



# EUDAT

## Towards a pan-European Collaborative Data Infrastructure

Martin Hellmich

IT-GT-DMS section meeting 17.9.2012



# EUDAT Core Service Areas

## Community-oriented services

- Simple Data Access and upload
- Long term preservation
- Shared workspaces
- Execution and workflow (data mining, etc.)
- Joint metadata and data visibility

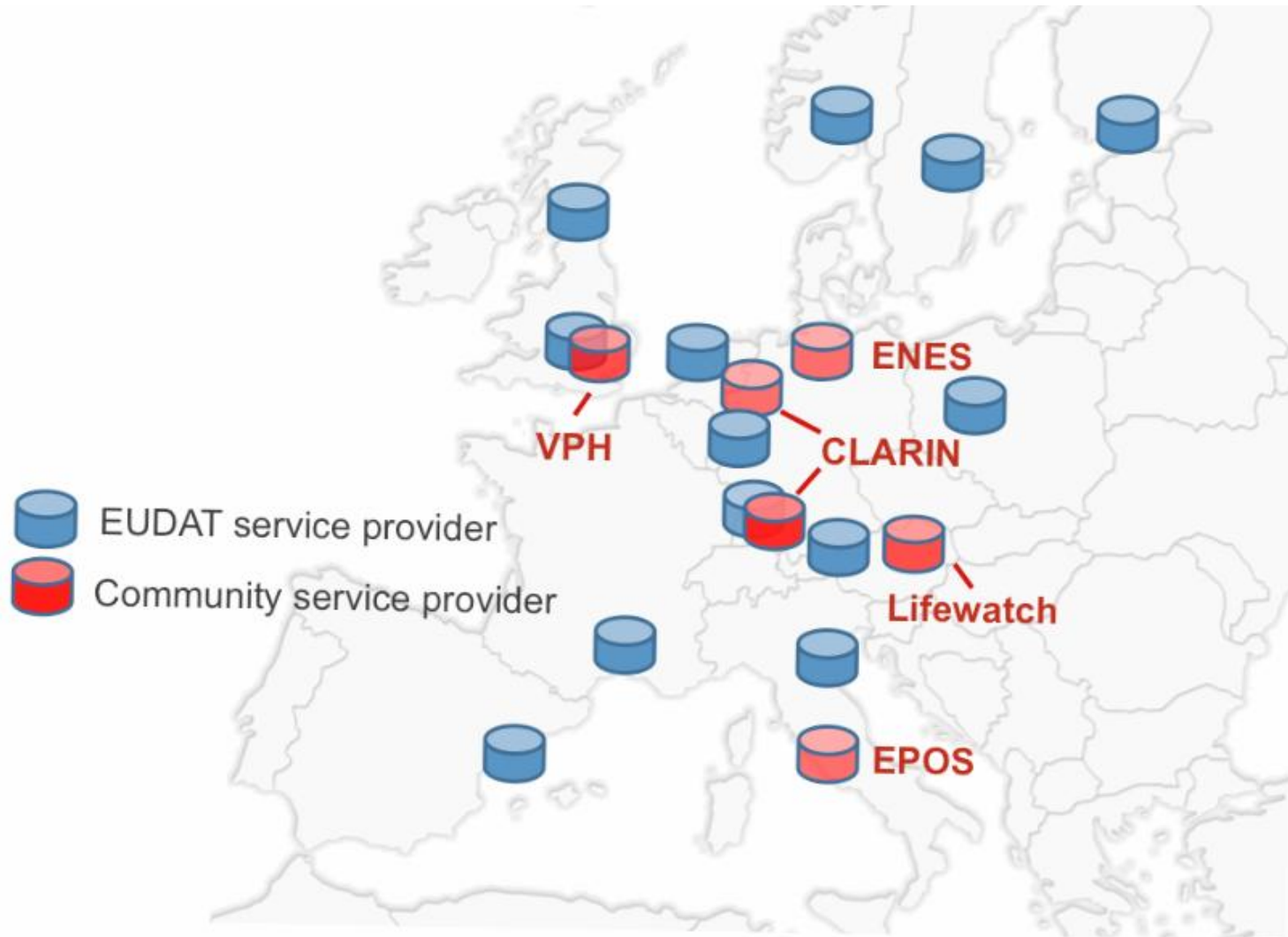
## Enabling services (making use of existing services where possible)

