

# CERNBox Horizon 2030

CERN Site Report

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On behalf of the CERNBox team



# CERNBox

## In a nutshell

Sync and Share



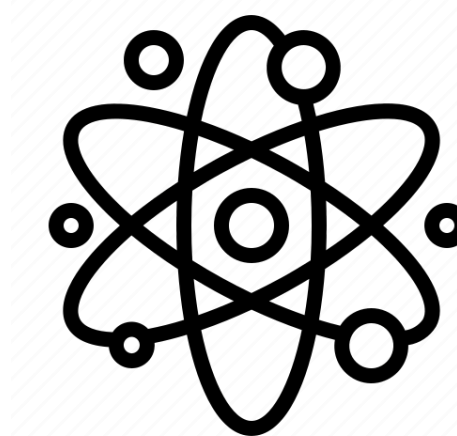
Online file system access



Web apps



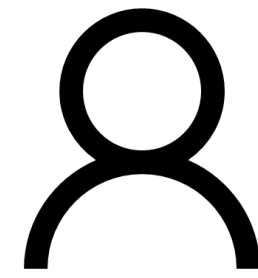
Physics integrations



# CERNBox

## In numbers

- 37k accounts



- 1.6 billion files



- 15 PB data



# Recent focus

## Upwards and onwards

- New infrastructure based on oCIS
  - Global URLs
  - Automatic synchronization of shares and projects
  - Single File Sharing
  - Revamped app integrations
  - Lightweight/Guest accounts
  - Restrictive ACLs
  - RBAC mechanisms



# Major features

# Global URLs

From

[cernbox.cern.ch/index.php/apps/files/?dir=/\\_\\_myshares/Anomaly%20Detection%20\(id%3A405798\)&](https://cernbox.cern.ch/index.php/apps/files/?dir=/__myshares/Anomaly%20Detection%20(id%3A405798)&)

To

[new.cernbox.cern.ch/index.html#/files/list/all/eos/user/j/jcaladov/Documents/Presentations/Anomaly%20Detection](https://new.cernbox.cern.ch/index.html#/files/list/all/eos/user/j/jcaladov/Documents/Presentations/Anomaly%20Detection)

```
[iarora@lxplus783 ~]$ ls -l '/eos/user/j/jcaladov/Documents/Presentations/Anomaly Detection'  
total 774  
-rw-r--r--. 1 jcaladov it 792471 Jul  2  2021 presentation_anomaly_detection.pptx
```

# Automated sync of projects and shares

**WEB**

Home / My Shares

**+ New**

Name ▾

- MALT Coordination**
- ownCloud Roadmap 2021**

**DESKTOP**

Connected to <https://cernbox.cern.ch/cernbox/desktop> as Hugo Gonzalez Labrador (gonzalhu). Account ▾

50 GB of 955 GB in use

- home**  
Synchronizing with local folder CERNBOX
- myprojects**  
Synchronizing with local folder myprojects
- myshares**  
Synchronizing with local folder myshares
  - MALT Coordination (0 B)**
  - ownCloud Roadmap 2021 (0 B)**

```
[root@eoshome-canary-st12 (mgm:master mq:master) ~]$ eos ls -lah /eos/test/reva/users/.shadow/g/gonzalhu/Shares
drwxrws--+  1 gonzalhu it          0 Mar  3 13:40 .
drwxrws--+  1 gonzalhu it          0 Feb  2 11:42 ..
drwxrws--+  1 gonzalhu it          0 Mar  3 13:38 MALT Coordination
drwxrws--+  1 gonzalhu it          0 Mar  3 13:38 ownCloud Roadmap 2021
```



