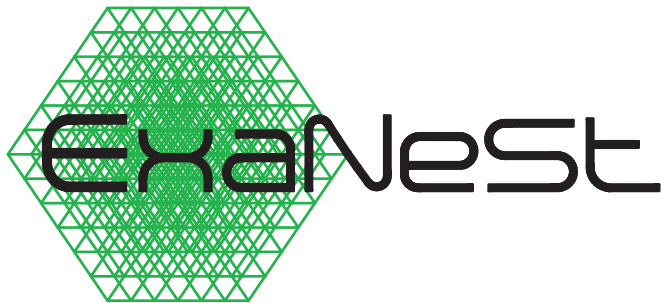# Storage and VOSpace @ OATS
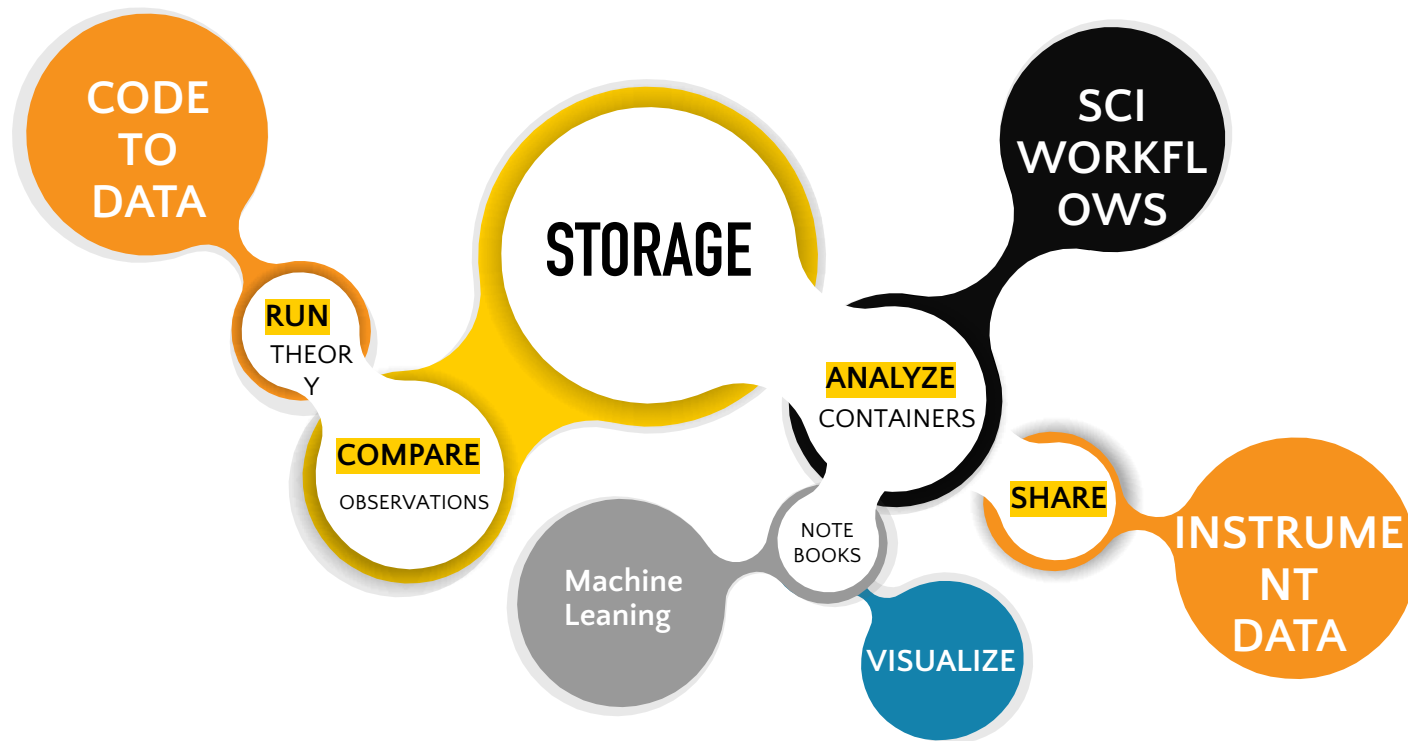
GIULIANO TAFFONI, MARCO MOLINARO, SARA BERTOCCO

IVOA 2018 – 29 MAY 2018 – VICTORIA - CA

Horizon 2020

# Why are we talking about storage

EGI-Engage: EGI CANFAR collaboration

"building an Hybrid Cloud that interconnects the CANFAR cloud infrastructure and the EGI Federated Cloud, both remaining unique entities, [...] bounded together by means of a common authentication model and by the IVOA standards implementation."

