



ETP 4 HPC

**THE EUROPEAN TECHNOLOGY PLATFORM
FOR HIGH PERFORMANCE COMPUTING**

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ETP4HPC

Extreme Scale Workshop

HPC Summit Prague, May 12th 2016



Agenda

- 9:00 Welcome (SRA Editorial team)
- 9:10 EsDs - main directions and assumptions (Thomas Eickermann and Marc Duranton)
- 9:30 EsD concept – the view of the EC (Dr. Panagiotis Tsarchopoulos)
- 9:40 Project/Organisation Presentations – Part 1
- 10:40 Coffee Break
- 11:00 Project/Organisation Presentations – Part 2
- 12:30 Lunch
- 13:15 Interactive session (2 x 40min min discussion sessions per “table”):
 - Technical total system target characteristics (facilitator: Marc Duranton)
 - Required ESD project budget assumptions (facilitator: Hans Christian Hoppe)
 - Procurement model options (facilitator: Dirk Pleiter)
 - Composition of consortia - roles and tasks, e.g. of SMEs and appl. Owners (facilitator: Thomas Eickermann)
 - Use Cases Enabled by EsDs (facilitator: Erwin Laure)
- 15:00 Result of the interactive sessions
- 1550 Next steps
- 16:00 End

Flow of interactive session

- 5 “focus tables” with 2 x 40 min discussion sessions :
 - Each participant can take part in two different discussion in the 1st and 2nd round
 - Participants have put their names down for the desired team for both rounds
- For each 40 min round:
 - Each team should nominate a **Spokesperson** summarising the results at the end
 - Flipcharts should be used to document questions/results/recommendations
 - There is a Facilitator appointed for each topic (**they do not change tables**)
 - Groups will be split into smaller teams because of their size
 - After the first 20 min the sub-teams should merge their statements (which should take 20 min as well)
- After the second session each Spokesperson should present the results at the end of the session
 - 5 min maximum
 - **Send us (office@etp4hpc.eu) an email with their summary!!!!**

Main directions and assumptions

- “The “Extreme-Scale Demonstrators” (EsDs) are vehicles to **optimise and synergise the effectiveness of the entire HPC H2020 Programme** through the integration of isolated R&D outcomes into fully integrated HPC system prototypes; It is a key step towards establishing European exascale capabilities and solutions.”
(From the ETP4HPC SRA, chapter 8 p.67)
- “Integrate technologies into system prototypes, co-designing solutions and procuring HPC systems; the resulting HPC infrastructure will focus on **supercomputers of top-range capabilities** connected to mid-range EU national computing centres and to pan-European data and software infrastructure to offer supercomputing as a service”
- The Commission and participating Member States should develop and deploy a large scale European HPC, data and network infrastructure, including:
 - the acquisition of two co-designed, prototype exascale supercomputers and two operational systems which will rank in the top three of the world;

(From the EC Communication “European Cloud Initiative - Building a competitive data and knowledge economy in Europe”

