- Needs and roadmaps from different scientific and industrial communities

- Key recommendations :

  - Persistent Pan EU HPC infrastructure;

  - Development of algorithms and system tools;

  - Integrated compute & data;

  - Education & Training;

  - Thematic centers (aka CoE)...

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The EESI2 reports and recommendations

- Issued mid 2014 and mid 2015

- 5 Applications working groups

- 43 experts from 10 countries, academia & industry

- 3 specific reports on applications published

- Active participation on EESI2 global recommendations includes:
  - Parallelisation in Time with examples on applications
  - Uncertainty Quantification in massively parallel codes
  - In-situ Data Processing in Extreme Simulations
  - Efficient Couplers for Extreme Computing
  - Data Centric Approach in turbulent flows

Applications roadmap towards Exascale:
Structure in a nutshell

European HPC
Summit Week
9 - 12 May 2016
Prague

- Organisation

  - 4 working groups of around 30+ experts

    - Industrial and engineering applications

      (EDF : Yvan Fournier, University of Aachen : Heinz PITSCH)

    - Weather, Climatology and Solid Earth Sciences

      (Univ. Salento/CMCC : Giovanni ALOISIO, JCA Consultance: Jean-Claude Andre)

    - Fundamental Sciences

      (CEA : A. Sacha BRUN, JSC: Stefan KRIEG)

    - Life Science & Health

      (BioExcel CoE/ KTH : R. Apostolov)

  - Coordination, consolidation of application roadmaps and inputs to the update of the PRACE Scientific Case

- Outcome and deliverables

  - First set of reports and recommendations toward applications (November 2016)

  - Third version of the PRACE SSC Scientific Case – a full bottom-up new version of PRACE SSC Scientific Case, following the last one published in 2012 (November 2017)

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Transversal vision and strategic prospective

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Transversal vision and strategic prospective: Targets

- Objectives
  - Building a global vision of the roadmaps, towards a shared European e-infrastructure roadmap (with DG-CNECT, DG-RTD, ESFRI, e-IRG)
  - Identifying synergies to lead to a co-design approach
- Ecosystem transversal relationships
  - Centres of Excellence, FET HPC Projects, Eurolab4HPC
- SME
  - Support Start-Ups and SMEs and see how to accelerate the creation of new start-ups that could potentially be created due to the technological progress achieved within the Horizon 2020 FETHPC Program.
  - Interest for identification of start-ups creation opportunities in the scope of the CoEs and the FET HPC projects
  - Needs of SMEs participating in CoEs and FET HPC projects
- Survey recommendations continuity (e.g. from EESI)

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Transversal vision and strategic prospective: Actions

- Status

  - Coordination for establishing "questionnaire" common to ETP4HPC and PRACE to collect ecosystem progresses (available at https://exdci.eu/questionnaire-coe-fet-hpc)

  - Coordination with EuroLab4HPC

  - Participating to the exchanges events: ISC 2016 Bof, European HPC Summit Week, Big Data and Extreme Scale Computing (BDEC) workshops

  - Identification of potential technological disruptions

- Next steps

  - SME actions discussion at the European HPC Summit week

  - Building a first set of recommendations based on the ecosystem inputs

Talent generation and training for the future

European HPC
Summit Week
9 - 12 May 2016
Prague

- Addressing the shortage of HPC skills in academia and industry, by:

    - Promoting HPC and HPC skills to young people as exciting and rewarding areas for study and employment;

    - Supporting employers in job specification and recruitment of staff with appropriate HPC skills;

    - Undertaking training gap analysis across the whole HPC Ecosystem, with a view to producing a synthesised training roadmap for Europe;

    - Supporting the development of a community of HPC training providers.

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- Supporting Talent Generation

  - To promote the importance of HPC skills to young people.

  - Creating material to present at eg local science festivals, university visits, etc:

    - To present HPC in a gender-neutral way, to try to improve the gender balance within the HPC community;

    - To highlight the many and varied jobs that exist, both in HPC community and professions combining modelling skills with domain expertise, eg engineering, climate modelling.

  - Initial set of 5 HPC career case studies produced; more to follow

    - http://www.exdci.eu/CaseStudies/

Talent and training: Tasks

- Facilitating HPC Staff Recruitment

    - "Job Centre" portal to be set up, providing:

        - Sample job descriptions (to help employers specify the skills they need);

        - Links to sites where HPC jobs are listed;

        - Details of jobs offered by PRACE, ETP4HPC and EESI partners, specifically promoting opportunities in Europe.