- ◉ the Access Control Service
- ◉ the VOSpace service
- ◉ the Credential Delegation Service
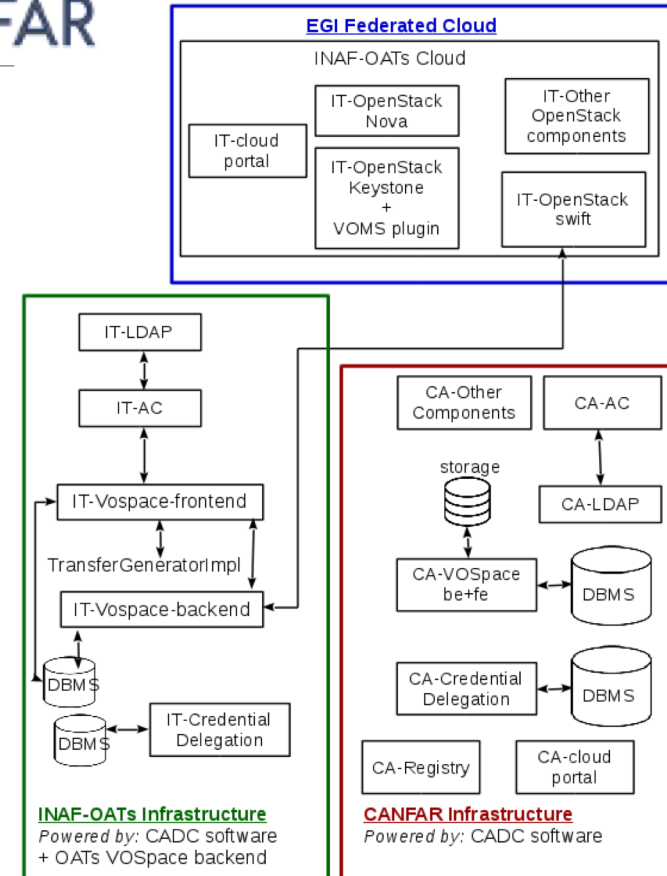
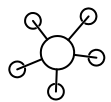**«Cloud access to interoperable IVOA-compliant VOSpace storage», A&C paper**

