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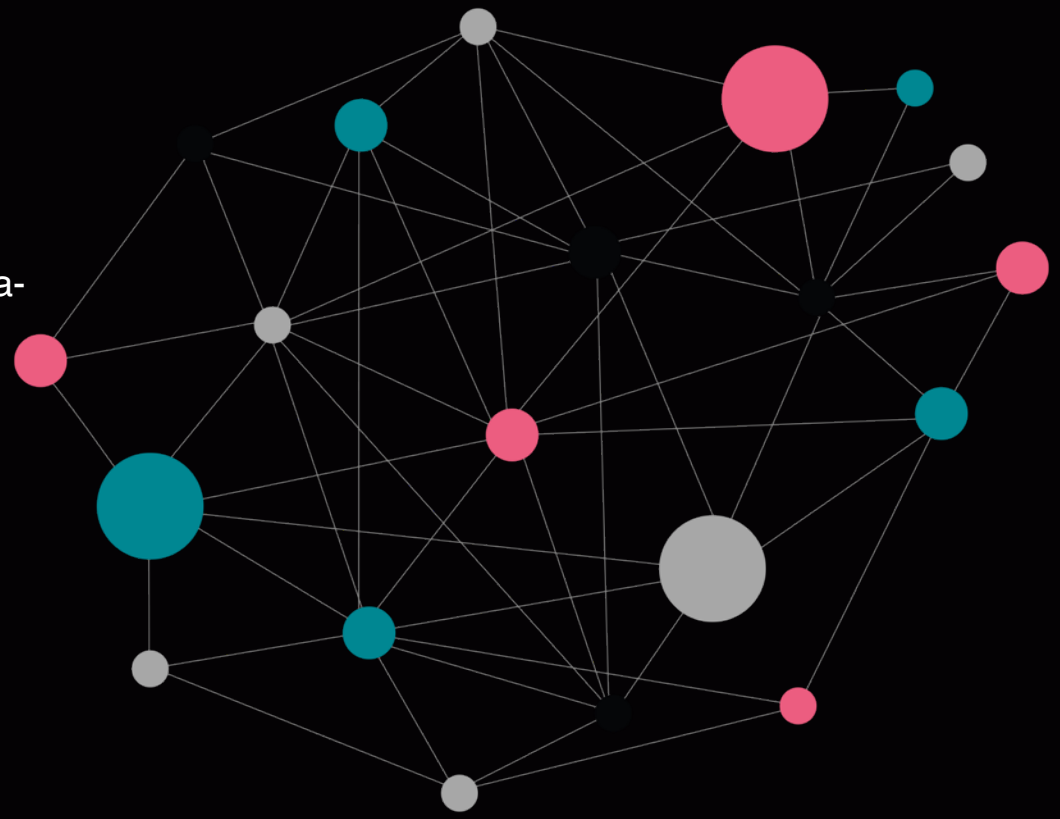
Practical aspects of the EOSC (Technical) Interoperability Framework

EOSC PL Journey

Roksana Wilk · ACC Cyfronet AGH

EOSC Symposium 2026, Florence · EOSC Federation IF, architecture and data-related policies



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Technical Interoperability - from principles to practice

One of four layers of the EOSC Interoperability Framework

Technical	**Semantic**	**Organisational**	**Legal**

1 Conceptual level

Enabling independent systems and services to work together across the EOSC Federation

2 Technical level

Implementation of common interfaces, protocols and operational mechanism

Goal: Enable EOSC Nodes and their services to operate as a federated ecosystem, providing seamless access to distributed resources while preserving the autonomy of participating organisations.

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What does it mean?