- Persistent identifier service (EPIC, DataCite)
- Federated AAI service
- Network Services
- Monitoring and accounting

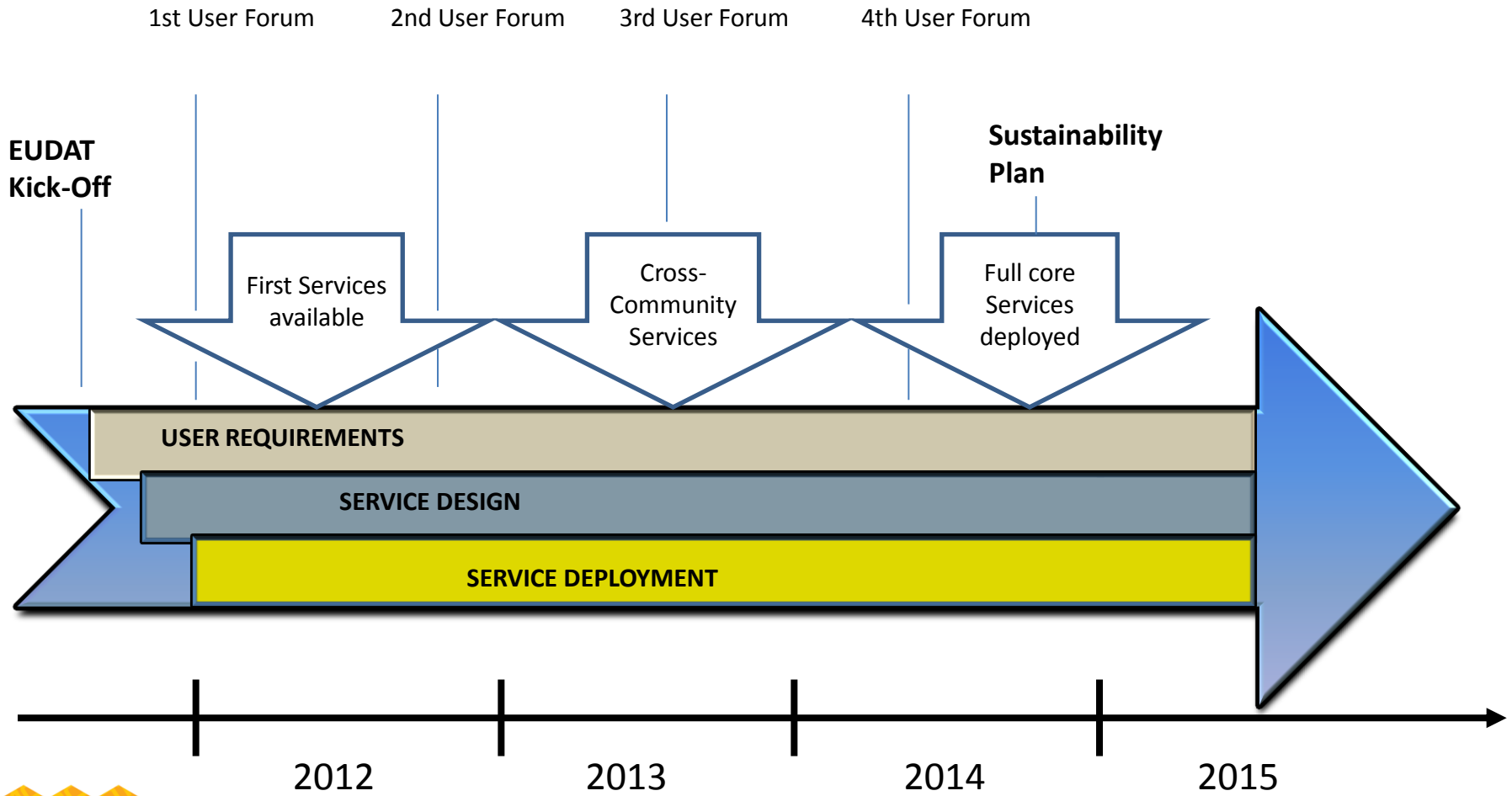
**Core services are building blocks of EUDAT's Common Data Infrastructure**  
mainly included on bottom layer of data services