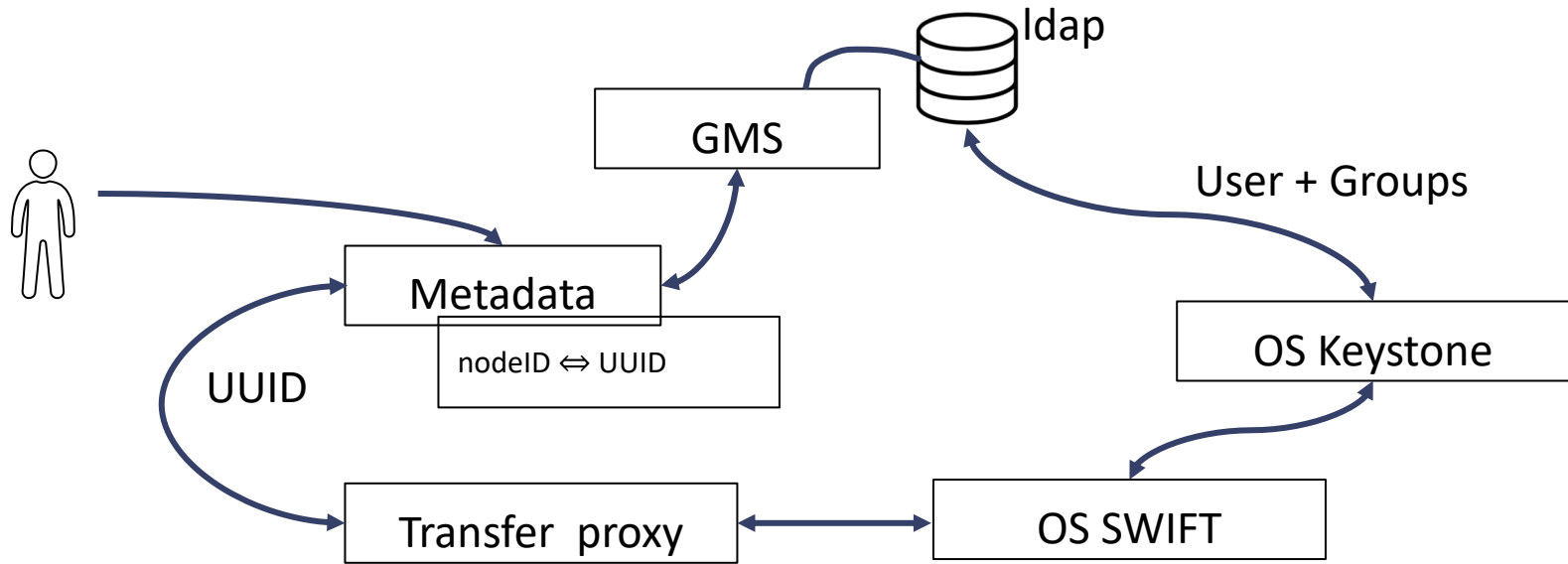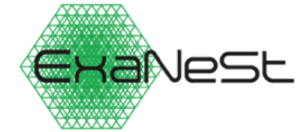# EGI-CANFAR VOSpace implementation
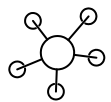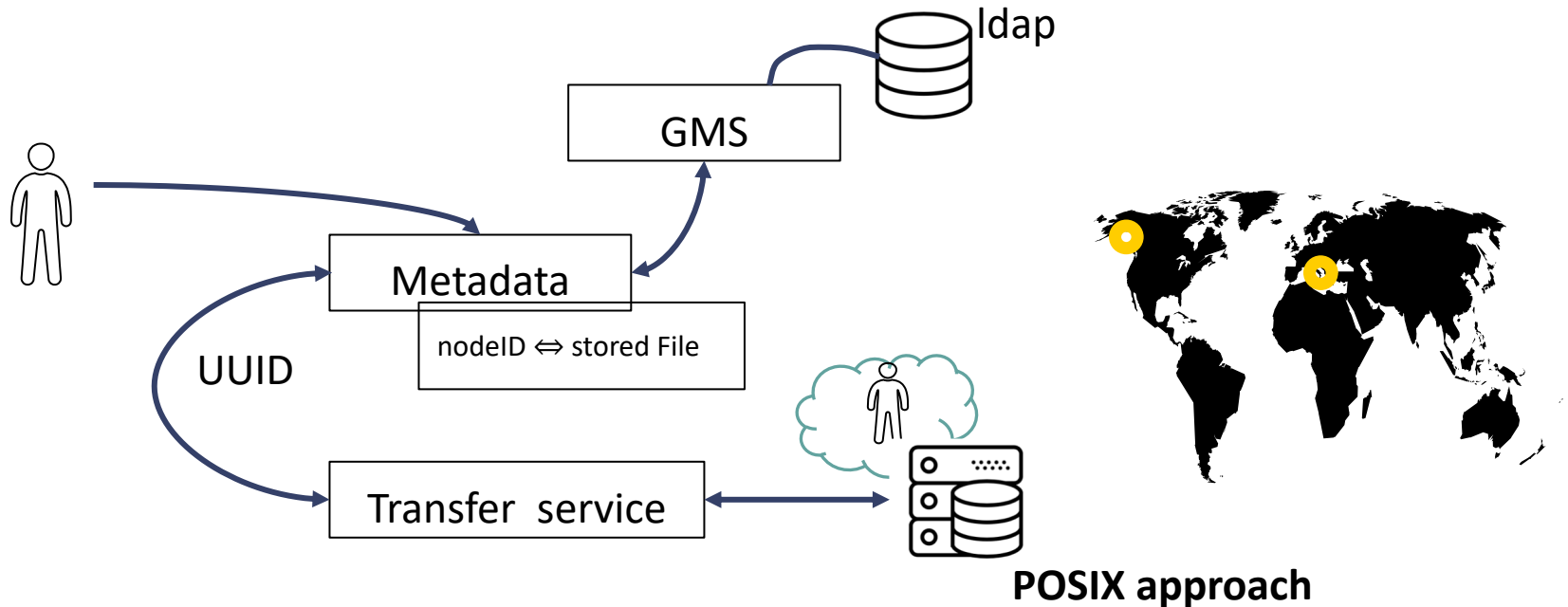
Share data