Conceptually

- Collaboration across organisational boundaries
- **Seamless access to distributed resources**
- Federation rather than centralisation
- Common capabilities supporting cross-node operations

Technically

- Federated Authentication & Authorization (AAI)
- Resource discovery and federated catalogues
- Standard interfaces and APIs
- Compliance with EOSC interoperability guidelines

EOSC Handbook: EOSC Association. (2026). EOSC Federation Handbook (Version 2.0). EOSC Association. https://doi.org/10.5281/zenodo.18454649

Technical interoperability in the EOSC Federation and initial gap analysis: Scardaci, D. O., Dimper, R., Wilk, R., Gonzalez Guardia, E., Portier, M., & Van de Sanden, M. (2025). Technical interoperability in the EOSC Federation and initial gap analysis. Zenodo. https://doi.org/10.5281/zenodo.17507570

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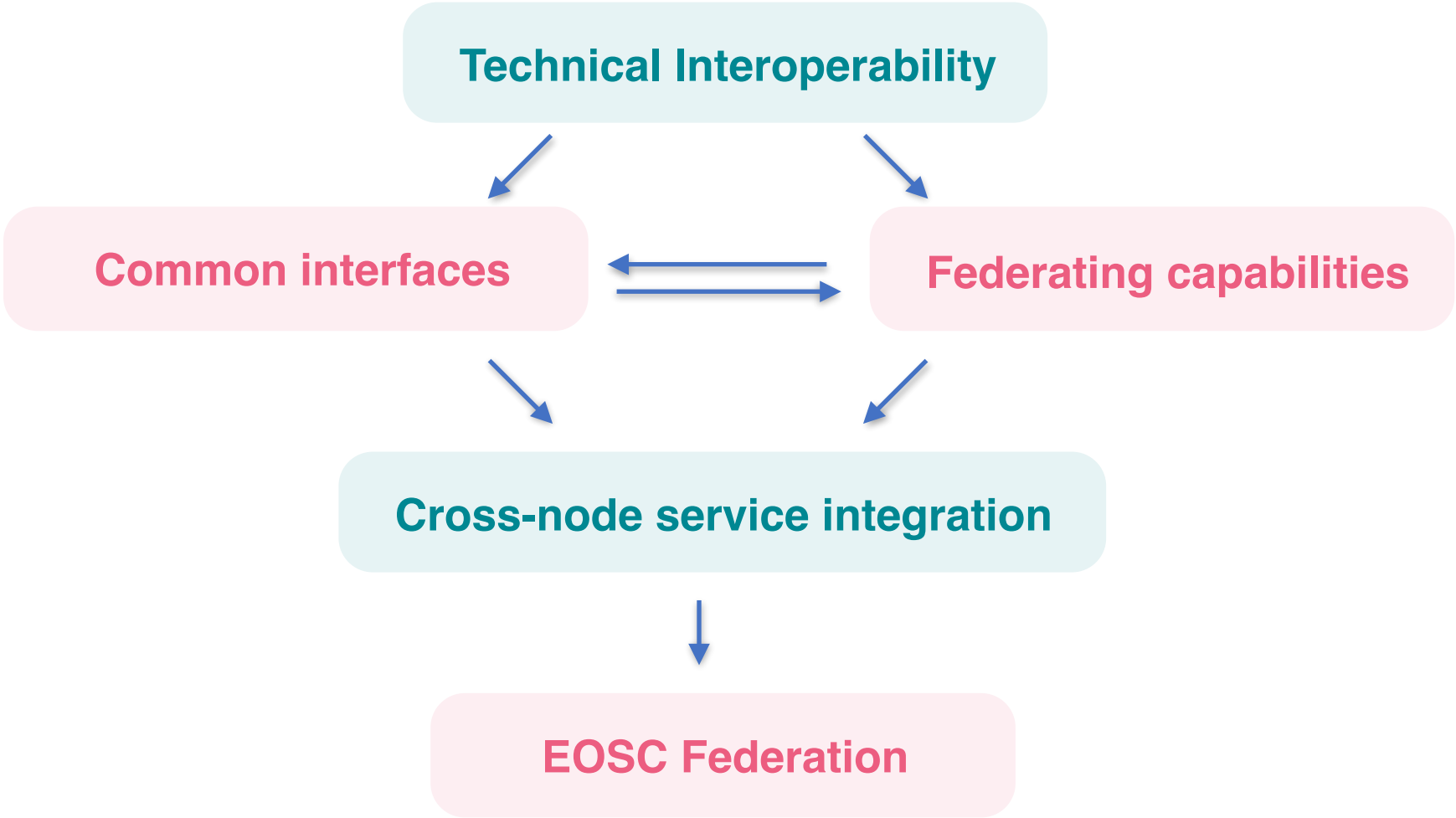
What does it mean?



