PRACE Operational Services for the HPC Eco-system

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WP6 Objectives and Activities

Operation and coordination of comprehensive common PRACE operational services (Task 6.1)	• Continue the work on the organisational structure, operational procedures, monitoring, of the common services for the European HPC infrastructure
Analysis and development of prototypal new services (Task 6.2)	• Analyse new innovative services and investigate their prototypal implementations at the pre-production level to assess the functionality and the possible adoption in a next phase as production services
Link with other e-infrastructures and CoEs (Task 6.3)	• Identify commonalities and foster the technical interoperability across the services to guarantee a more integrated vision. Create bilateral collaborations in Security and Data Management

T6.1 Operation and coordination of comprehensive common PRACE operational services

- It enforces the operation of the whole PRACE eco-system working on:
  - Status of Tier-0 (and Tier-1 for Tier-0 services)
  - Status of new Tier-0 sites and system upgrades
  - Network Services
  - Data Services
  - Compute Services
  - AAA Services
  - User Services
  - Monitoring Services
  - Generic Services
  - Operational Security (Security Forum)

Analysis and development of prototypal new services

- New services in prototypal phase:
  - Service 1: Urgent Computing
  - **Service 2: Links to large scale scientific instruments**
  - Service 3: Smart post-processing tools including in-site viz
  - Service 4: Provision of repositories for European open source scientific libraries and applications
  - Service 5: Evaluation of lightweight virtualisation technology
  - Service 6: Evaluation of new prototypes for Data Analytics services

Service 2: Links with large-scale Scientific Instruments

- We are working in PRACE 5IP on two different pilots targeting CERN and ESRF, as LSSI.
- CERN pilot is in the evaluation phase
- With ESRF we selected a number of Tier-1 sites where applications for the elaboration of data coming from ESRF have been deployed
- More pilots will come with the PRACE 6IP project

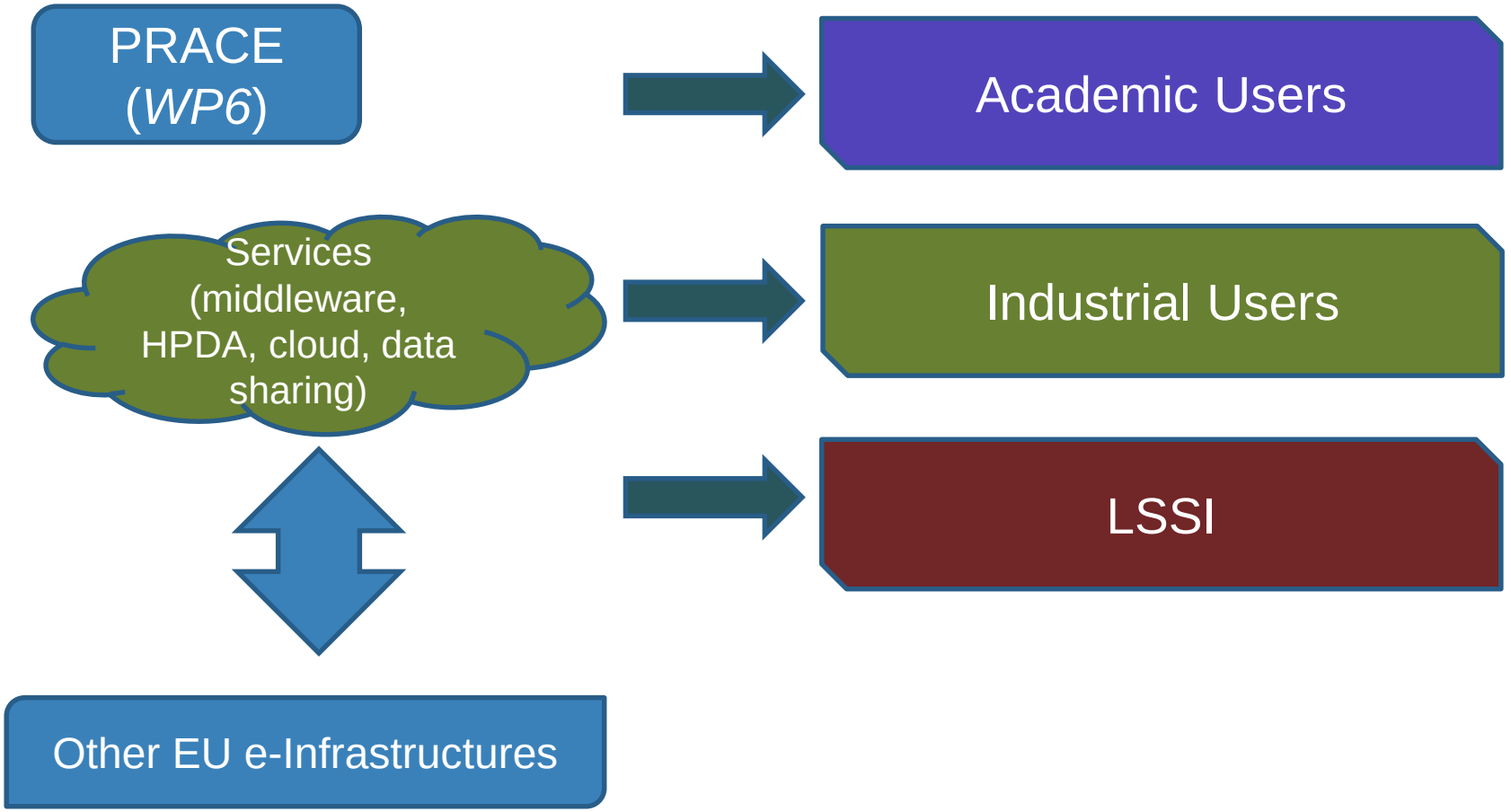
Link with other e-infrastructures and CoEs (Task 6.3)