# Improved App providers integration

## Collaborative editing, scientific notebooks, latex projects

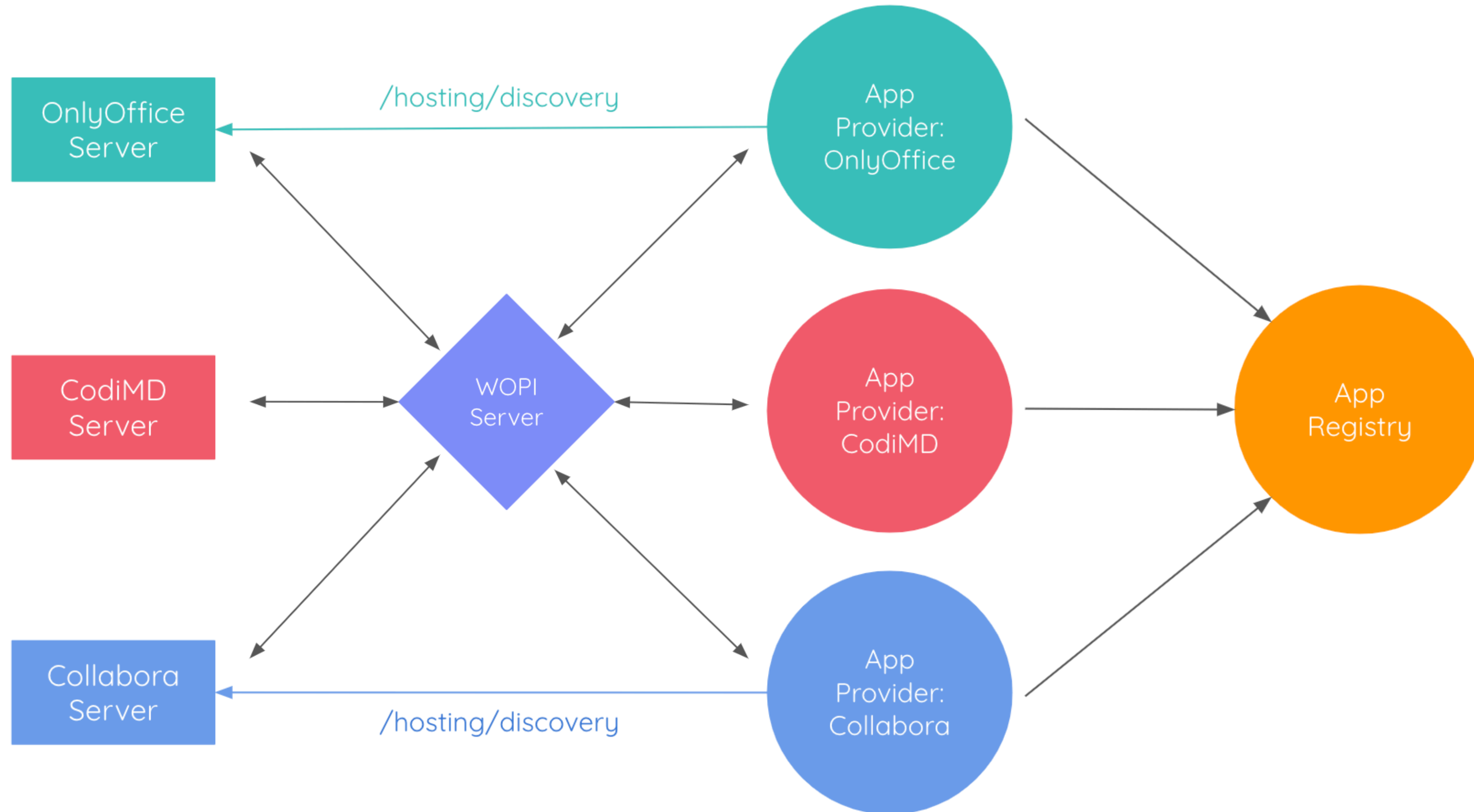
- A pandora's box of applications, right out of the box
  - Office apps
  - Notebooks integrations
  - Visualisation software
  - BYOA!





# Improved App providers integration

## Architecture



# Lightweight accounts

## Why?

- Collaboration at CERN happens across boundaries and institutes
  - Need to share data with such collaborators
- Users currently use public links as a workaround to share data
  - Not scalable
  - No traceability

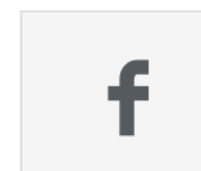
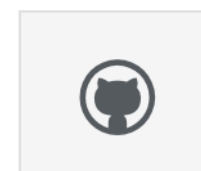
# Lightweight accounts

## The solution

- Allows end users to create lightweight accounts
- Registration via EduGain or social logins

Log in with your social account 



Some social account providers, e.g. Facebook, may use knowledge about your access to CERN for purposes such as profiling.