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Technical interoperability is achieved through Federating Capabilities

From the EOSC Federation Build Up Phase

1 AAI

Enables researchers to use a trusted digital identity to access services and resources across multiple EOSC Nodes.

2 Research Product Catalogues

Expose and discover research outputs through interoperable metadata and catalogues.

3 Service Catalogues

Provide a unified view of services available across EOSC Nodes.

4 Helpdesk

Coordinate user support and issue resolution across federated services.

5 Service monitoring

Track availability and performance of services throughout the Federation.

6 Service management

Ensure consistent operation, onboarding and lifecycle management of federated services.

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Technical interoperability is achieved through Federating Capabilities

From the Technical Interoperability Taskforce

1 Data & Metadata Interoperability

Make digital assets understandable and interoperable by exposing machine-readable descriptions, conformity information, and interoperability status.

2 Federated Discovery

Enable researchers to discover services, datasets and resources across multiple EOSC Nodes through a federation of interconnected catalogues.

3 Federated Access and Reuse of Services

Provide seamless and consistent access to services across Nodes through shared access policies, interoperable interfaces and machine-composable resources.

4 Federated Compute & Storage for Data Analysis

Bring computation closer to data by integrating distributed storage and computing resources into a unified research environment.

5 File/Data Sync & Share Services

Support secure and seamless sharing of research data across organisations and Nodes through federated file synchronisation and collaboration services.

6 Large-Scale Data Transfers

Enable reliable, scalable and automated movement of massive research datasets between distributed storage and computing environments.

7 AI Tools Supporting Interoperability

Leverage AI to simplify onboarding, improve metadata mapping, enhance discovery and automate interoperability processes across EOSC.

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EOSC PL Core

Functions	Type	Description
Resource Catalogue, Registry services and Marketplace	**Core**	Catalogue with a search engine to discover, access and order services and research products from providers
AAI	**Core**	AARC Blueprint compliant AAI enabling access to Node services via federated credentials (community AAI and Infrastructure Proxy)
Helpdesk	**Core**	Support incident response and service requests for services and other integrated resources
Service Monitoring	**Core**	Check the status, availability and reliability of services
Service and Research Product Accounting	**Core**	Track and record usage of resources
Access Management	**Core**	A framework for providers to define offers and a unique interface for end-users to request access to resources
Configuration Management System	**Core**	Shared space to store information on monitoring, accounting and helpdesk of services to ensure consistent performance (only for internal use)
Execution Framework	**Core**	Deploy applications on compute and storage resources

Functions	Type	Description
Data Transfer	**Horizontal**	Enable the transfer of data between different storage locations
Interactive Notebooks	**Horizontal**	Support interactive data analysis
Compute and storage resources (including middleware)	**Horizontal**	Compute and storage resources to support data analysis with relevant middleware (e.g. support for containers)

