



# Towards a Pan-European Research Storage Infrastructure

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GN5-2 WP4

Data needs protection

Researchers need  
seamless collaboration

Institutions need  
trusted data management

Research infrastructures need  
seamless data exchange

Everybody needs competitive pricing

## Problem statement – for the storage of research data



Storage needs for research data are growing



Datasets are increasing in volume, complexity, and retention requirements



Compliance has become a necessity



Rising user expectations



Sovereignty has regained its importance

## Stated Goals for a Pan-European Research Storage Infrastructure

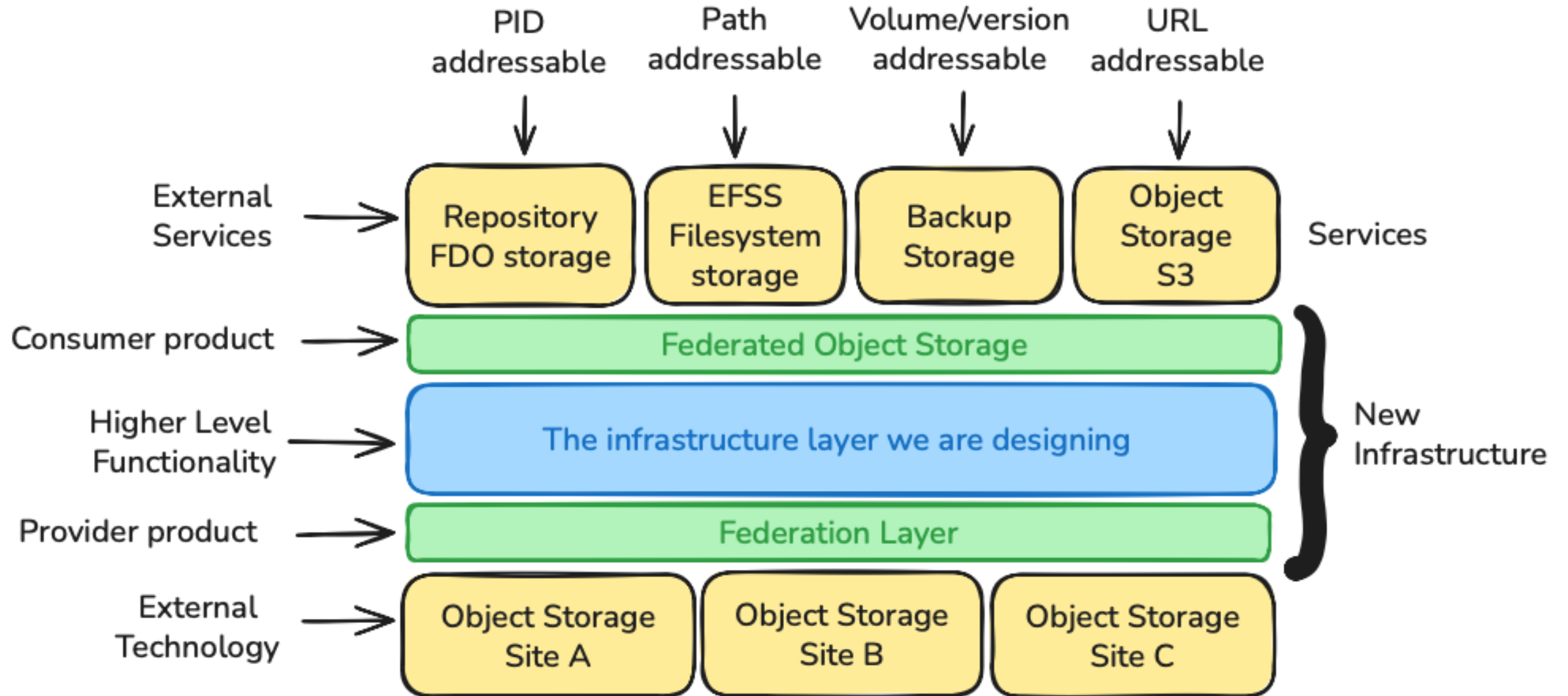
A sovereign, coherent infrastructure for European research