FUSE mount to make computation but it is slow

EGI-CANFAR VOSpace Cloud implementation

Idap

GMS

Metadata

nodeID ⇔ UUID

UUID

Transfer proxy

OS Keystone

User + Groups

OS SWIFT

Share data

ExaScale Projects

Co-Design

of a ground- breaking platform capable of scaling peak performance to 400 PFlops per **30MW**

CPU

Tape-out of a novel EuroExa **Arm-based** processing unit and integration **FPGA** for prototyping and data-flow acceleration

Interconnect

Novel/unique hybrid, geographically-addressed, low latency high bandwidth switching **interconnect**

Accelerators

A homogenized software platform including **heterogeneous acceleration support**;

Applications

A rich mix of key HPC applications

Storage

Scalable high performance low latency data management based on BeeGFS;
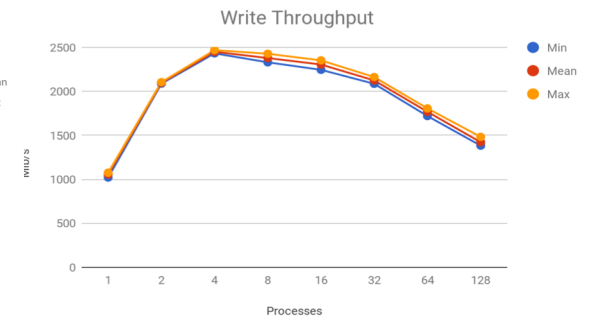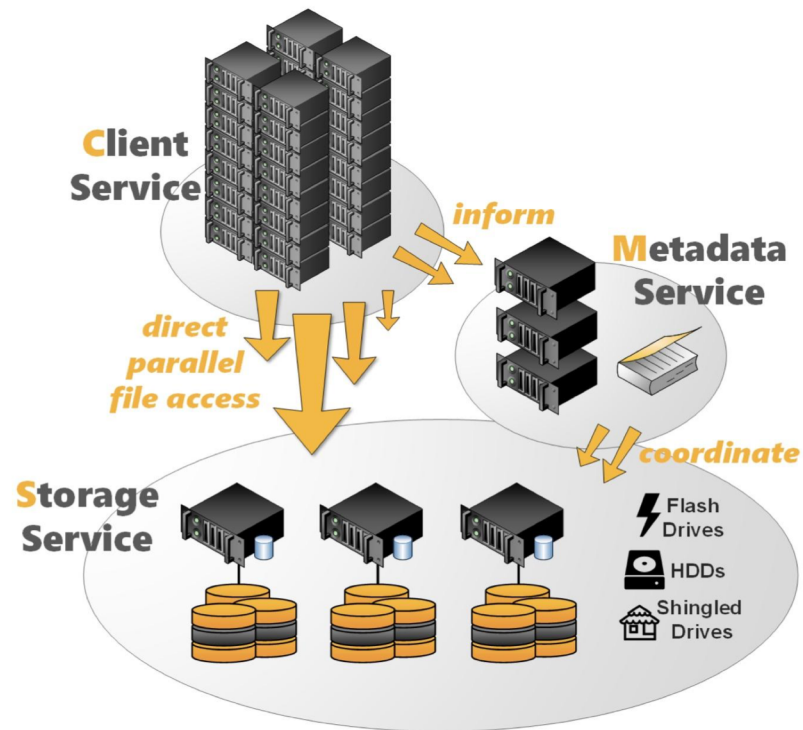
2OMEuro to deployment of a **demonstrator** of a scalable, integrated and operational petaflops level prototype or **400 PFLOPS**.
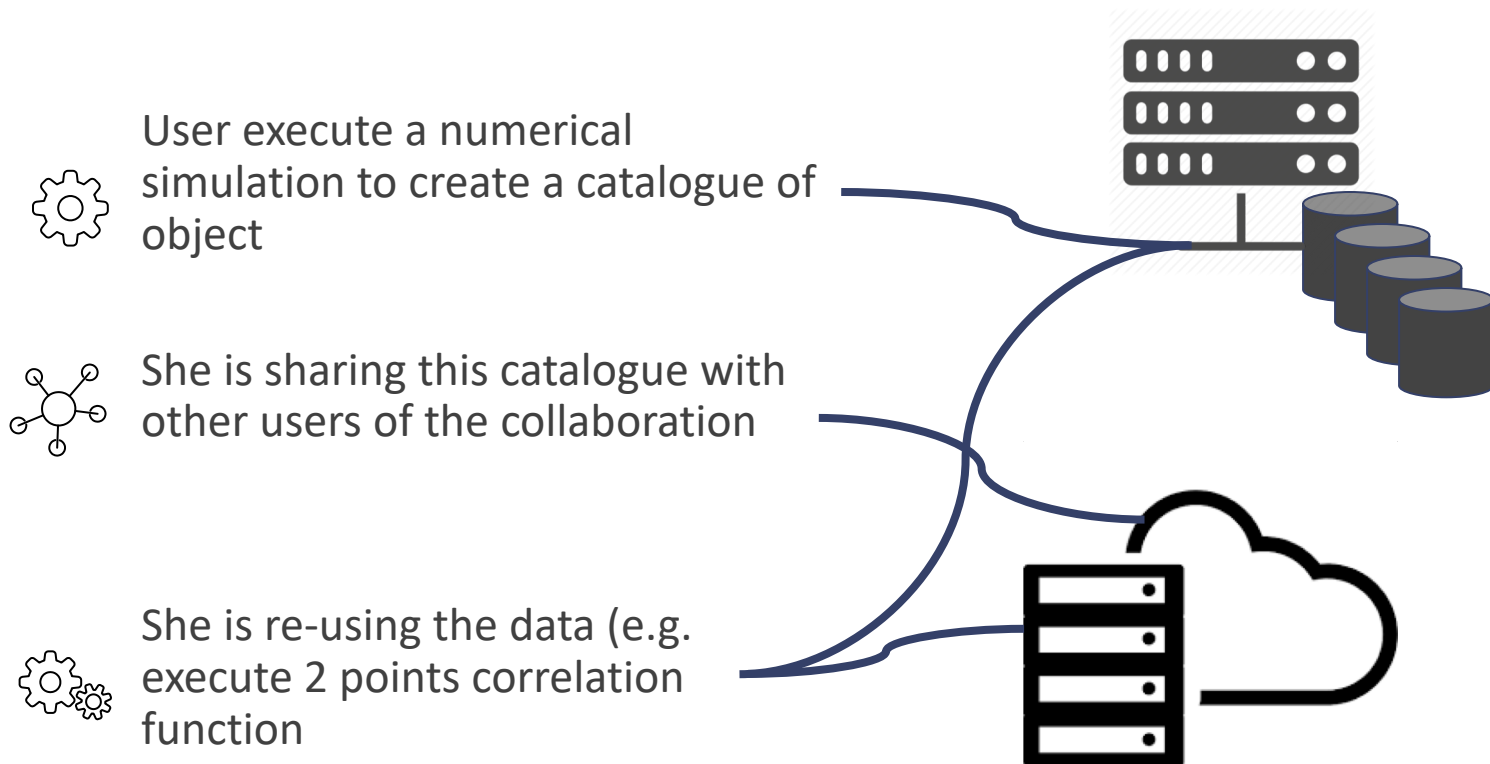
HPC Storage: BeeGFS