Core functions of the EOSC PL Node

Feasible implementation plan until Oct'25

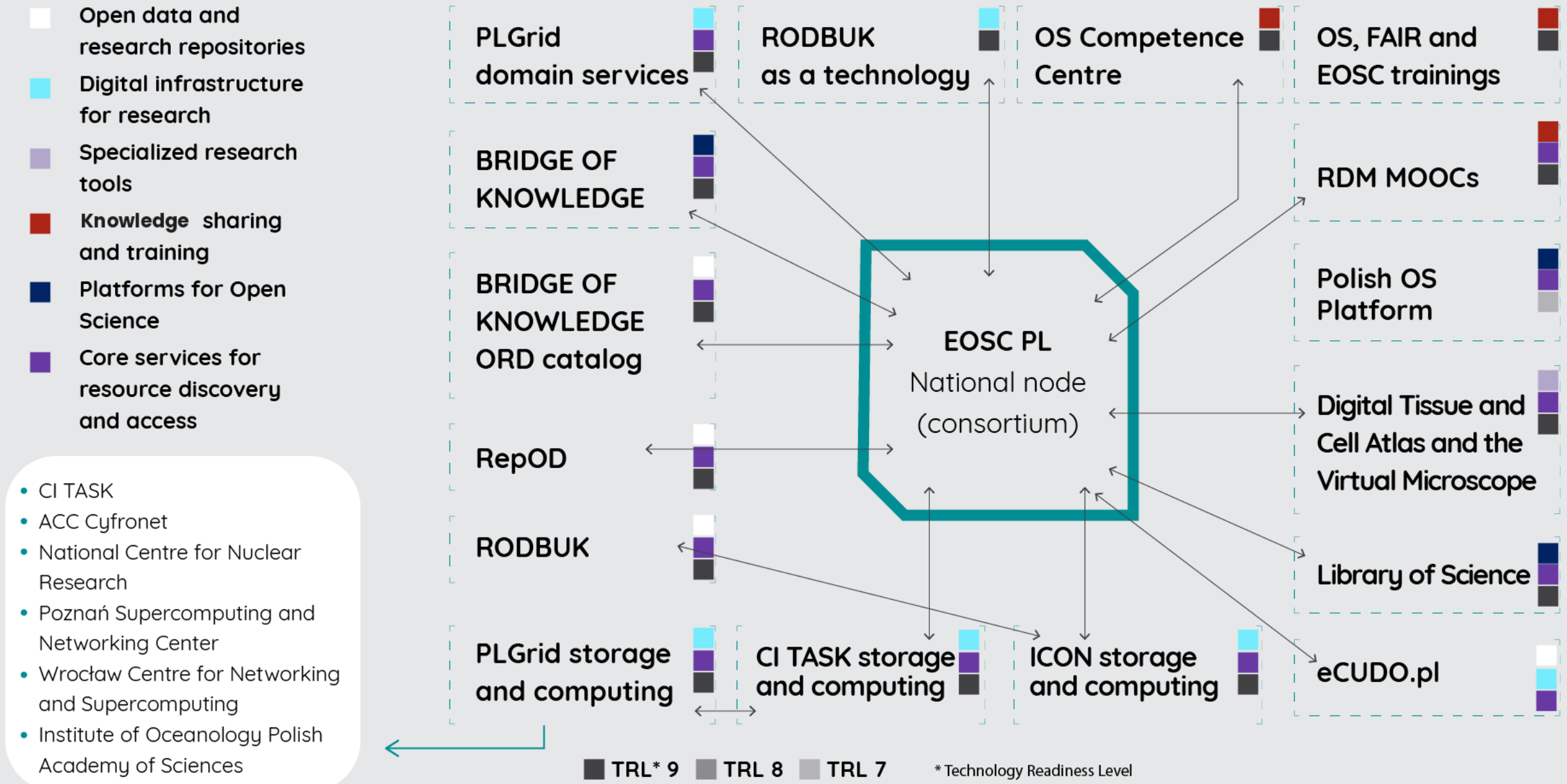
Federated on the Node level. Ready to federate in EOSC