- This tasks manages the collaboration with other e-infrastructures and EU-funded project through the establishment of MoUs or pilots cases
  - EUDAT pilots for data/compute complex workflows (under the DECI initiative)
  - eInfraCentral initiative for a european comprehensive catalogue of IT services
  - Management of the ESRF and CERN collaboration
  - …

From PRACE 5IP to PRACE 6IP

Operation and coordination of comprehensive common PRACE operational services (Task 6.1)	• Continue the work on the organisational structure, operational procedures, monitoring, of the common services for the European HPC infrastructure
Prototyping new Services towards EDI (Task 6.2)	• This task will continue the experience developed in the previous PRACE-5IP and it will also evaluate new services aimed for industrial users through the adoption of pilot cases based on innovative technologies
Link with other e-infrastructures (Task 6.3)	• The aim of this task is to individuate synergies and common strategies with other e-Infrastructures and stakeholders. Pilots with EUDAT/ICEI for data services, with GEANT for AAI, cloud services with EOSC-hub, LSSI with AENEAS et al.
New Services to Industry Towards Open R&D (Task 6.4)	• In this activity PRACE will assess through different pilots with European industries the technical, legal and financial requirements needed for a possible deployment of pre-competitive R&D and production activities beyond the current Open R&D offer.

In summary..


PRACE
(*WP6*)
Academic Users
Services
(middleware,
HPDA, cloud, data
sharing)
Industrial Users
LSSI
Other EU e-Infrastructures

FENIX

RESEARCH INFRASTRUCTURE

Overview

Bologna - 10.10.2018

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

Overview

- The objective of Fenix is to provide IT **Infrastructure Services** for **Domain-specific Platforms**
  - These services are designed and operated with high-availability and reliability in mind
  - The Infrastructure Architecture will reflect the needs of the target Science Communities

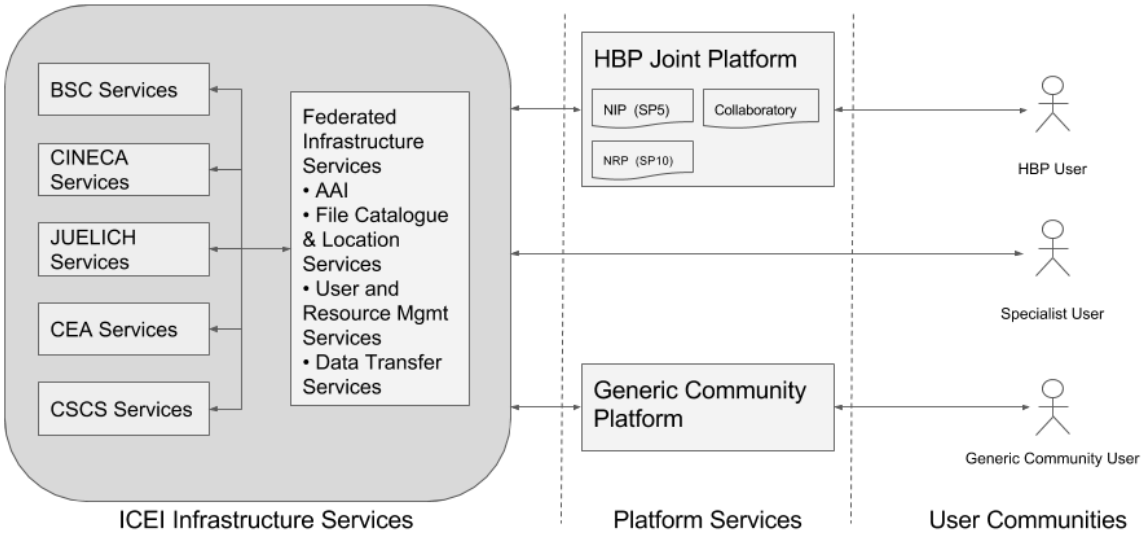
- The specific **service targets** are:
  - Interactive Computing Services
  - Scalable Computing Services
  - Federated Data Services

