

EuroHPC
Joint Undertaking

EuroHPC Summit Week 2019

BoF

"The EuroHPC Infrastructure and Research & Innovation Pillars"

Overview

- Presentation of the group
- Tasks of the INFRAE
- Objectives and general framework
- State of play
- Work plan

The INFRAG Group



Members

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The INFRAG Group



Observers

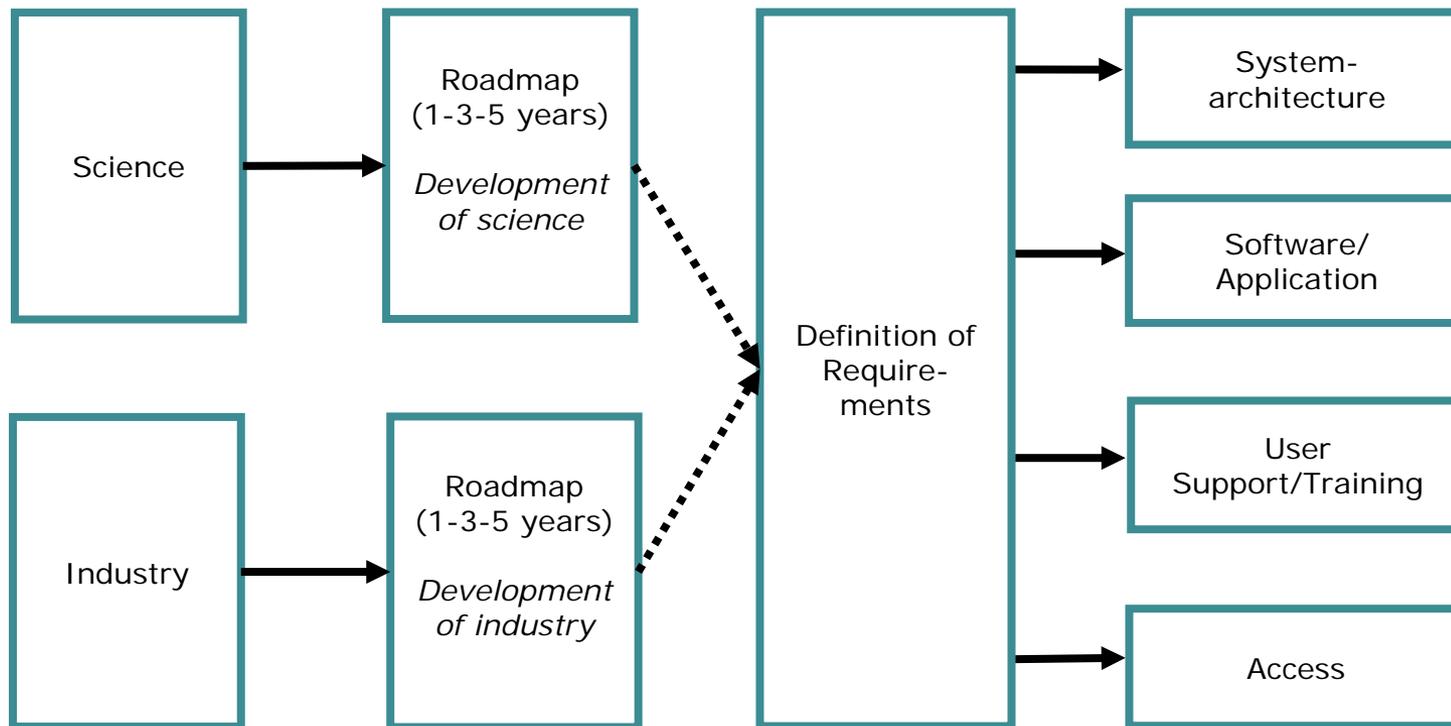
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Tasks of the INFRAG

Draw up and regularly update the draft multiannual strategic agenda

- **Acquisition of the petascale and pre-exascale supercomputers**
- **Specifications for the selection of the hosting entities**
- **Planning for the acquisition of infrastructure**
- **Identification of needed capacity increases**
 - ... types of applications
 - ... user communities to be addressed
 - ... system architectures
- **Integration with national HPC infrastructures**

Organise public consultations



MULTIANNNUAL STRATEGIC
AGENDA

Structure of the multiannual strategic agenda



The European Dimension

Scientific and industrial user communities: challenges and opportunities

Technology requirements

Service requirements of infrastructure

Infrastructure considerations

Overall recommendations

Scope

- *The Multiannual Strategic Agenda has been defined by the EuroHPC Infrastructure Advisory Group (INFRAG) according to the mandate specified by the EuroHPC Regulation.*
- *The purpose of the document is to **advise the Governing Board** of the EuroHPC Joint Undertaking on the infrastructure development roadmap that EuroHPC should follow in the coming years*
 - **number and types of supercomputing systems that EuroHPC should procure,**
 - **Long term strategy of the HPC resources pooling and federation in Europe.**

Document adopted by INFRAG on 9 January 2019 and used as input for the EuroHPC Call for Expression of Interest of Hosting Entities for pre-exascale and petascale systems