- Identifying and Meeting Future Training Needs

    - A searchable portal of training courses and providers will be created.

    - A Synthesised Training Roadmap will be produced, based on Gap Analysis and future requirements.

    - A community of training providers will be established, to coordinate European efforts in HPC training and education.

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International liaison

World-wide presence

- Objectives

  - Mapping and analysis of national and international R&I programs/activities/research agendas in HPC towards exascale, and convergence of Exascale with Exabyte (big compute and big data).

  - Coordination with and participation in relevant international activities.

  - Establish and maintain a global network of expertise and funding bodies in the area of Exascale computing.

  - Act as a proactive European voice and representative in the International Exascale Software Community and BDEC initiative.

- Coordination with

  - SPPEXA (Germany-France-Japan).

  - Belmont Forum CRA on e-infrastructures and data (14 countries).

  - Coordinated Research on E-infrastructures (CRE) (DG-CNECT, RDA).

  - BDEC (EU-USA-Japan)

- Opportunities:
  - Analysing the activities of the European projects (mainly the ones from the FET HPC 1 call) and other HPC Ecosystems actions with an objective to identify the areas of:
    - (1) technology provision,
    - (2) infrastructure and
    - (3) application resources that can benefit from international collaboration.
- Federating the international contacts to prevent each project from having to develop its own network.
- Identifying tools suitable for fostering such relationships

Impact monitoring – Methods and tools

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Impact monitoring

- Create the necessary analysis tools to support informed decision-making in relation to:
  - the development of the European HPC Ecosystem
  - the impact of the Research &Innovation activities linked to the HPC cPPP strategy
- It is of upmost importance to measure and show the effectiveness of H2020 HPC programmes and to involve all stakeholders in this effort – especially for the collection of some data which is needed for proper monitoring.
- ETP4HPC and PRACE are joining forces in this effort, building on previous work
  - PRACE KPIs have been defined and implemented, and are regularly updated
  - ETP4HPC and the EC set-up a set of KPIs to be monitored within the HPC cPPP
  - Use of surveys and direct interaction with FETHPC projects, CoEs, ETP4HPC members to collect data and consolidate methodology
  - See https://exdci.eu/activities/kpi

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Overview of cPPP Performance Indicators

- A. Indicators for Industrial Competitiveness and Socio-Economy Impact

  - • KPI 1: Global market share of European HPC

  - • KPI 2: HPC additional investments

  - • KPI 3: Jobs

  - • KPI 4: Innovation Environment in HPC

- B. Indicators for the operational aspects of the programme

  - • KPI 5: Research programme effectiveness and coverage

  - • KPI 6: Performance of HPC technologies developed

  - • KPI 7: People, education, training and skills development

  - • KPI 8: HPC use

  - • KPI 9: HPC Software ecosystem

  - • KPI 10: Patent, inventions and contributions to standards in HPC by H2020 funded projects

- C. Indicators for management aspects of the programme

  - • KPI 11: Efficiency, openness and transparency of the PPP Consultation Process

  - • KPI 12: Dissemination and Awareness

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Dissemination

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European HPC
Summit Week
9 - 12 May 2016
Prague

Event	Date	Location
EXDCI workshop	Rome, Italy	29-30 September 2015
European HPC Summit Week: EXDCI workshop	Prague, Czech Republic	9 -12 May 2016
ISC'16: shared booth with European Exascale Projects	Frankfurt, Germany	19-23 June 2016
SC16: shared booth with PRACE booth	Salt Lake City, USA	13-18 November 2016
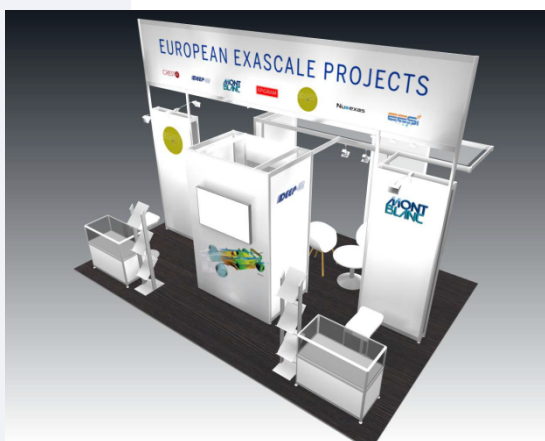
European HPC Summit Week

