



THE HBP HPAC

(High-performance analytics and computing platform)

Beyond traditional HPC

NOVEMBER 27, 2018 | B. SCHULLER

OUTLINE



- The HPAC platform
 - Current state
 - Issues and lessons learned
- Fenix, ICEI and all that

HPAC



- Common authentication – single sign on
- APIs for job submission, data access, data movement, ...
- Allow integration with the Collaboratory
- Enable user workflows

Visualisation Systems



UNICORE

Platform services, APIs, policies, support, ...

HPC, Storage, Cloud VMs



HPC, Storage



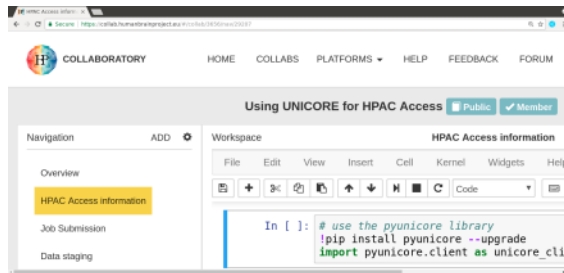
HPC, Storage



HPC, Storage, Cloud VMs

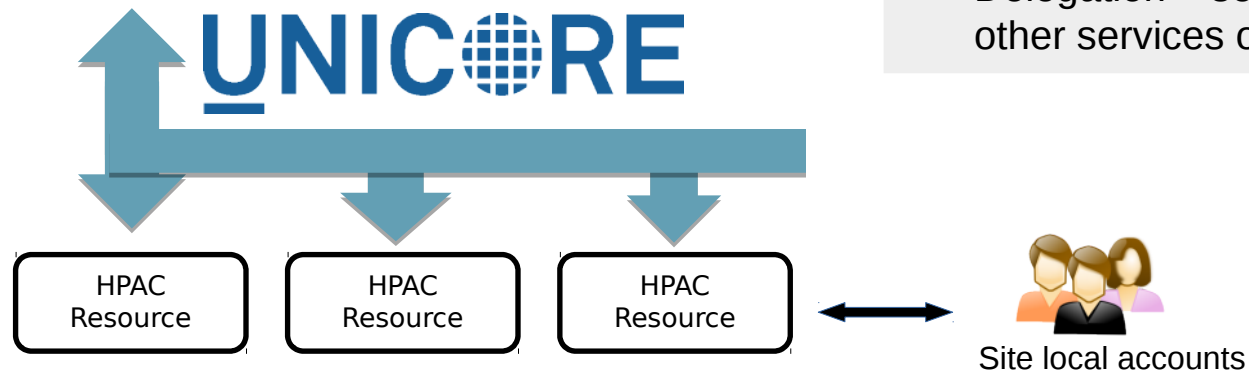


SINGLE SIGN ON / COLLABORATORY



HBP accounts

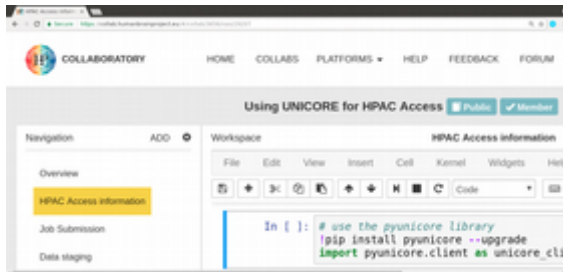
- Single login with HBP account
- HBP account automatically mapped to local account
- Delegation – service can use other services on user's behalf





- Middleware components for integration of HPC into federated environments
 - Federated authentication, site-local authorization, account mapping
 - Batch system abstraction
 - File system access
- REST APIs for jobs, data, workflows
- Simplifies HPC use for non-experts (Application concept, abstract resource model, predefined applications, workflow templates, ...)

ENABLE USER WORKFLOWS



HBP accounts

3. Use

Visualization Service



1. Launch simulation

HPC simulation



Data access

Storage



2. Results

ACCESS ISSUES



- Still very much “traditional HPC” mindset at the HPC centers
 - Getting compute time
 - PIs have to write technical project proposals
 - PRACE calls, national calls, ...
 - Sites have different policies, user agreements, ...
- Can be difficult to get access for new or platform users
 - Service accounts? How to manage compute budget?