 **NewFolder**  
3 kB, 5 months ago

[+ Add people](#)

Shared with

 **Ishank Arora**  
(me)  
 Owner

 **Hugo Gonzalez Labrador**  
hugo.gonzalez.labrador@uvigo.edu  
 User  Viewer

 **Samuel Alfageme Sainz**  
samuel@fb.com  
 User  Viewer

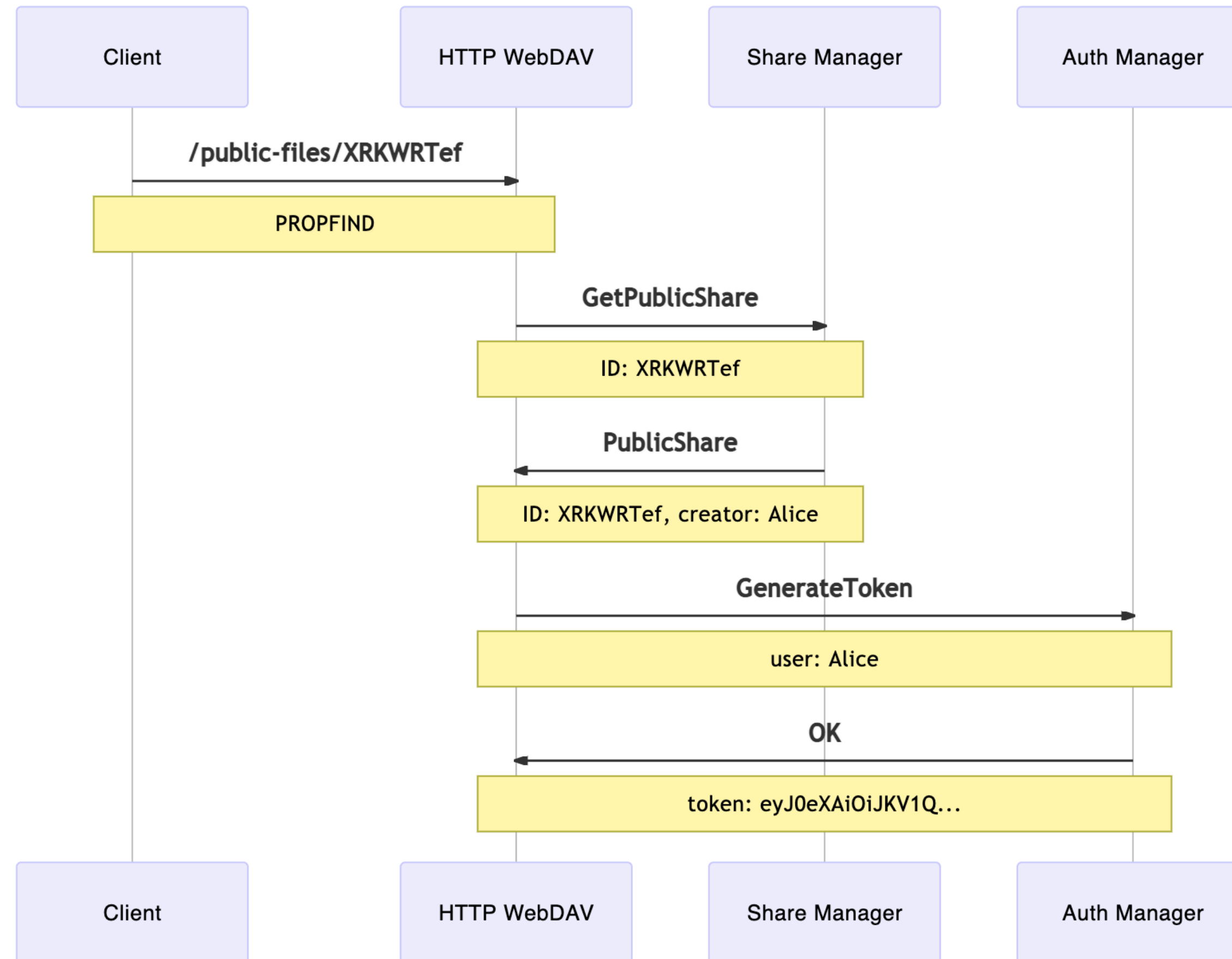
# Denial ACLs

- Deny access to certain group members
- Need for more fine-grained permissions
  - Calls for the concept of Roles!