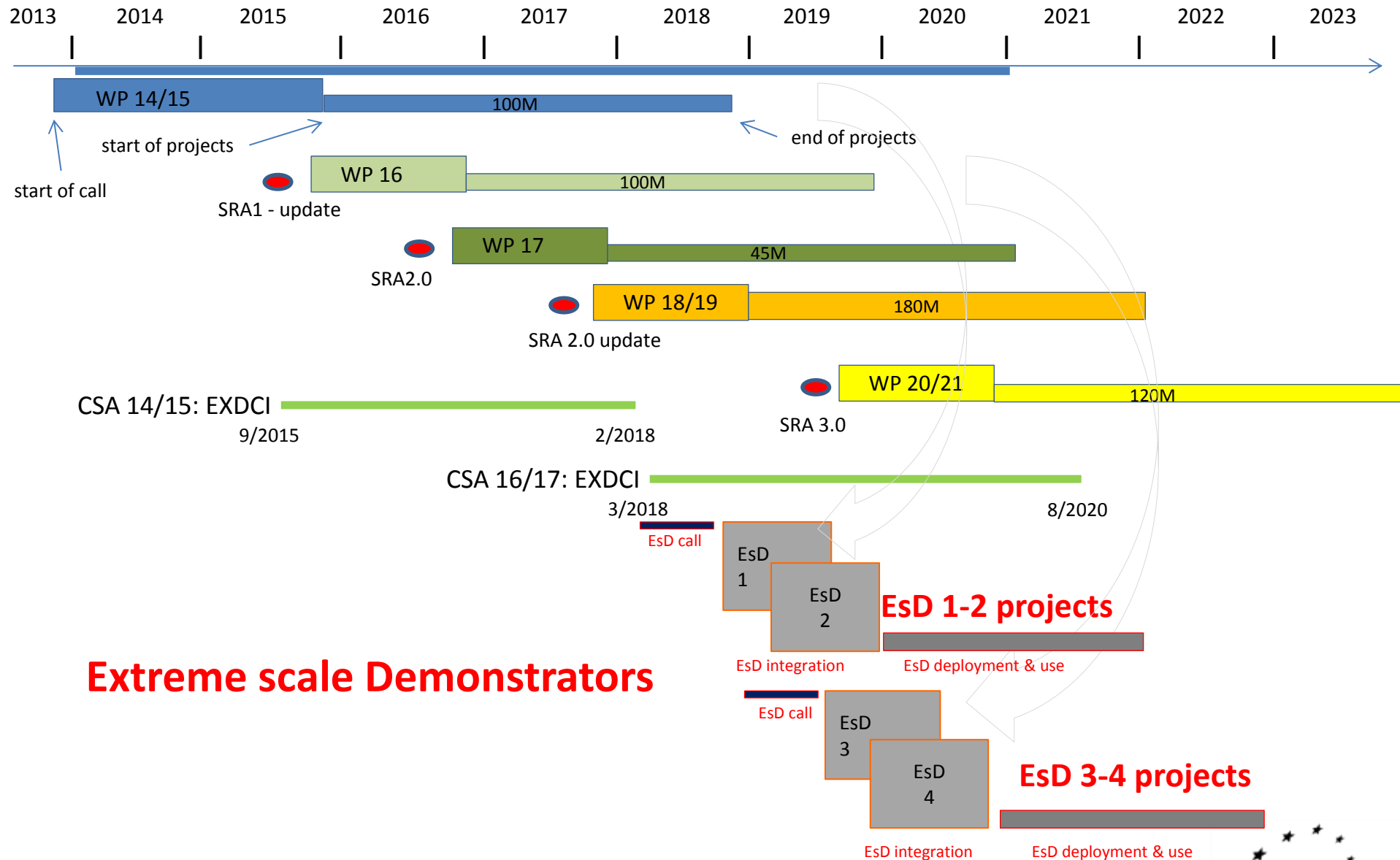
EsD State of Play

- EsD concept is outlined in the latest ETP4HPC SRA
- Next SRA will provide more details:
 - enable cPPP to propose concrete calls
- Aim of this Workshop: gather community input for next SRA
 - Main EsD characteristics and performance targets
 - Defining a suite of challenging pre-exascale problems / examples of possible applications
 - Options for funding and project implementation – timetable
 - Also: “Marriage Market” for parties interested in participating to the EsD calls
- Next steps
 - Digest results from workshop
 - Continue discussion at future events, e.g. SRA workshop at ISC in June

EsD proposal calls

- Two set EsD calls, each leading to two projects
 - Calls target technologies developed under FETHPC, but are open
 - EsD projects should start after end of FETHPC projects in WP2014/15 and WP2016/17
- EsD project structure
 - Phase A (18-24 months): Development, Integration and Testing
 - Little or no basic technology research
 - Substantial R&D focus geared towards integrating components and sub-systems developed in the preceding R&D projects
 - Phase B (18-24 months): Deployment and Use
 - Operated by a hosting center
 - EsD made available to application owners for code porting and development
 - Characterization and EsD validation, benchmarking based on real use-cases.

HPC-Horizon 2020 roadmap



Extreme scale Demonstrators

EsD 1-2 projects

EsD 3-4 projects



Assumptions / Fixed Points

- Diversity of System Architectures
- Design points must be pre-exascale (~400-500 PFLOPS) with a target of 5% (20-30 PFLOPS) installed and tested
- Phase A (integration) and Phase B (deployment) treated as ONE project
- Each EsD project consortium is composed of
 - **Technology providers** (HW, SW)
 - **Application providers** - e.g. CoE
 - Hosting **HPC centres**
 - At least one system integrator
 - At least one global system architect
- Application development outside of funding scope

Timetable for Interactive Session

- 13:15 INTRO Interactive session (2 x 40min min discussion sessions per “table”):
- 13:25 Start of Round 1 – Small team discussion
- 13:45 Merger Sessions of each table (joining the small teams)

- 14:05 Participants change tables for round 2
- 10 min
- 14:15 Start of Round 2 – Small team discussion
- 14:35 Merger Sessions of each table (joining the small teams)

- 14:55 Tables join in Meeting room

- 15:00 Result of the interactive sessions (5 min per session chair)
- 15:50 Wrap up, Next steps
- 16:10 End

Tentative Questions for Table Discussions (1/3)