# INFRASTRUCTURE



# EUDAT Timeline

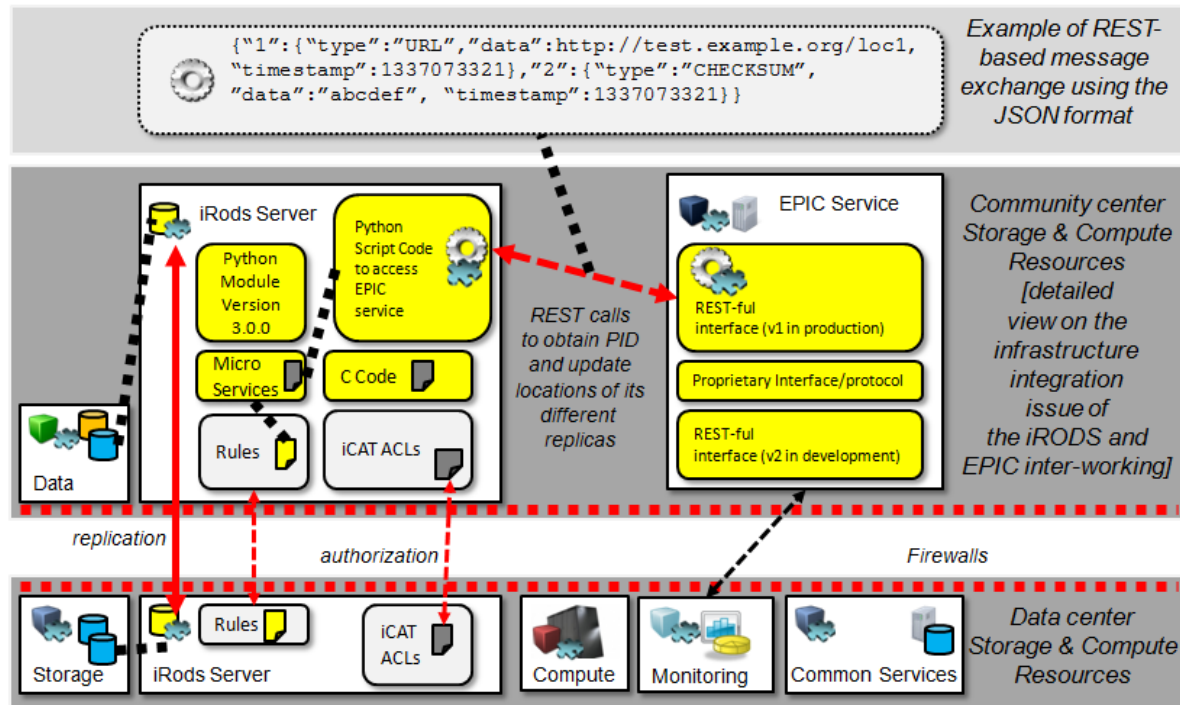


# First Service Cases: Task Forces

- **November 2011: shortlist of 6 service/use cases identified**
  - **Safe replication:** Allow communities to safely replicate data to selected data centers for storage and do this in a robust, reliable and highly available way.
  - **Dynamic replication:** Perform (HPC) computations on the replicated data. Move (part of) the safely replicated data to a workspace close to powerful machines and move the results back into the archives.
  - **Metadata:** A joint metadata domain for all data that is stored by EUDAT data centers by harvesting metadata records for all data objects from the communities. Allow to have a catalogue to demonstrate what EUDAT stores, and to have a registry which can be used for automatic operations such as data mining.
  - **Research data store:** A function that will help researchers mediated by the participating communities to upload and store data which is not part of the officially handled data sets of the community.
  - **AAI:** A solution for a working AAI system in a federation scenario.
  - **PID:** a robust, highly available and effective PID system that can be used within the communities and by EUDAT.

# Safe Replication

- Includes PID service → EPIC Handles
- All iRODS based

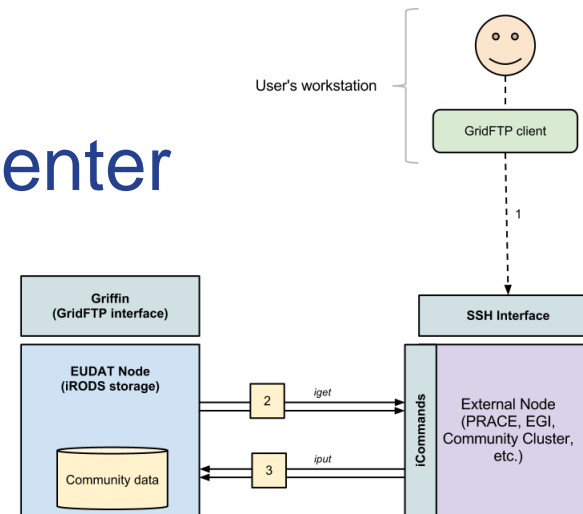


# Data Staging

- gridFTP on top of iRODS (griffin), Globus online
- XSEDE and FTS under evaluation

```
prompt$ ./datastager.py -p /home/irods/data/archive -y 2004 -n MN -s AQU -c  
BHE -u cin0641a --ss ingv --ds GSI-PLX --dd /shared/data/userprace/tmp
```