Easy to use as a foundation for other services

Long-term sustainability

Trusted by data controllers

A feasible roadmap



# Infrastructure Design Principles

1

## Build Infrastructure

Infrastructure is a building block for someone else's service

2

## Use Existing Components

Utilise existing standards and components when possible

3

## Cut to the Core

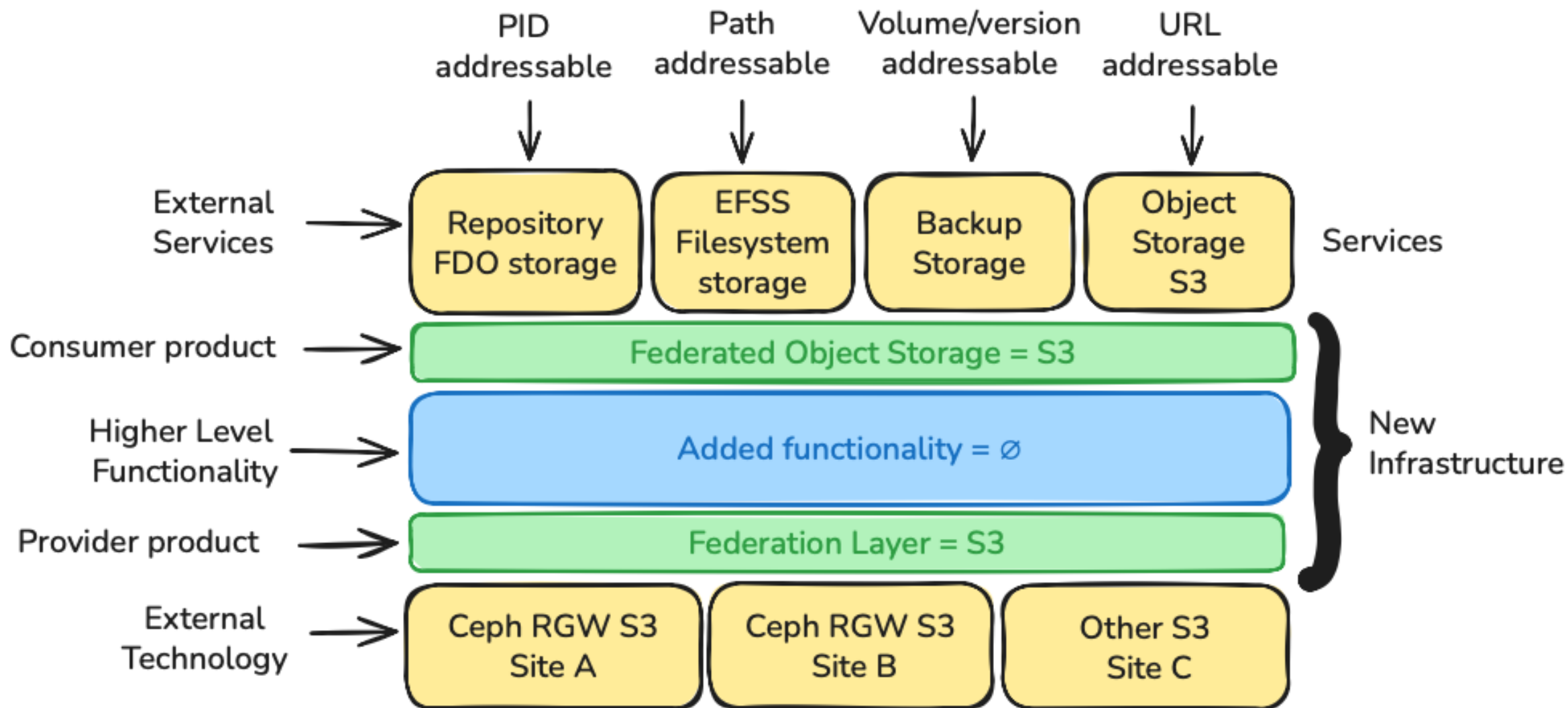
Do not internalise what can be externalised

"Solutions should come from the communities that own the problems"



## Many pieces of the puzzle

- Scalable, highly available storage capacity: Ceph RADOS
  - Ceph Foundation and Ceph Community
- Object storage protocol: S3
  - Ceph Community, SNIA, OIF
  - CS3 Community, Ceph Science Group, EOSC
- Digital Trust and Identity: EOSC AAI, eduGAIN, AARC
  - FIM4R, REFEDS, Tiime
- Object Storage Federation
  - SIG-CISS
- Umbrella federation: EOSC
  - EOSC Federation



## Why do this through GÉANT?



GÉANT is already a **key European federation actor** for research and education



Building a Pan-European Research Storage Infrastructure is not primarily a problem of storage technology. It is a **federation, trust, identity, procurement, governance, interconnection, and operations** problem



GÉANT's sovereign network infrastructure is a **key enabling component** for creating a Pan-European Storage Infrastructure

## Roadmap overview



Foster convergence among providers



Establish cross-site functionality



Introduce higher level functions



Establish a federated service

## Year 1-3 Blueprints for Object Storage

Blueprints for a Ceph Storage Cluster

*Emphasis on:*

**Convergence**

**Compatibility**

**Sustainability**

**Compliance**

## Year 3-5 Higher Level Functions

Higher level functionality

*Emphasis on:*

**Storage Abstractions**

**Data Management**

**Data Release**

**Cross-site Functionality**

## Years 5+ Federation

Federated service

*Emphasis on:*

**Governance**

**Certification**

**Sovereignty**

**Productisation**

## Year 1-3: Blueprints for Object Storage

- Version 1 of a Blueprint document for building an object storage service for research
- A core set of independent but compatible provider sites
- A defined interoperability specification
- A test set against the interoperability specification

## Year 3-5: Higher Level Functions

- A service ecosystem relying on the object storage services
- A growing set of independent compatible sites
- Cross-site functionality between sites
- Data management and data locality awareness
- First cross-border data-replication use cases
- (Version 2 of the blueprint document)

## Year 5+: Federation

- Packaging the ecosystem to a federated service
- Contractual ties between sites
  - Also addressing GDPR, NIS2, and related requirements
- Heavy reliance on other European projects for federating the service
- (Version N of the blueprint document)

## If this sounds interesting...

If you use Ceph

Align with the  
blueprint

If you use other  
S3-compatible  
providers

Prepare for an  
integration  
layer

If you want to  
engage now

Join SIG-CISS



# Towards a Pan-European Research Storage Infrastructure

**Side Meeting: 09:00–12:30 Friday 12 June,**  
Finlandia Hall: Room 25

**GÉANT Clouds: Sovereign Object Storage, OCRE 2024 Framework, and Cloud Sovereignty**

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