Optimized for performance (low latency and high throughput)

Scalable

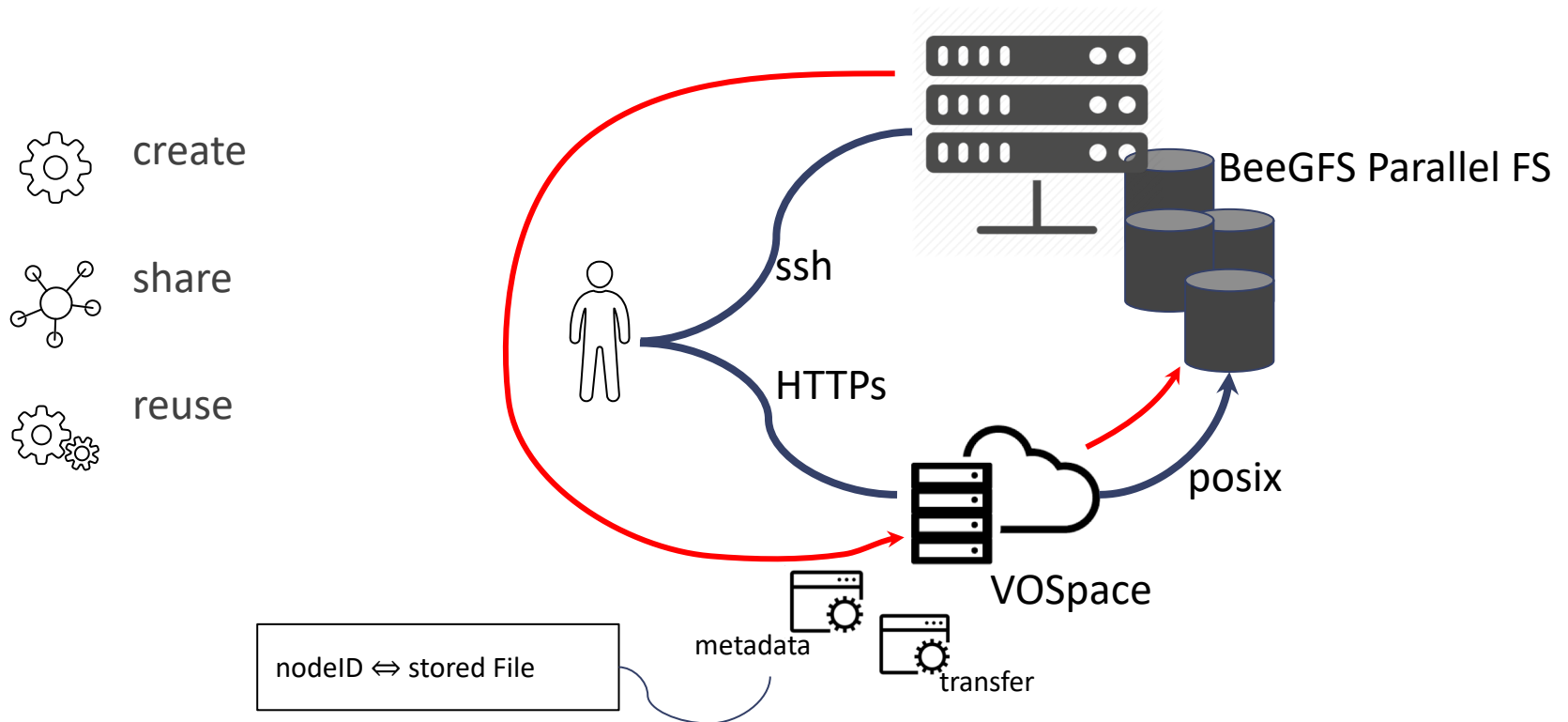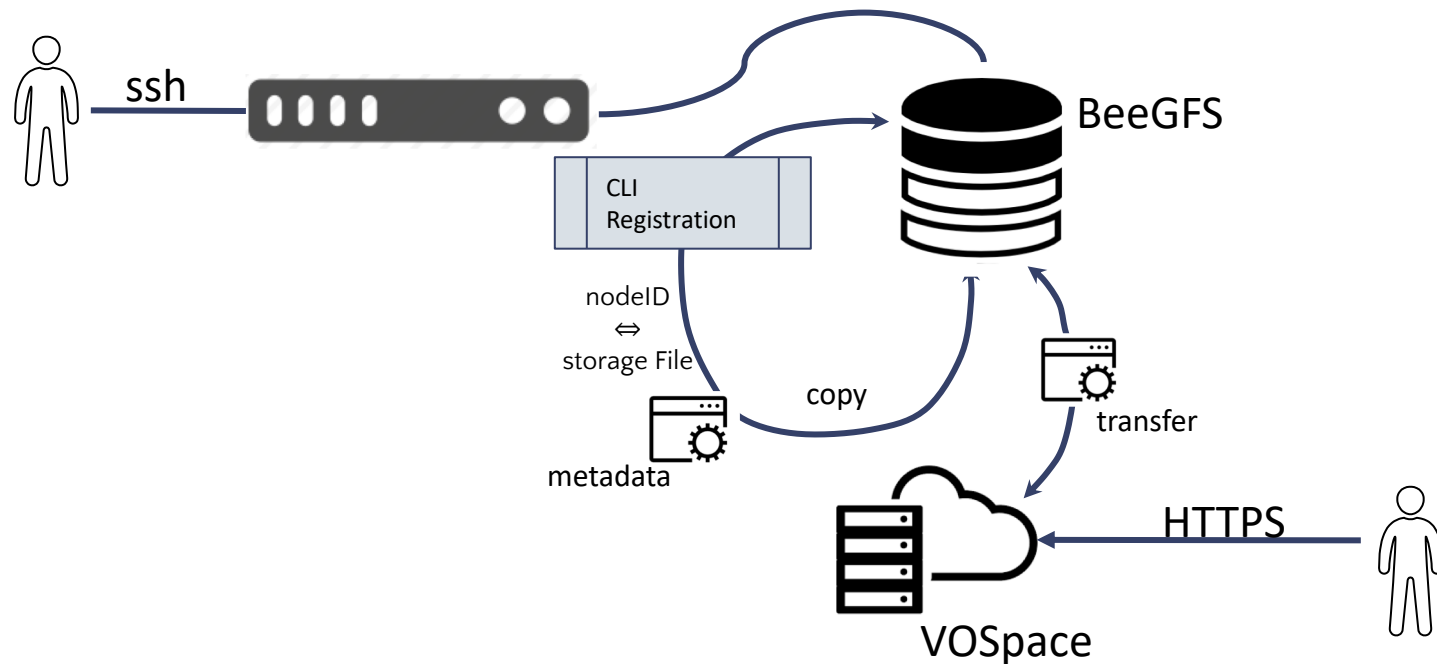**Redundancy on demand**