The screenshot shows a file management interface. At the top, there are navigation options: a back arrow, 'Details', 'People', and a close 'X' icon. Below this, a folder named 'new-configs' is displayed with a blue folder icon, a size of '16 kB', and a modification date of '7 months ago'. A yellow star icon is to the right of the folder name. Below the folder information, there is an 'Invite' section. It features a search bar containing 'HGL Hugo Gonzalez Labrador' with a close 'X' icon. Below the search bar, the text 'Add new person by name, email or federation IDs' is visible. Underneath, there is a dropdown menu labeled 'Invite as deny' with a downward arrow. The dropdown menu is open, showing three options: 'Viewer' (Download and preview), 'Editor' (Upload, edit, delete, download and preview), and 'Deny' (Deny access). The 'Deny' option is highlighted in blue and has a white checkmark to its right.

# RBAC mechanisms

## Why?



# RBAC mechanisms

## Restricting access scopes

- The existing mechanisms posed
  - Security threats
    - Exposing the access token of the creator of a public share
    - Could be utilised by an attacker to access their namespace
  - As well as limitations
    - Third-party app integrations
    - Negative permissions

# Horizon 2030



# Upcoming Integrations

- Data Analysis Platforms
  - SWAN
- Open Data Repositories
  - Invenio
- Collaboration services
  - Indico