Technicaly ready to federate in EOSC. Needs to align policies across node

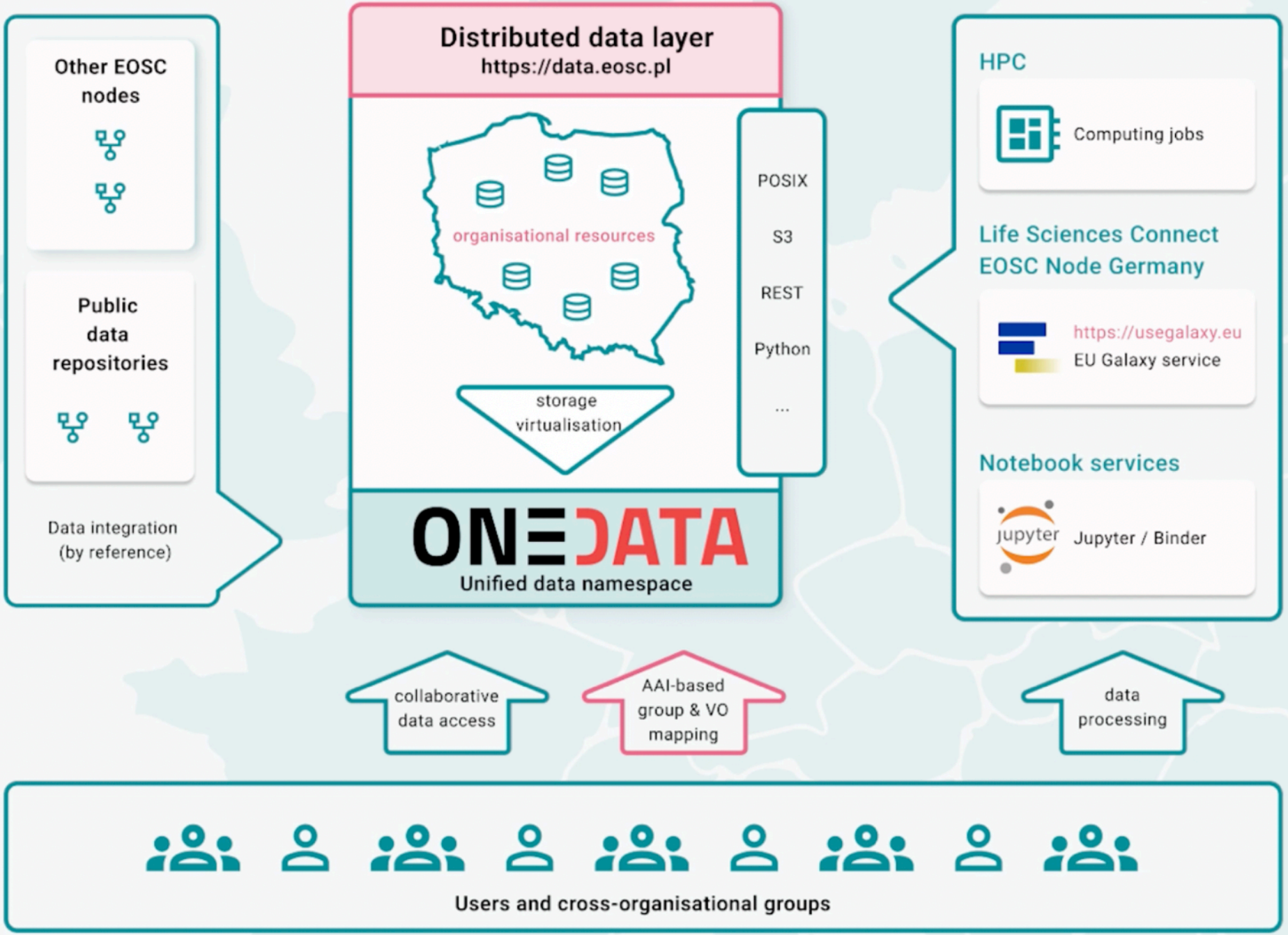
Function existing in the Node. Needs to adapt technically to EOSC and align policies across node