Use case #2

User execute a numerical simulation to create a catalogue of object

She is sharing this catalogue with other users of the collaboration

She is re-using the data (e.g. execute 2 points correlation function

The standard implementation

create

share

reuse

ssh

HTTPs

BeeGFS Parallel FS

posix

VOSpace

metadata

transfer

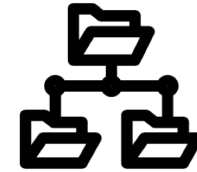nodeID ⇔ stored File
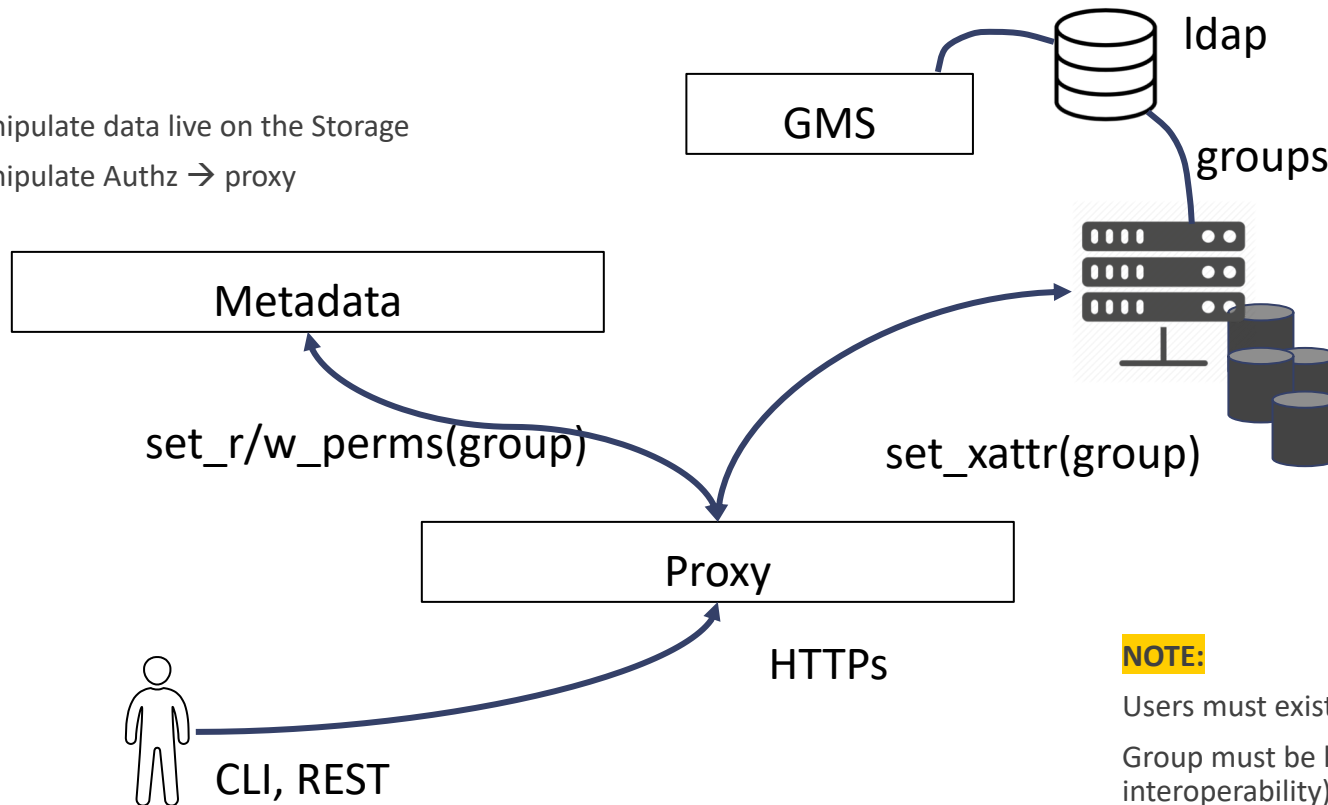
User space != Data space

Userspace == dataspace

How can we share authorizations?