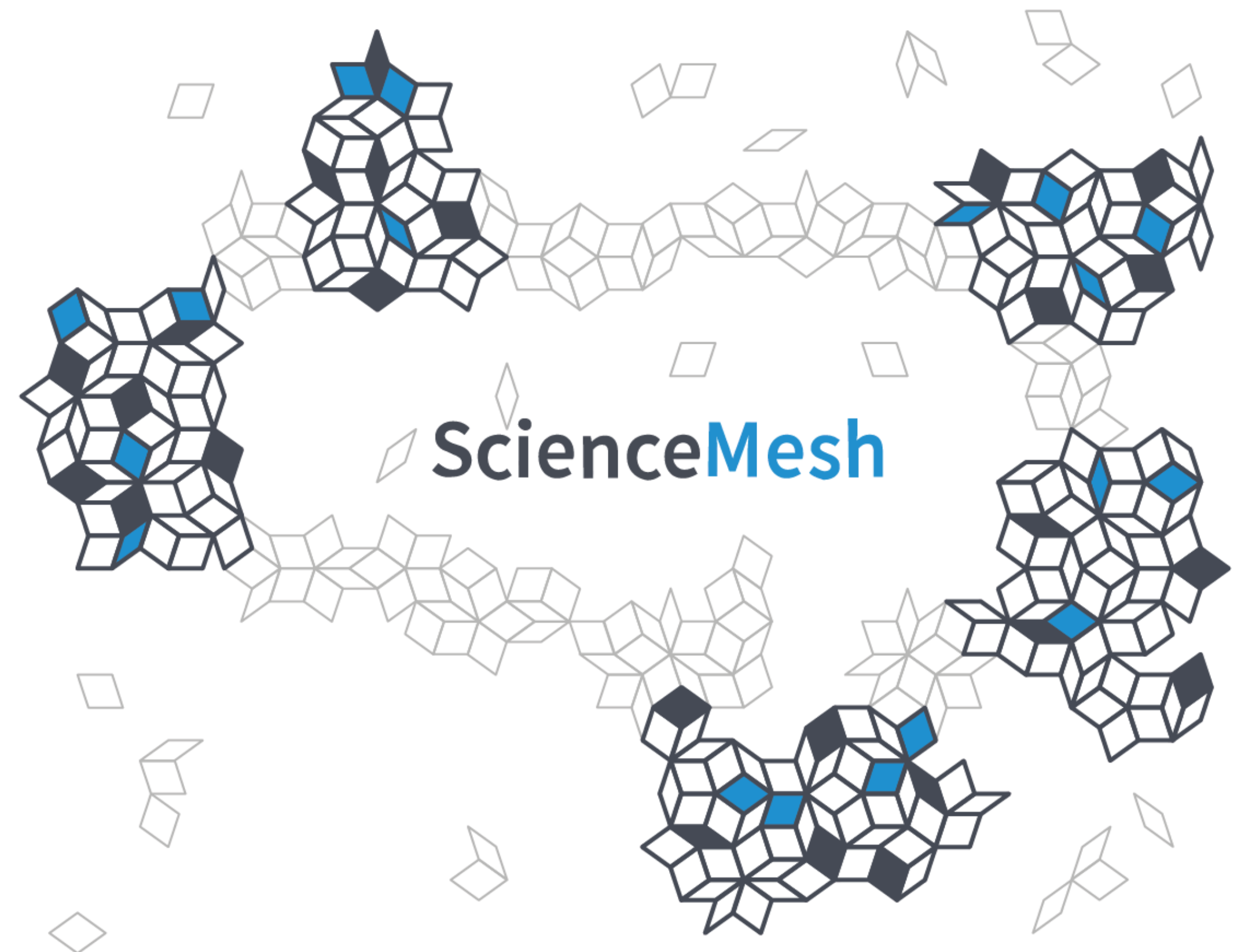
# Custom storage backends

- CephFS as backend for EOS
  - *“Converging Storage Layers with Virtual CephFS Drives for EOS/CERNBox”, Roberto Valverde Cameselle*
- HPC Resource access via separate mounts
  - CephFS mounts
  - S3 mounts

