

Fenix Consortium to build a Federated Data and Computing Infrastructure for the Human Brain Project and other communities

The European supercomputing centers BSC (Spain), TGCC/CEA (France), Cineca (Italy), CSCS (Switzerland) and JSC (Germany) have joined forces to design and build a federated data and computing infrastructure. The realization of the so-called Fenix research infrastructure, which in the beginning will be used primarily by the Human Brain Project (HBP) [1], started officially in January 2018 with the launch of the “Interactive Computing E-Infrastructure” (ICEI) project. The ICEI project is co-funded by the European Commission through a Specific Grant Agreement (SGA) under the umbrella of the HBP Framework Partnership Agreement (FPA) [2].

The five partners in the Fenix consortium—all of which are also members of the HBP’s High Performance Analytics and Computing (HPAC) Platform subproject and hosting members of PRACE—plan to deliver a generic set of e-infrastructure services which will serve the HBP and other communities as a basis for the development and operation of community-specific platforms. To this end, the design and the implementation of the Fenix infrastructure are driven by the needs of the HBP as well as other scientific communities with similar requirements (e.g., materials science) [3, 4].

The key services provided by Fenix will encompass interactive computing services (supporting direct user interaction with data-intensive distributed workloads), scalable computing services (supporting scalable workloads), and a federated data infrastructure (including federated archival data repositories optimized for

capacity, reliability and availability, and site-local active data repositories close to compute or visualization resources). A distinctive feature of the Fenix infrastructure is that data storage and scalable computing resources will be in close proximity to each other and tightly integrated. In this manner, Fenix will enable HBP use cases such as GUI-based interaction with large-scale neural network simulations, massive data processing and analysis for the HBP Human Brain Atlas, the validation of simulation results obtained on neuromorphic hardware, and the implementation of the HBP Neurorobotics Platform. Virtual Machine (VM) services provided as part of the Fenix infrastructure are hosting the HBP Collaboratory, the central gateway to all HBP Platforms, and other HBP platform services.

The ICEI project will realize key elements of the planned infrastructure through procurements of R&D services and equipment, which will be coordinated between the partners. In preparation of these procurements, a public information event was held in Barcelona on March 15 in order to inform interested suppliers about the expectations and plans of the ICEI partners, and to gather their feedback. Other significant components of the infrastructure will be realized through in-kind contributions from the participating supercomputing centers.

Beside the technical infrastructure, the Fenix consortium will also establish a suitable governance structure and define mechanisms for the allocation of Fenix resources. Stakeholders,