WARNING:

User can manipulate data live on the Storage

User can manipulate Authz → proxy

ldap

GMS

groups

Metadata

set_r/w_perms(group)

set_xattr(group)

Proxy

HTTPs

CLI, REST

NOTE:

Users must exists on my cluster

Group must be local (no "groups" interoperability)

Group must exist on cluster

One GMS over 3 services

CANFAR

GMS

ldap

SWIFT

BeeGFS
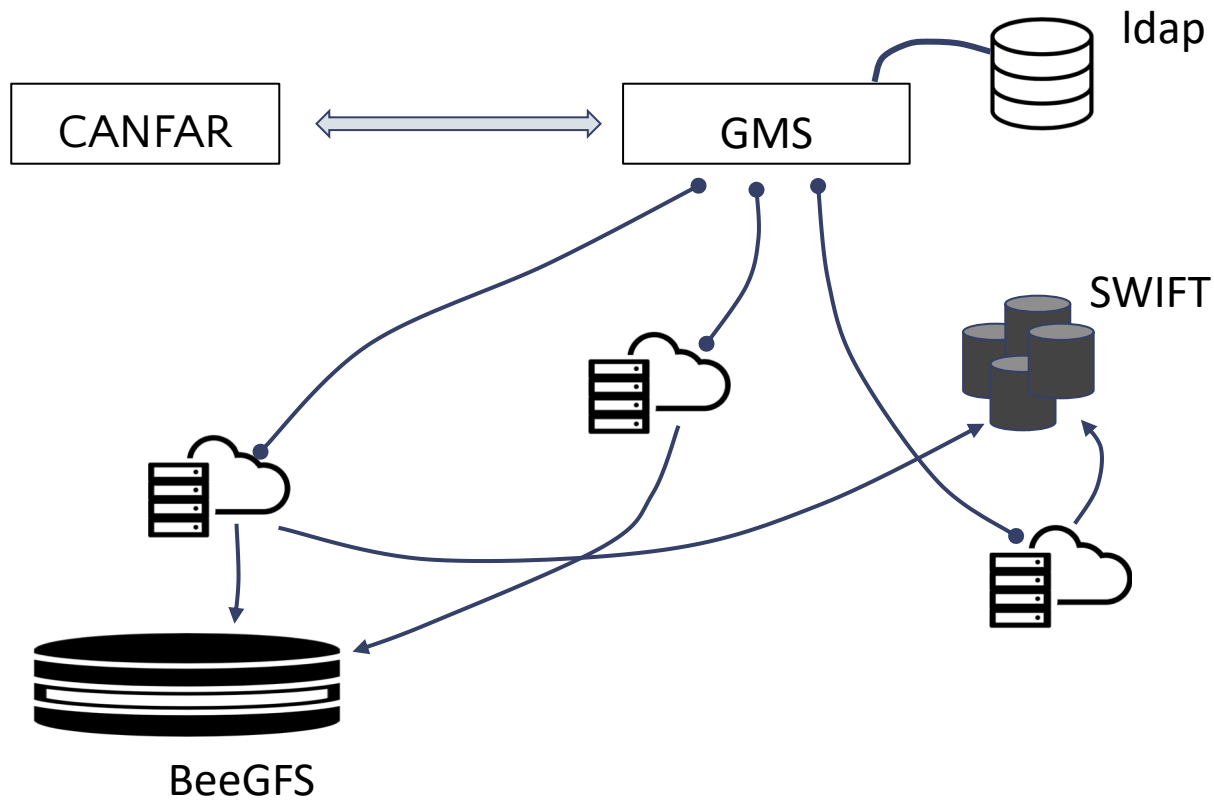
Conclusions

We are experimenting on VOSpace for HPC (and HPCA)

There is not yet a real solution from our side.

New challenges in storage are emerging from scientific needs: data "close" to computing, intelligent multi-tier storage (WAN, LAN, etc)

Object Storage as new HPC and HPDA infrastructure