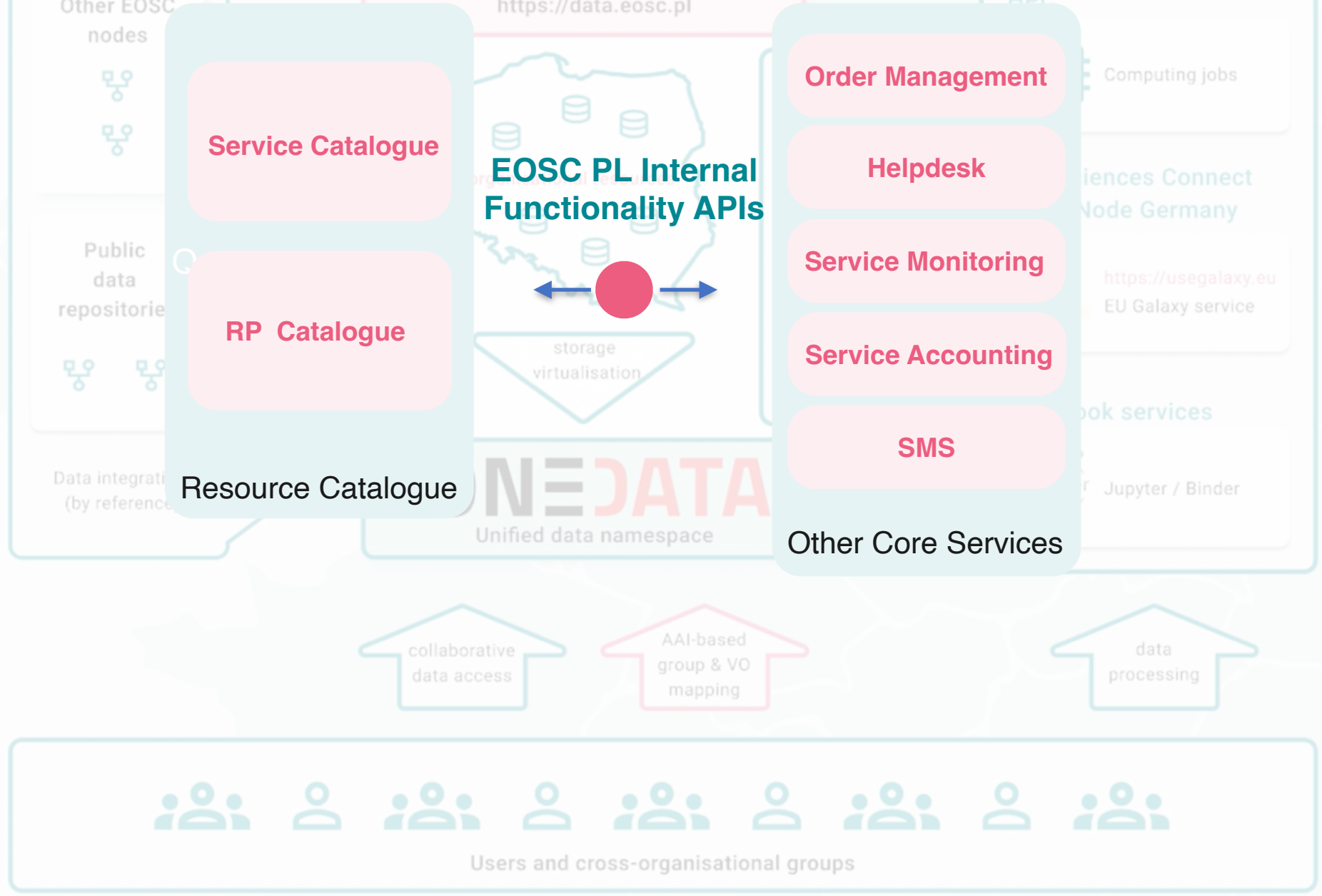
Existing but too complex to implement before October 2025 (possibly a PoC)

EOSC PL Exchange



- CI TASK
- ACC Cyfronet
- National Centre for Nuclear Research
- Poznań Supercomputing and Networking Center
- Wrocław Centre for Networking and Supercomputing
- Institute of Oceanology Polish Academy of Sciences