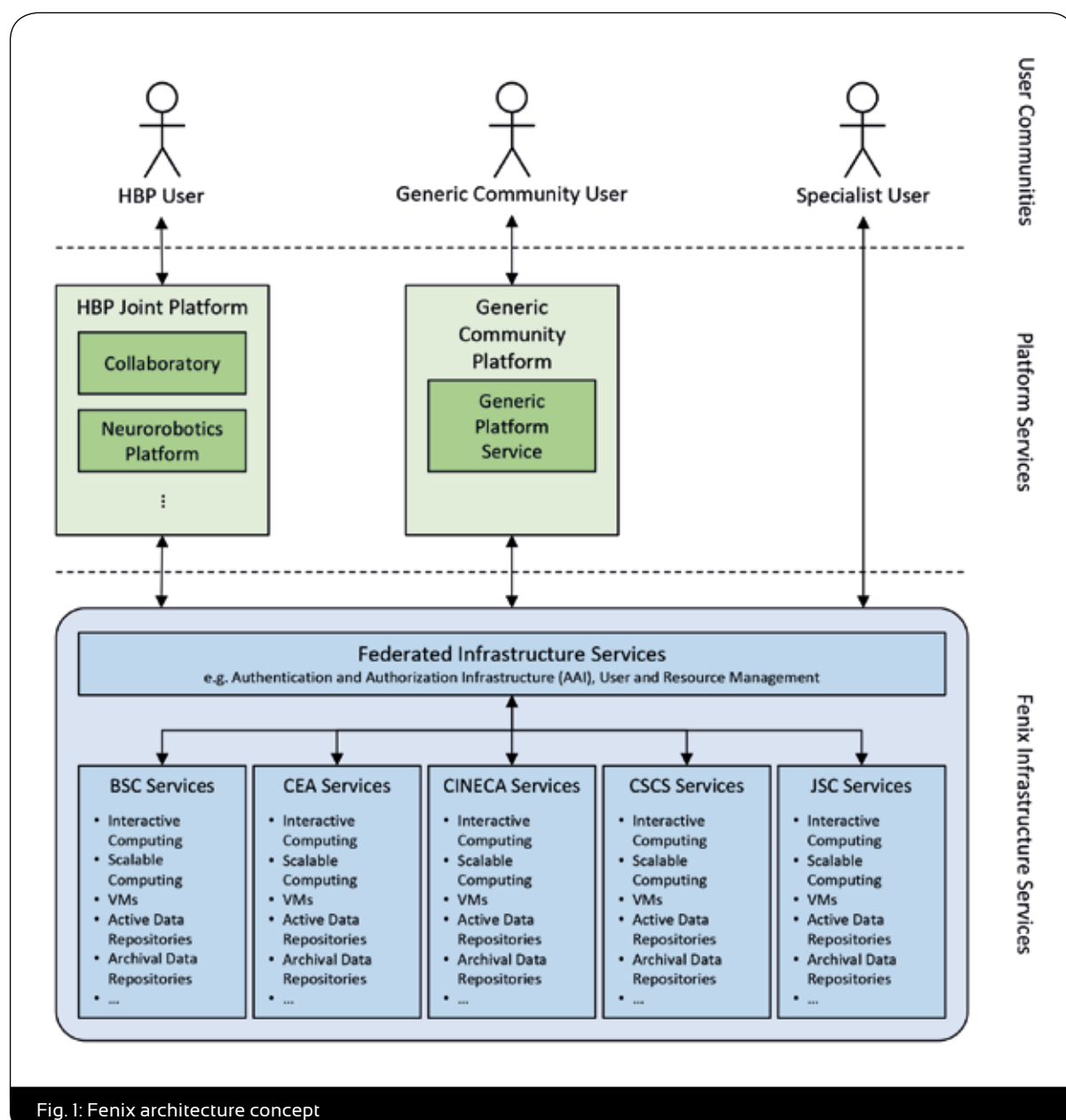


Fig. 1: Fenix architecture concept

like the Fenix partners and the HBP, who contribute substantial financial or other resources to the Fenix infrastructure, will be represented in the supreme body of the Fenix governance

structure, the Fenix Council. Among other things, the Fenix Council is responsible for defining and updating the requirements that guide the infrastructure co-design. While the Fenix Council will



Fig. 2 ICEI Public Information Event on 15 March 2018 in Barcelona

also determine the general principles for the allocation of Fenix resources within stakeholder communities (which must be based on peer review), each community will be responsible for the actual distribution of their share within that community. Overall, of the Fenix resources funded through ICEI, a total share of 25% will be made available to the HBP, and 15% to European researchers at large (through PRACE). Fenix is open for other communities who want to contribute resources to and use the infrastructure.

According to the ICEI project schedule, the deployment of the first Fenix infrastructure components at the majority of the participating centers and the first demonstration of the key services are expected to start towards the end of 2019. All infrastructure services are planned to be operational in early 2021.

References

- [1] Human Brain Project, <https://www.humanbrainproject.eu>
- [2] Framework Partnership Agreement – Signature (press release), https://www.humanbrainproject.eu/en_GB/fpa-signature
- [3] Human Brain Project: Towards a European infrastructure for brain research, <http://inside.hlr.de/editions/16autumn.html#human-brain-project-towards-a-european-infrastructure-for-brain-research> (Reference to an article in a previous InSiDE edition)
- [4] Human Brain Project successfully entered the next Phase (Reference: see page 17)

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