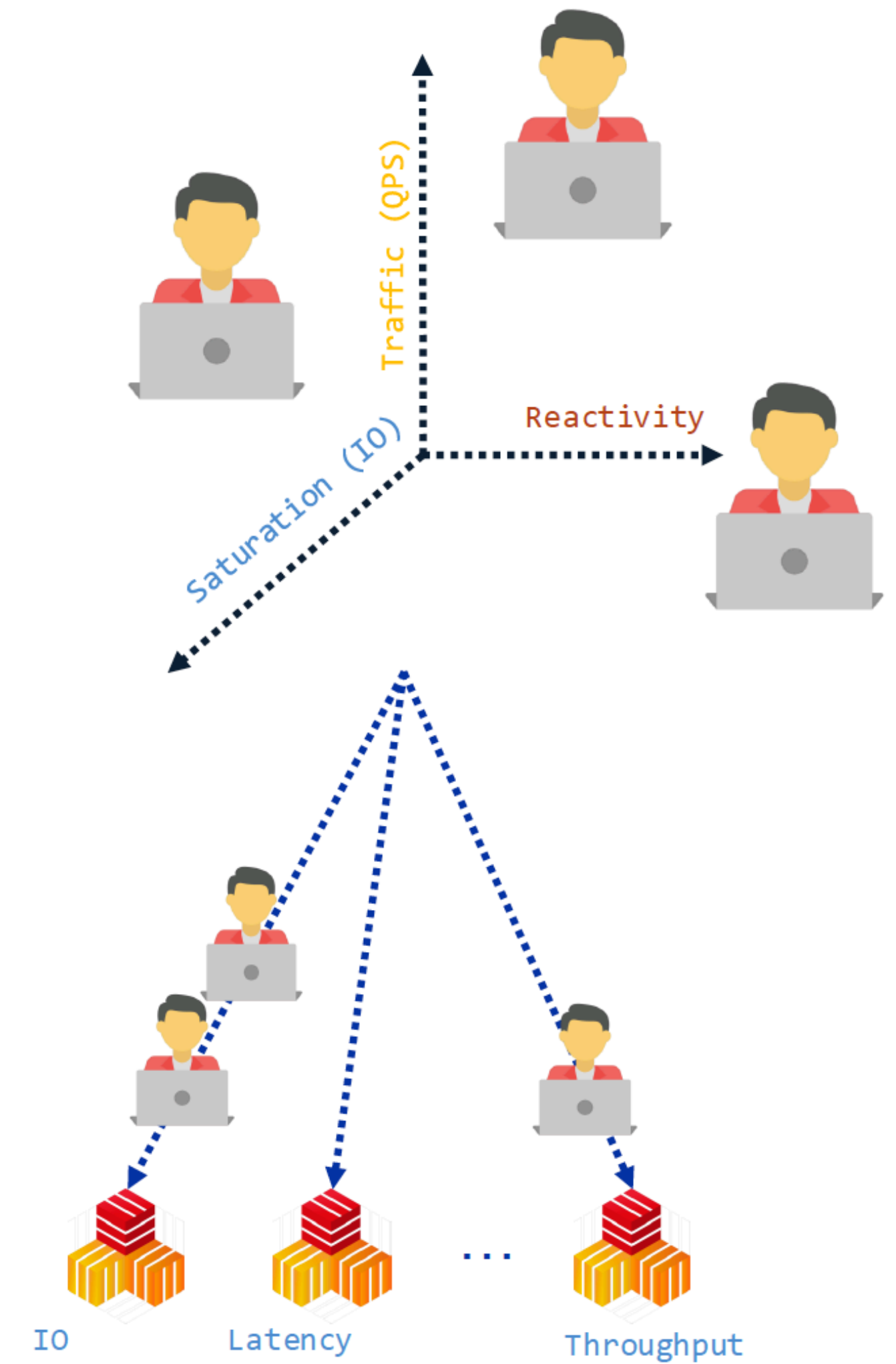
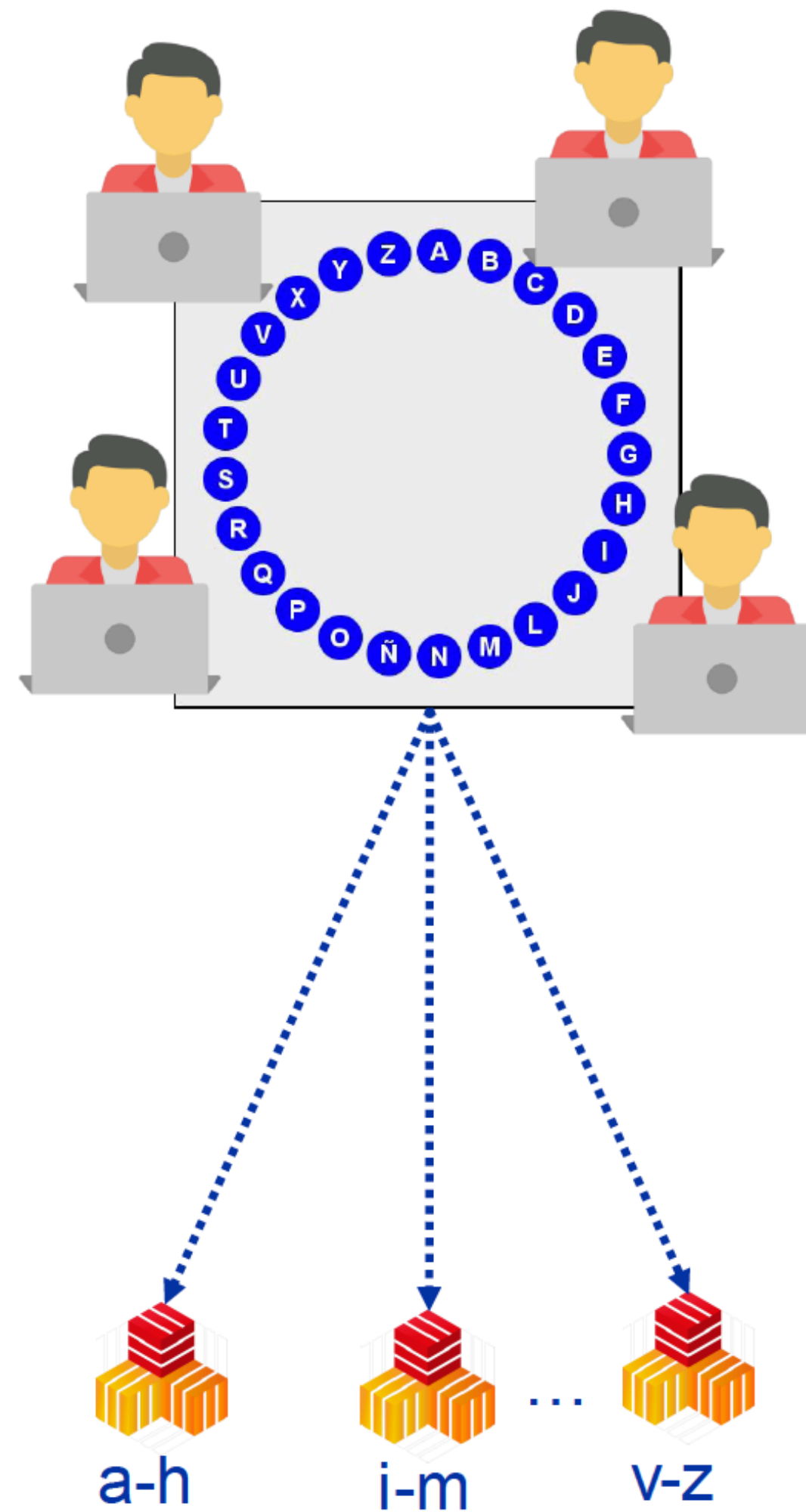