Other EOSC nodes
Public data repositories
Data integration (by reference)
Distributed data layer
https://data.eosc.pl
organisational resources
storage virtualisation
POSIX
S3
REST
Python
...
ONEDATA
Unified data namespace
HPC
Computing jobs
Life Sciences Connect EOSC Node Germany
https://usegalaxy.eu
EU Galaxy service
Notebook services
jupyter
Jupyter / Binder
collaborative data access
AAI-based group & VO mapping
data processing
Users and cross-organisational groups



Service Catalogue

RP Catalogue

Resource Catalogue

EOSC PL Internal Functionality APIs

Order Management

Helpdesk

Service Monitoring

Service Accounting

SMS

Other Core Services

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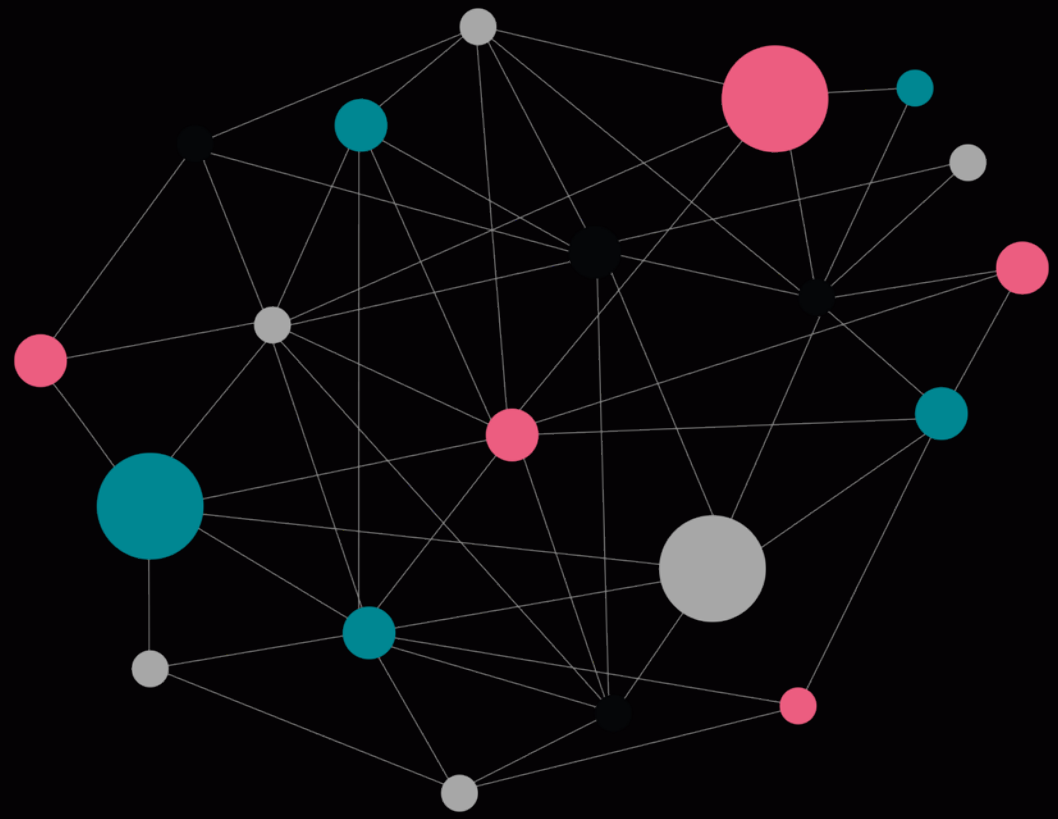
Thank you

Roksana Wilk
roksana.wilk@cyfronet.pl
ACC Cyfronet AGH
EOSC Semantic and Interoperability TF, EOSC PL Tech Lead
ORCID 0009-0006-5321-1006



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