Interactive Computing E-Infrastructure Public Information Event

FET FLAGSHIPS

FENIX RESEARCH INFRASTRUCTURE

Co-funded by the European Union

ICEI/Fenix overview

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Barcelona

15 March 2018

The ICEI project has received funding from the European Union's Horizon 2020 research and innovation programme under the grant agreement No. 800858.

Disclaimer

Neither this announcement nor the event itself signifies the beginning of a procurement procedure or constitutes a commitment by the public procurers involved in the presentation to undertake such exercise at a later stage

Human Brain Project

Human Brain Project

- FET flagships
  - Future & Emerging Technologies projects (co-)funded by European Commission
  - Science-driven, seeded from FET, extending beyond ICT
  - Ambitious, unifying goal, large-scale
- Human Brain Project (HBP) flagship
  - Currently 118 participants in Specific Grant Agreement 1 (SGA1)
  - SGA1 runs from 2016-18 with an overall budget of ~90 M€
- Goals of the HBP
  - Enable research aiming for understanding of the human brain
  - Transfer neuroscience knowledge for development of future technologies

Fenix and ICEI

- Goal of Fenix: Develop a set of e-infrastructure services that will be federated to form the Fenix Infrastructure
  - Establish HPC and data infrastructure services for multiple research communities
  - Develop and deploy services that facilitate federation
  - Science community driven approach
    - Fenix providing infrastructure services as basis for science community specific platform services
- First step: ICEI = Interactive Computing e-Infrastructure
  - Executed within the HBP Framework Partnership Agreement
  - Ambition to provide the relevant HPC and data services for HBP research
  - Part of the resources provided to PRACE

Fenix/ICEI Partners

- Currently involved centres
  - BSC (ES)
  - CEA (FR)
  - CINECA (IT)
  - ETHZ/CSCS (CH)
  - JUELICH/JSC (DE)
- Consortium features
  - European HPC centres that provide resources within PRACE
  - Strong links to key science drivers
- Foreseen extensibility
  - Open for more partners and stakeholders

ICEI Objectives

- To design, build and operate a federated e-infrastructure for the HBP and other science communities driven by scientific use cases with the following key characteristics
  - Interactive Computing Services
  - Elastic access to scalable compute resources
  - Federated data infrastructure
- Objectives for hardware capabilities
  - Realise an aggregate memory capacity of more than 10 PByte using dense memory technologies
  - Tight integration with HPC systems that provide an aggregate compute performance of at least 50 PFlop/s

ICEI Project Implementation

- Coordinated procurement of
  - Equipment at different sites
  - Related maintenance services, licenses for software components
  - R&D services for realizing elements of the ICEI e-infrastructure
- Establishment of a suitable e-infrastructure governance
- Develop a resource allocation mechanism to provide resources to HBP users and European researchers at large
- To assist in the expansion of the e-infrastructure to other communities that provide additional resources

Research Communities

- Brain research
  - Scalable brain simulations and challenging data analytics requirements
  - Building-up knowledge base as part of the Neuroinformatics Platform
- Materials science
  - Data sets from simulations but also experiments
  - European community already engaged in enabling data sharing
- Genomics
  - Explosion of data volumes
  - Some groups start to exploit HPC infrastructures
- Physical science experiments
  - Data from large-scale experiments, e.g. ESS
  - Need for scalable simulations for interpreting experimental results or to process data

Common Features and Requirements

- Variety of data sources
  - Distributed data sources
  - Heterogeneous characteristics
- HPC systems as source and sink of data
  - Scalable model simulations creating data
  - Data processing using advanced data analytics methods
- Aim for data curation, comparative data analysis and for building-up knowledge bases

→ **Need for infrastructure to facilitate data sharing and high-performance data processing**

HBP Use Cases

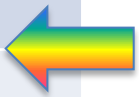
- GUI-based interaction with extreme scale network models
  - Interactive monitoring and steering of scalable simulations
- Enrichment of the human brain atlas
  - Enable access and processing of 2-6 PByte of data per brain at 1 µm resolution
- Validation of neuromorphic results
  - Analysis of the similarities and differences of results obtained from software simulations and from neuromorphic systems
- Neurorobotics Platform services
  - Realisation of internet-accessible simulation system that allows the simulation of robots controlled by spiking neural networks

Procurement

- All partners procure in their name and (formally) on their behalf
  - No joint procurement, only a “coordinated procurement”
  - Technically strongly coordinated
- Procurement of equipment
  - To be deployed at the site of the respective procuring entity
- Procurement of R&D services
  - Results to be potentially used by other partners

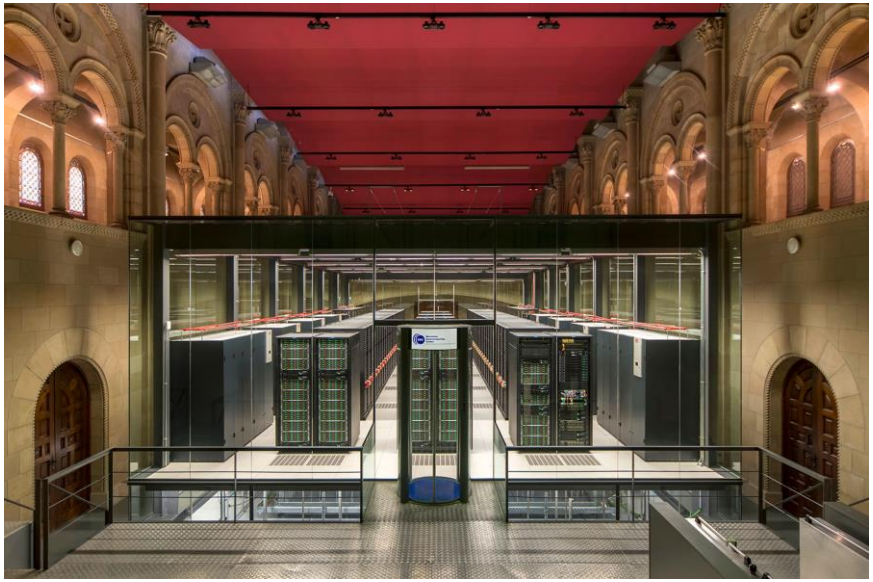
Today's Agenda

10:00	ICEI/Fenix overview	D. Pleiter
10:30	Architecture overview	S. Alam
11:00	Infrastructure plans	J. Bartolomé, J.C. Lafoucriere, G. Fiameni, S. Gorini, D. Krause
11:30		*Coffee break*
12:00	R&D topics	B. Hagemeier, D. Krause, S. Gorini, J.C. Lafoucriere, G. Fiameni
13:15	Procedural and legal aspects	D. Pleiter
13:30		*Lunch break*
14:30	Q&A	B. Orth



A few logistics…

- Coffee break will take place in the neighbouring room
- Lunch break will take place at the Foyer of Torre Girona building
- MareNostrum visit from 4 – 5pm after the meeting



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Thank You

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