- To be the most useful, these services should be integrated in one Infrastructure and this implies:
  - Federation of User Identities
  - Standardised services available at all participating sites
  - Centralised user and resource management, reporting and accounting

Community	• A (virtual) organization of scientists that is entitled to use a given fraction of resources available within the Fenix infrastructure • Initially foreseen: HBP (25%), PRACE (15%)
Project	• Communities create projects to which they allocate resources at their own discretion
User	• Users are associated with communities and projects. • Privileged users will have special permissions to manage the Fenix infrastructure
Site	• 5 initial sites: BSC, CEA, CINECA, CSCS, JUELICH • Sites contribute their resources to Fenix • Accounting information for consumed Fenix credits sent to FURMS

Fenix Architectural Overview

- Fenix will provide a set of **Federated Infrastructure Services**:
  - Authentication and Authorisation Infrastructure (AAI)
  - Data Location Services (aka File Catalogue Services)
  - Data Transfer Services
  - User and Resource Management Services
- These *Infrastructure Services* will provide a standard set of interfaces:
  - The Community-specific portals and generic portals will use these interfaces to deliver the services to the end users
  - In some cases specific specialist users may interact directly with the interfaces



Main Services (1/2)

Interactive services

- Support computing while permitting on-the-fly interactions
  - the runtime can be modified interactively so that the user can gain insight on parameters, algorithmic behaviour, and optimization potentials
- Enable the capability to execute applications while editing the source code
  - notebooks
- Visualization and manipulation of large data sets

Scalable Computing Services

- Piz Daint at CSCS will form a major part of these services
  - A hybrid multi-core system with 7135 nodes
  - >27 PFlop/s aggregate peak

Main Services (2/2)

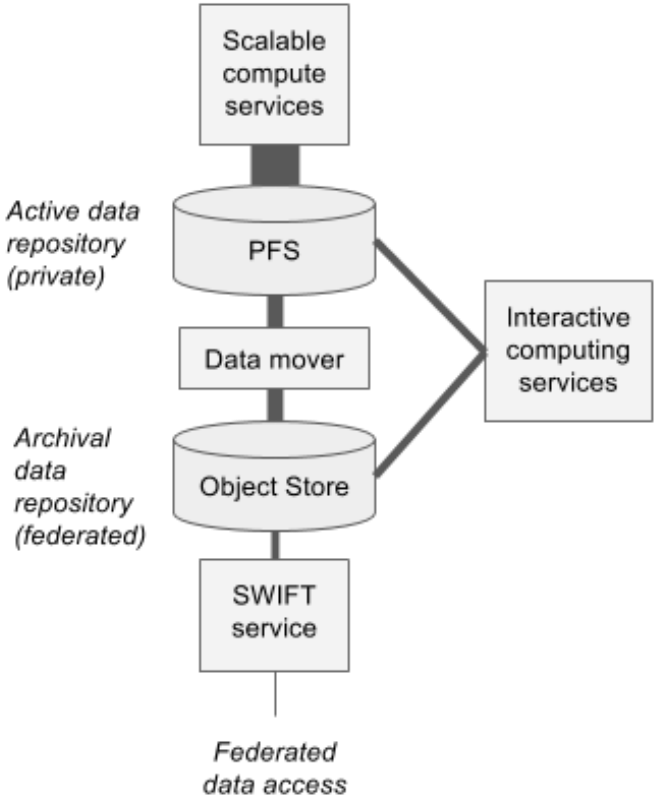
Federated storage services

Federated data repositories offered:

- Active Data repositories
  - High-performance storage
  - Some based in non-volatile memory
- Archival Data repositories
  - Data persistence storage
  - Tiered storage (online and tape)

Data services associated with repositories:

- Catalogue & location services
- Data transfer and management services



THANK YOU FOR YOUR ATTENTION

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