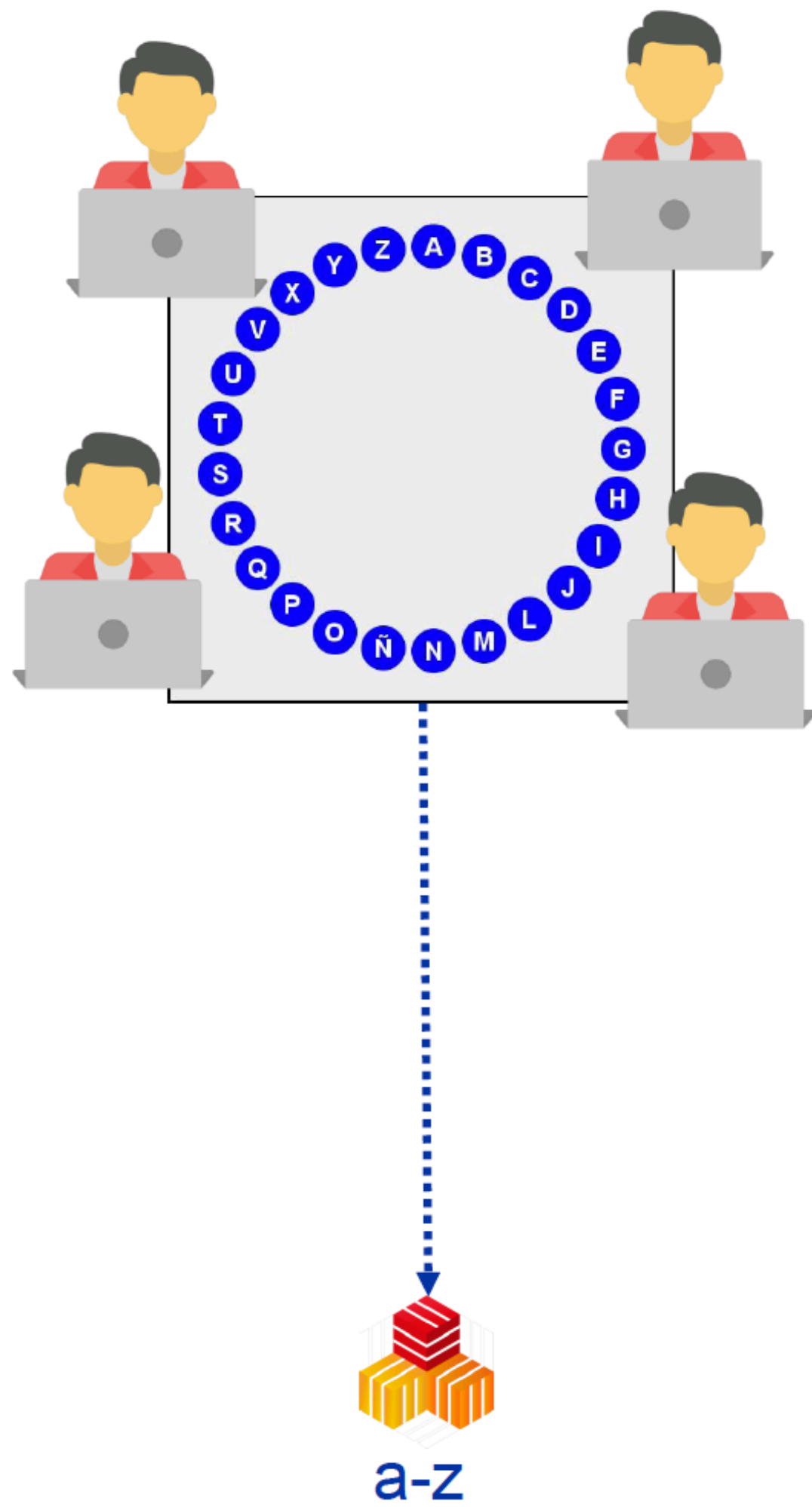
# ScienceMesh