Key points and recommendations

User and Technology considerations

- **Challenges and opportunities for user communities**

Architectural aspects

- **Technical considerations incl. CPU, memory, accelerators, energy efficiency etc.**

Procurement recommendations

- **E.g. Open process vs Competitive Dialogue**

Performance targets and number of systems

- **At least 2 pre-exascale systems. Implemented with diverse architectures (CPU-centric vs Accelerated-oriented).**
- **Performance goals: 150+ Pflops for pre-exa and 10-50 Pflops for petascale systems.**

Recommended timeline for procurements and systems installation



USER REQUIREMENT

Scientific Users

Scientific User Requirements

EuroHPC will provide leadership-class, petascale, pre-exascale computing infrastructure for European science and industry

Driving scientific excellence and innovation across disciplines and applications

Support proven European excellence in e.g. software and modelling and foster new user communities with training for the next generation of scientists in Europe

- **“acquiring and providing a world-class petascale and pre-exascale supercomputing and data infrastructure for Europe’s scientific, industrial and public users, matching their demanding application requirements by 2020. ...”**
- **“supporting an ambitious research and innovation agenda to develop and maintain in the EU a world-class HPC ecosystem, exascale and beyond ...”**

INFRAG Scientific User Requirements: methodology

A suite of recommendations based on user requirements will be a crucial component of the Multi-Annual Strategic Agenda

INFRAG will form a working group to

- **Identify challenges and opportunities for the user communities**
- **Gather information and synthesise its recommendations based on user requirements**

Users are not an homogeneous group. We must understand requirements from across disciplines and levels of experience and expertise

- **Build on the PRACE Scientific Case for Computing 2018-2026.**
- **Utilise preliminary EuroHPC reports on e.g. user requirements which included a survey of needs, challenges and forward planning.**
- **Plan workshops and consultation with stakeholders to enable open discussion and gather requirements ensuring user needs (current and future) are conveyed.**

Scientific User Requirements: topics to address

- **An overview of the scientific challenges and opportunities enabled by the**
- **proposed infrastructure**
- **Needs from the application areas including:**
 - Compute and storage
 - Floating-point throughput, memory bandwidth and communication latency
 - Interconnect bandwidth and latency
 - Storage and I/O
- **Balancing hardware needs with cost and usability**
- **CPU Architectures including Accelerators to include current landscape**
- **near future expectations and challenges for optimal accelerator impact**
- **Operations and environments**
 - User work to move software to work on new platforms if GPUs are used (included rewriting parts of the code of CUDA)



USER REQUIREMENT

Industrial Users

Industrial User Requirements

- EuroHPC Platforms will be open to both research and industry users
- INFRAG (Infrastructure Advisory Group) is designated by EuroHPC governance to take into account user input: research and industrial needs and requirements
- INFRAG leads a Working Group to write a white paper gathering inputs provided by all national industrial user initiatives

Industrial User Requirements

Mastering HPC/HPDA in all its dimensions is decisive for European Industry in order to stay competitive in the global market so EuroHPC is preparing to:

- 1. Transfer knowledge from research to European Industry**
- 2. Develop a co-design approach between technology providers and advanced users**
- 3. Take into account inputs from Industry Community, listing the specific needs and requirements**

Industrial User Requirements

EuroHPC pays great attention to involve SMEs in its dynamics

- 1. Because SMEs are a very important part of European economy**
- 2. SMEs have very specific requirements, especially because many of them do not have skill to be HPC users**
- 3. EuroHPC is planning to set a « Competence Centre » in every partner-state to provide permanent support to SMEs future users**



ACCESS POLICY

Recommendations on Access Policy

Rationale

- GB shall define the access rights to the Union's share of the available time on the pre-exascale supercomputers and petascale supercomputers and to the Union's share of available time on national supercomputers (EuroHPC regulation)
- The INFRAG, as part of the Industrial and Scientific Advisory Board, is analysing different strategies/policies and will present to the Executive Director and Governing Board the corresponding recommendations

Recommendations on Access Policy

Methodology

- INFRAG created a working group to prepare these recommendations
- The working group is composed of five members of the INFRAG, external experts from PRACE, including PRACE AISBL and PRACE Hosting Members, and adequate representation of users and user communities, including industry
- Organize one open day and/or open consultation, to present the findings and the directions of the proposal. This will allow all users, communities, and stakeholders to comment and contribute to the final proposal
- Recommendation by end of Sep. 2019, to permit adequate time for approval by the GB, publication and start of the implementation

Recommendations on Access Policy

Topics to analyse

- Evaluation method: independent, transparent, high-level, excellence on science and/or innovation
- Evaluation criteria: for science and industry
- Available to users from science, industry, including SMEs and the public sector
- Free at the point of usage for publicly funded research and innovation activities
- How to deal with exceptional, urgent computing for emergency and crisis management
- Obligations of the awarded users: citations, papers, presentations, conferences, ...
- Identification of Key Performance Indicators of the complete process, including peer-review, impact of accessed projects, ...



**Thank you for your
attention!**