- Stage within computing center



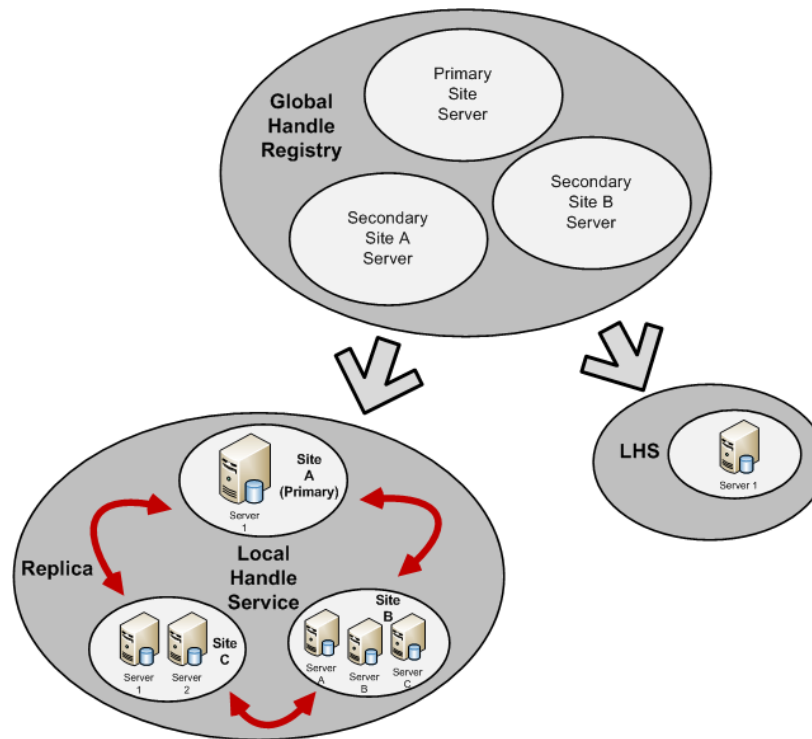


Requirements mapping							
	Griffin	UNICORE FTP	FTS	Globus Online	Parrot	iRODS + iCommands	gTransfer
	Functional						
Capability to stage entire directory	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stage large data sets without big performance penalty	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Search mechanism	N.A.	N.A.	N.A.	Yes	N.A.	Yes	No
Multi-point transfers (i.e. from many sources to one destination)	N.A.	N.A.	No	No	N.A.	No	Yes
API	Yes	No	No	Yes (beta)	No	Yes (Jargon, PyRords)	No
Automatic deletion of staged data sets	No	Unknown	No	No	Unknown	Yes	No
Compatibility with GridFTP (to permit interaction with PRACE)	Yes	Yes	Yes	Yes	Yes	No	Yes
Support for X.509 credentials	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Non-functional						
Ease of use	N.A.	Good	N.A.	Very good	Medium	Medium	Medium
Support for third-party transfers	Yes	Yes	Yes	Yes	No	Yes	Yes
Possibility to tune network parameters	Manual	No	Manual	Automatic	Manual	No	Semi-automatic
Compatibility with iRODS	Yes	No	Through Griffin	Through Griffin	Through Griffin	Yes	Through Griffin
Transfer restart/resume	Yes (only for third-party)	No	Unknown	Yes	No	No	Yes (only for third-party)
Ability in managing many transfers simultaneously	No	No	Yes	Yes	No	No	No



