DEVELOPING EUROPEAN TECHNOLOGY TO SERVE THE HPC ECOSYSTEM

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The European HPC ecosystem is one of the best in the world with a large HPC user base, an outstanding HPC applications development community and a set of tier0 HPC datacentres.

The purpose of the ETP4HPC (European Technology Platform for High Performance Computing) is to develop a complete European HPC technology ecosystem.

This talk will present the current efforts undertaken under the Horizon 2020 programme to foster the development of European technologies for HPC and Big Data.
On 19 April 2016 the European Commission adopted the Communication ‘European Cloud Initiative – Building a competitive data and knowledge economy in Europe’. The Communication calls on the European Commission and Member States to create a leading European High Performance Computing and Big Data ecosystem, underpinned by a world-class high performance computing, data and network infrastructure. Such infrastructure will also support the EU to rank among the world’s top supercomputing powers by realising exascale supercomputers around 2022, based on EU technology. Europe should aim to have at least two sources of this technology.

… March 23, 2017

Declaration of European cooperation on HPC
Germany, Portugal, France, Spain, Italy, Luxembourg, Netherlands
2x pre-exascale systems 2019-20
2x world-class full exascale 2022-23

Development of high-quality competitive European Technology
Co-design
in at least one of the 2 exascale supercomputers

test-beds for HPC and big data
EUROPEAN HPC ECOSYSTEM

19 FETHPC projects running And more coming in 2017-2020

Coordination and Support Actions

HPC Technology Supply Chain

HPC Research Infrastructure

HPC Applications

Tools for industrial simulation & prototyping

The strength of the European HPC Supply Chain (technologies and applications)

Tools for addressing the Grand Challenges

European Economy

European Science

European Society

5/30/17 ETP4HPC Event
# EXCELLENCE IN HPC APPLICATIONS (CENTRES OF EXCELLENCE)

<table>
<thead>
<tr>
<th>Centre</th>
<th>Description</th>
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<tbody>
<tr>
<td>MAX</td>
<td>Materials design at the eXascale</td>
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<td>NOMAD</td>
<td>The Novel Materials Discovery Laboratory</td>
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<td>cam</td>
<td>Material sciences: An e-infrastructure for software, training and consultancy in simulation and modelling</td>
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<td>EoCoE</td>
<td>Energy: Energy oriented Centre of Excellence for computer applications</td>
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<td>esiwace</td>
<td>Climate: Excellence in Simulation of Weather and Climate in Europe</td>
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<td>CoeGSS</td>
<td>Global Systems Science: Center of Excellence for Global Systems Science</td>
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<td>bioexcel</td>
<td>Bioscience: Centre of Excellence for Biomolecular Research</td>
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<tr>
<td>CompBioMed</td>
<td>Biomedicine: A Centre of Excellence in Computational Biomedicine</td>
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<tr>
<td>POP</td>
<td>Performance: Performance Optimisation and Productivity</td>
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How does this work?

- cPPP signed Dec. 2013 with ETP4HPC (Public-Private Partnership) - Entry into force Jan. 2014
- Centres of Excellence joined in 2015 ('private' side = ETP4HPC + CoEs)
- ‘Structured dialogue’, Partnership Boards twice a year
- Private side provides input to define H2020 HPC programmes – which are funded and operated by the EC
- Commitment from private partners to match EC funding
- Joint progress and impact monitoring
- Collaboration with PRACE, BDVA/Big Data PPP, HiPEAC, Eurolab4HPC...
78 Members
(as of May 2017)

• 51 Full
• 27 Associated
• 39 Private
• 25 SMEs
• 11 Larger companies
• 36 Research organisations
• Established in 2011
• Officially a Dutch Association since December 2012
EC funded research: FETHPC calls
ETP4HPC providing input through SRA

EC -> Work Programme -> Calls

Input incl. ETP4HPC SRA

Projects

HPC Ecosystem

Consortia submissions
**ACTIVITIES: SRA = core mission**

**Strategic Research Agenda**  
(Multi-annual Roadmap)  
- 2013, 2015, 2017 in the making  
- 8 topical working groups 150 to 200 experts  
- Collaboration with BDVA, HiPEAC & Eurolab4HPC  
- Input for H2020 FETHPC and CoEs calls  
- Extreme-scale Demonstrators concept (WP18-20)
Hot topic... WP18-20 input

• Being elaborated actively by ETP4HPC, with CoEs, PRACE and talking to BDVA and other stakeholders

• Discussed with the EC within the framework of the cPPP (structured dialogue)
  ▪ Technology – « FETHPC » follow-up
  ▪ Extreme Scale Demonstrators to put together FETHPC outcomes
  ▪ Centres of Excellence (second period)
  ▪ Coordination and support action

• SRA Version 3 (2017 edition) will develop a more detailed technical vision and WP18-20 calls will implement the SRA
"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*

EsDs will fill critical gaps in the HPC H2020 programme:
- Bring technologies from FET-HPC closer to commercialisation (TRL 7-8)
- Combine results from targeted R&D efforts into a complete system (European HPC technology ecosystem)
- Provide the missing link between the 3 HPC pillars: Technology providers, infrastructure providers, user communities (co-design)
Funding WP 14-20

ETP4HPC proposal (Jan 2017)

- CSA 19
- ESD 20
- ESD 18
- CSA 17
- COE 18
- ESD 18
- COE 15
- CSA 15
- RIA 19
- RIA 17
- RIA 16
- RIA 14/15
- ETP4HPC proposal (Jan 2017)
UPCOMING EVENTS IN 2017

• **EHPCSW (Barcelona):**
  May 17\textsuperscript{th}: cPPP meeting
  May 18\textsuperscript{th}: **EsD - Roundtable (FETHPC projects, CoE, HPC centers, system integrators, technology providers)**
  May 19\textsuperscript{th}: SRA-workgroup leaders’ internal meeting (Barcelona)

• **June 22\textsuperscript{nd}: Workshop at ISC with industrial users: ”how to benefit from EsDs?”**

• April-May-June-July: SRA3 writing & interlock with workgroups, integration, tuning, review

• **September 15\textsuperscript{th}: release and distribution of SRA3** (after WP17 call closure)

• **SC17 Nov??: BOF - review of the European HPC landscape and its projects**
TO EXASCALE

... AND BEYOND
“Building a globally competitive European world-class HPC technology value chain”

THANK YOU FOR YOUR ATTENTION!

For more information:
www.etp4hpc.eu ■ contact: office@etp4hpc.eu

HPC strategy, work programmes and HPC related news:
ec.europa.eu/horizon2020-hpc