INTEGRATION ISSUES



- Resources exist that are not integrated - “silos”
 - Separate credentials and tools required, e.g. CSCS object store
- Cross-site resource access and workflows
 - Not all HPC filesystems easily accessible to services running on VMs
 - Difficult to access / move big datasets

USER / WORKFLOW ISSUES



- Very practical problems
 - Run simulation, visualize / evaluate
 - Access data on HPC from Jupyter notebooks
 - Build platforms with simple access for “outside” users
 - Student training / MOOCs
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FENIX

FENIX AND ICEI



- Federated e-infrastructure <http://fenix-ri.eu>
- BSC, CEA, CINECA, CSCS, Jülich (+ EPFL as coordinator)
- 25% of resources for HBP
- Concrete project allocation to be done within HBP
- ICEI: EU Project to specify and procure services and hardware for the FENIX RI

FENIX CONCEPTS

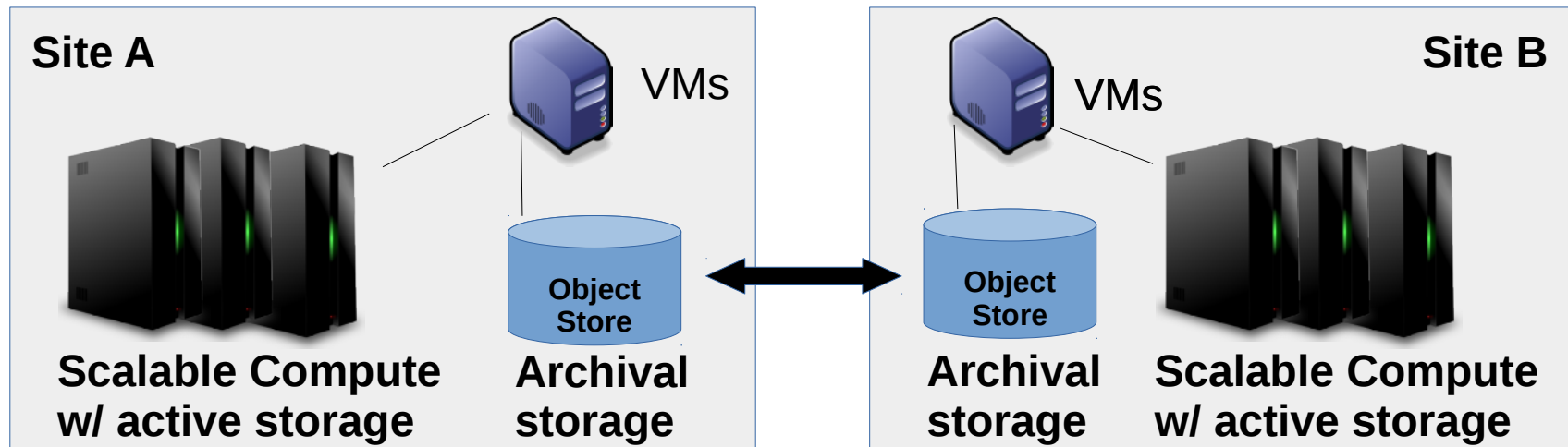


Federated User and
Resource Management



UIs, community portals

Platform services
(Common AAI, Data location service, Data transfer service, APIs)



WHAT IS AVAILABLE TODAY



- CSCS already offers resources as part of FENIX
 - 116344 node*hours on Piz Daint Multicore
 - 186150 node*hours on Piz Daint Hybrid
 - 250 TByte POSIX and Object Store
 - 750 TByte Tape library
 - 1551 TByte*day low latency storage tier

GETTING ACCESS



- Send 2-3 page proposal to icei-coord@fz-juelich.de
- ICEI will perform a technical review
- HBP Directorate will decide on awarding the resources
- ICEI will make resources available
- For more information visit the Fenix Collab:

<https://collab.humanbrainproject.eu/#/collab/28520>

SUMMARY

- HPAC platform
 - Federated infrastructure for HPC, data and VM-based services
 - Access from community portals like HBP Collaboratory
 - Co design approach: scientists and infrastructure need to talk to each other
- Fenix / ICEI
 - Simplify access to resources
 - Provide a federated object store with publishing and sharing capabilities
 - Better interface HPC with services running on VMs