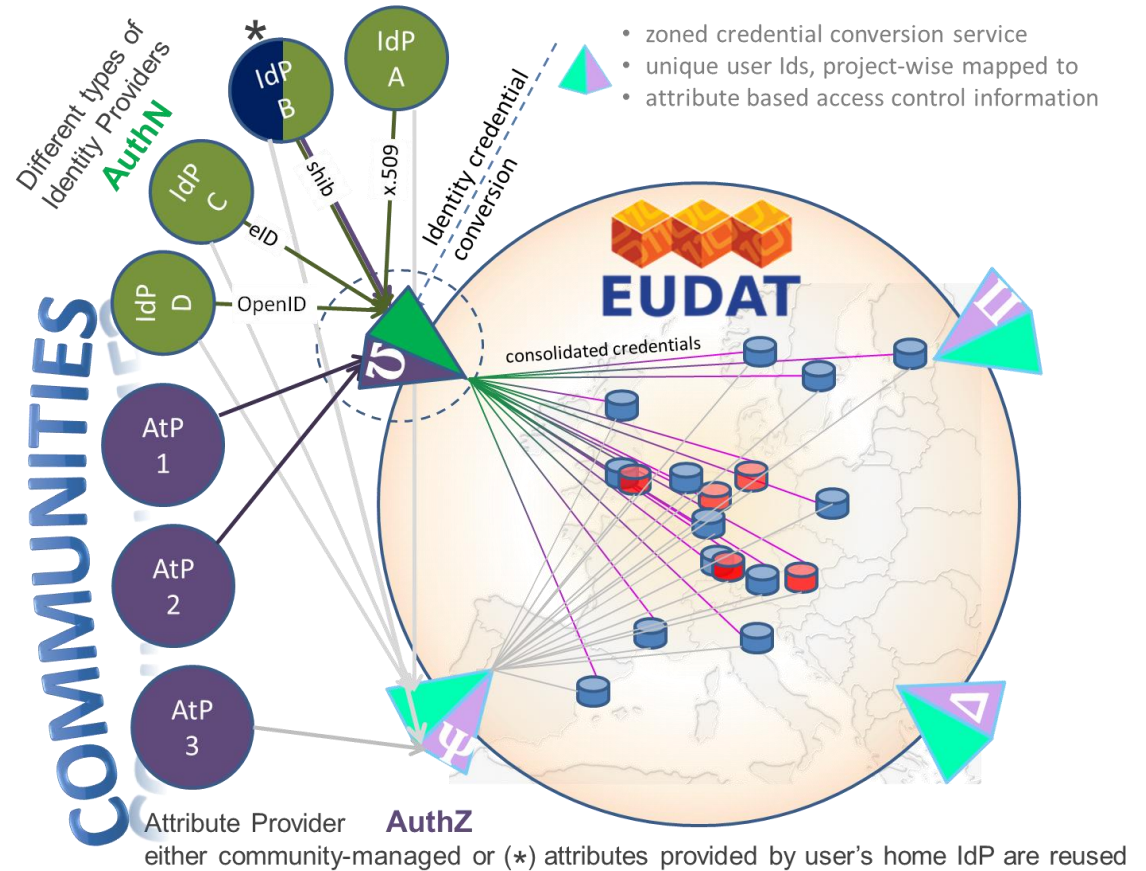
# Handle System

- EUDAT as LHS
- EPIC and DataCite



# Federated AAI

- Use existing infrastructure
- OpenID, Shibboleth, SAML, Contrail
- Trusted CAs
- Technologies under discussion



# Metadata

- Technology not final
- All metadata is open
- Some weak quality constraints
- Federated Search
- XML-based
- Community-extendable
  
- No new inventions

# Simple Store

- Test installation of Invenio on the way

# iRODS continued

- Local storage or on disk servers (dpm-like)
- Extended for PIDs
- Federations with synchronization and PIDs
- Mounted collections – no metadata
- Compound resources (S3, ...)
  - Need cache class with POSIX

# Our Stuff – Deliverable

- Deliverable April 2013
  - “Evaluation of existing interfaces to data archives, roadmap for evolution towards a standard”
  - Eval of data landscape, eval of community needs, definition of Gaps, proposal of a solution

# Our stuff – Data Access Projects

- iRODS data caching (start soon)
- Data pre-processing on storage elements (start soon)
- Simple data access – providing POSIX
  - Parrot and gfaFS
- Web-based 3<sup>rd</sup> party transfer (start soon)
  - FTS3
- Federating Cloud Storage (start soon)
  - iRODS and OpenStack
- DPM S3 (almost done ;)
- LHC experiment dynamic data replication eval.





# Thank you!

- Questions are welcome 😊
- Not shown: 7.1.1 Scalability tests