## Collaboration across deployments

- Collaboration across deployments and EFSSs
- Integrations with:
  - Rclone
  - Rucio (GSOC project)



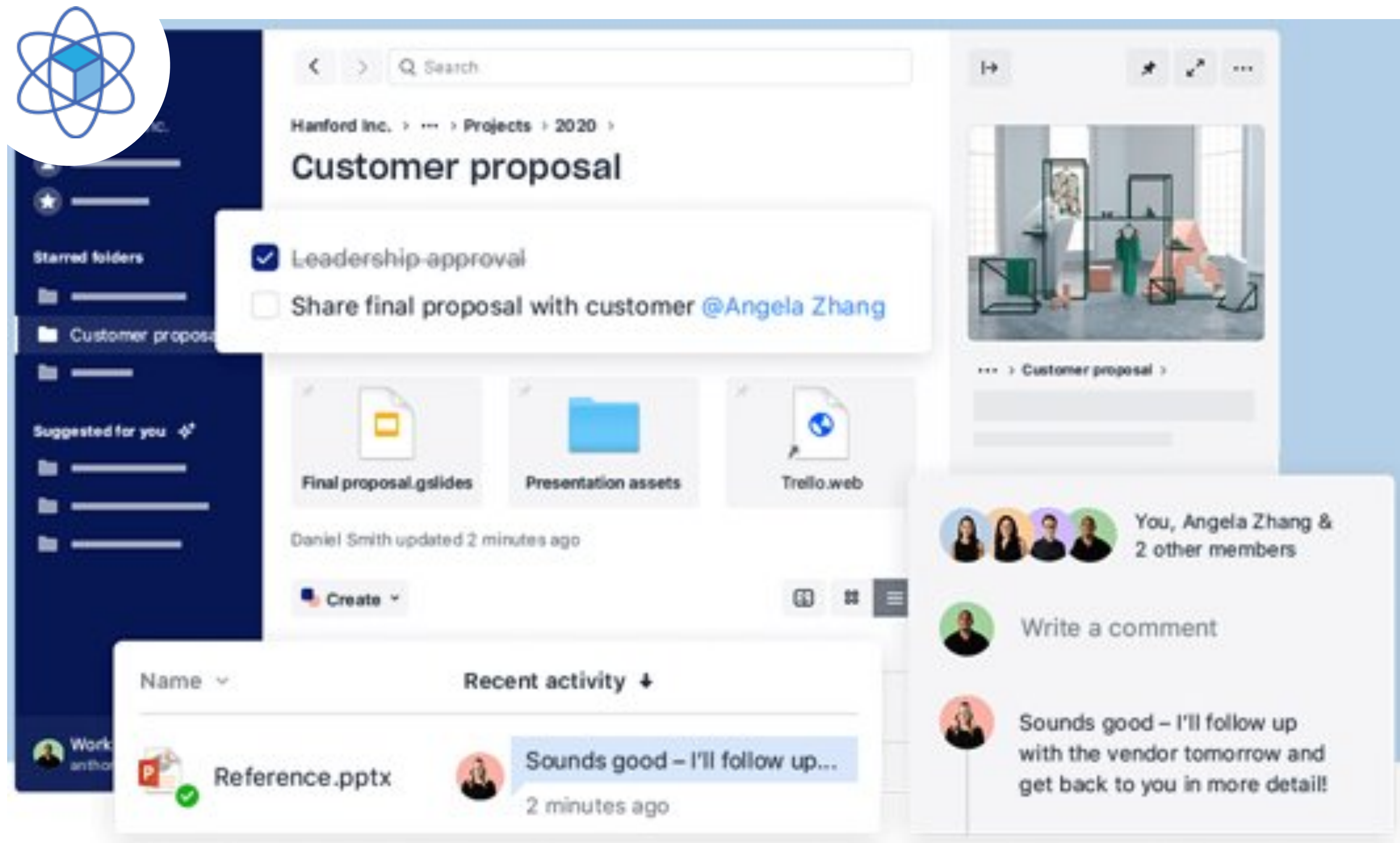
# Organic Quality of Service





# CERNBox 2030

Your one stop operating system



**Thank you!**