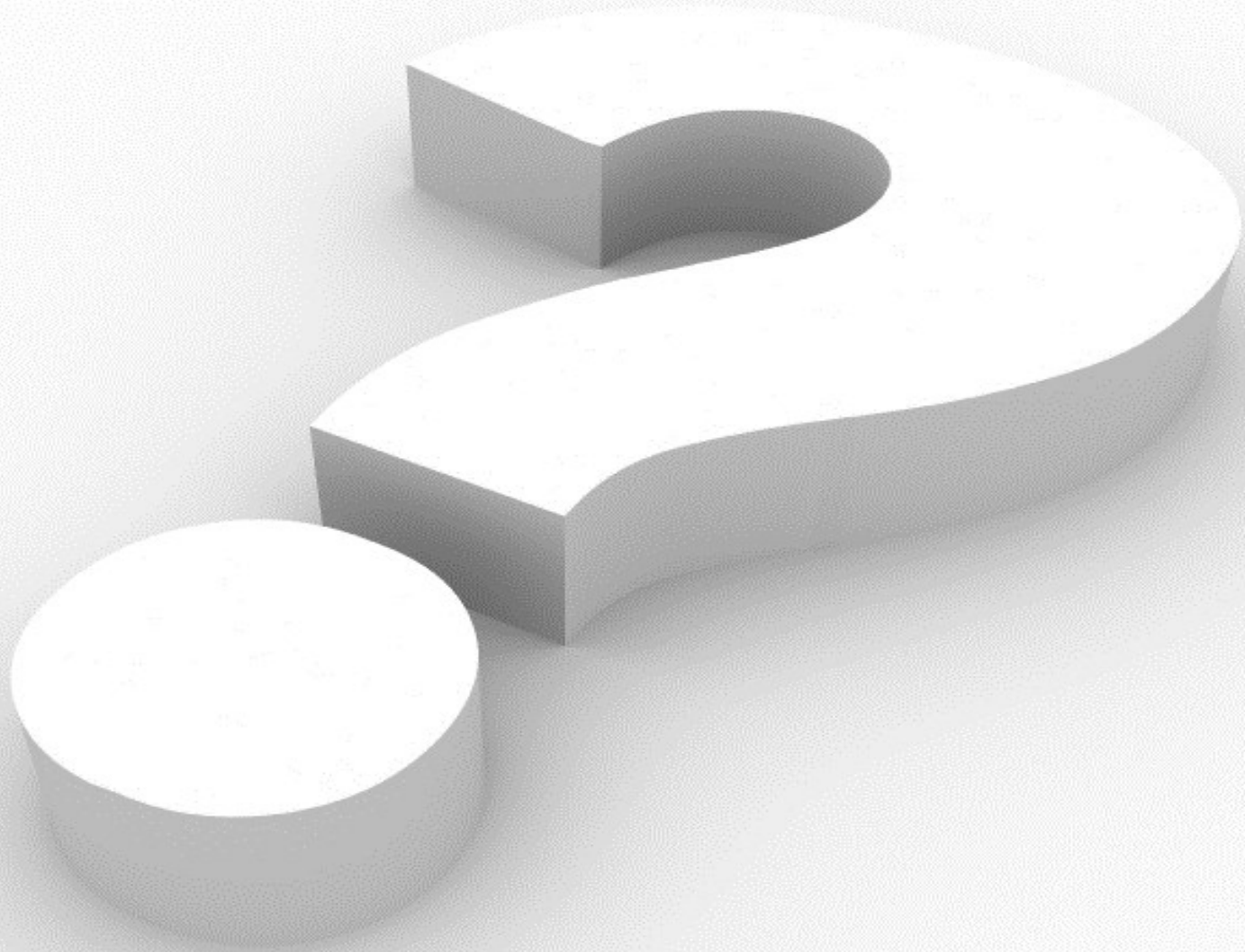
- Technical: total system target characteristics
 - Which characteristics to look at?
Flops, Flops/W, memory bandwidth/capacity, interconnect, scalability, reliability/resiliency, level of specialization, programming model, ... ?
 - Which “personalities” could the 4 EsDs target?
- Budget: required ESD project budget assumptions
 - Is the currently proposed funding envelope appropriate (ETP4HPC recommends 4 x 50 M€) ?
 - What would be a typical split of funding among activities in the project?
 - Is the currently proposed timeline realistic?

Tentative Questions for Table Discussions (2/3)

- Procurement: model and options
 - Suitability of standard and new procurement models for EsDs?
PPI, Innovation partnership, ...
 - How to ensure buy-in of HPC centres?
 - Potential conflict of roles?
centres & integrators as procuring entity & provider AND as project partners
 - Potential conflict of objectives?
leverage results from H2020 HPC programme & fair and open competition
- Composition of consortia – roles and tasks
 - Who could act as coordinator (HPC centre, integrator, ...)
 - How to ensure buy-in of application communities?
 - Which role can SMEs play ?
 - How to ensure a transition from EsDs to products?

Tentative Questions for Table Discussions (3/3)

- Use Cases Enabled by EsDs
 - What use cases could be enabled with the help of an EsD?
 - Which features and capabilities are required to make an EsD suitable for this use case?
 - How long must the EsD be available to achieve the use case goal?
 - Which software/hardware technologies developed with support from FP7/H2020 funding could be of particular interest?





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THANK YOU!

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Backup

Contribution / Role of Participants

Technology providers

- Technology integration
- Project management
- Testing and quality/performance assurance (phase A)
- Maintenance and service (phase B)

EsDs

Application owners / CoEs

- Application requirements and key challenges (phase A)
- Port, optimize application(s), use them productively (phase B)

HPC Centres

- Participate in co-design
- Manage system deployment (phase A)
- System operation, validation (phase B)