EXDCI Workshop ➤ Monday 9 to Tuesday 10

PRACEdays16 ➤ Tuesday 10 to Thursday 12

ETP4HPC Extreme-Scale Demonstrators Workshop ➤ Thursday 12

from 9 to 12 May 2016

Prague Czech Republic

European HPC Summit Week
9 - 12 May 2016
Prague

European HPC Summit week: EXDCI Workshop

Orea Hotel Pyramida - Bělohorská 24, 169 00 Praha 6, Czech Republic

www.exdci.eu

Monday, May 9, 2016

Location: **Congress Hall 1**

13:00 - 14:00	Registration	
14:00 - 14:10	Welcome and EXDCI objectives	Sergi Girona
14:10 - 14:25	EC presentation	A. Varghese & D. Axiotis
14:25 - 14:40	Highlights on training, SC and ISC participation	François Bodin
14:40 - 15:10	Strategic Research Agenda updated	Michael Malms
14:40 - 15:10	Scientific case: schedule, preparation and contributions	Stephane Requena
14:25 - 14:40	International cooperation: BDECs and additional cooperations	Mark Asch
14:40 - 15:10	EuroLAB4HPC	Per Stenström

Coffee break at the foyer

16:20 - 16:40	COEGSS	Bastian Koller
16:40 - 17:00	EoCoE	Edouard Audit
17:00 - 17:20	E-CAM	---
17:20 - 17:40	ESiWACE	Joachim Biercamp
17:40 - 18:00	MAX	---
18:00 - 18:20	NOMAD	---
18:20 - 18:40	PoP	---
18:40 - 19:00	BioExcel	E. Laure & R. Apostolov
19:00 - 19:20	End of day	---

Standing Cocktail/Dinner at the foyer

Tuesday, May 10, 2016

Parallel Session 1 at **Congress Hall 1**

8:30 - 8:35	Introduction	---
8:35 - 8:50	Epigram	E. Laure & R. Apostolov
8:50 - 9:05	CRESTA	Mark Parsons
9:05 - 9:20	EXA2CT	Tom Vander Aa
9:20 - 9:35	Numexas	---
9:35 - 9:50	ALLScale	Thomas Fahringer
9:50 - 10:05	ANTAREX	---
10:05 - 10:20	ESCAPE	Peter Bauer
10:20 - 10:35	INTERTWINE	Mark Bull
10:35 - 10:50	READEX	---

Parallel Session 2 at **Congress Hall 2**

8:30 - 8:35	Introduction	---
8:35 - 8:50	MontBlanc1/2	E. Walter & F. Mantovani
8:50 - 9:05	Mont-Blanc 3	E. Walter & F. Mantovani
9:05 - 9:20	DEEP	Estela Suárez
9:20 - 9:35	DEEPER	Estela Suárez
9:35 - 9:50	ECOSCALE	Iakovos Mavroidis
9:50 - 10:05	ExaNeSt	Manolis G.H. Katevenis
10:05 - 10:20	ExaNoDe	---
10:20 - 10:35	EXTRA	Dirk Stroobandt
10:35 - 10:50	greenFLASH	---

Coffee break at the foyer

11:10 - 11:25	ComPat	---
11:25 - 11:40	ExaFLOW	E. Laure & R. Apostolov
11:40 - 11:55	ExaHyPE	---
11:55 - 12:10	ExCAPE	Tom Ashby
12:10 - 12:25	NLAFET	---
12:25 - 12:45	Joint discussion	---

11:10 - 11:25	MANGO	José Flich
11:25 - 11:40	NEXTGenIO	---
11:40 - 11:55	SAGE	Sai Narasimhamurthy
11:55 - 12:15	Joint discussion	---

Joint Session at **Congress Hall 1**

12:45 - 12:50	Joint session	---
12:50 - 13:00	Summary of parallel session 1	François Bodin
13:00 - 13:10	Summary of parallel session 2	Thierry Bidot
13:10 - 13:20	EC presententation, outcome of the meeting	Panagiotis Tsarchopoulos
13:10 - 13:20	Closing EXDCI workshop	Jean-François Lavignon

Thank you for your attention

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