

# OpenCloudMesh

From concept to reality...

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Open Cloud Mesh (OCM) is a joint international initiative under the umbrella of the GÉANT Association that is built on the open Federated Cloud Sharing application programming interface (API) - first initiated and implemented by ownCloud Inc.

Taking Universal File Access beyond the borders of individual clouds and into a globally interconnected mesh of research clouds without sacrificing any of the advantages in privacy, control and security an on-premises cloud provides.

OCM defines a vendor-neutral, common file access layer across an organization and/or across globally interconnected organizations, regardless of the user data locations and choice of clouds.

To enable

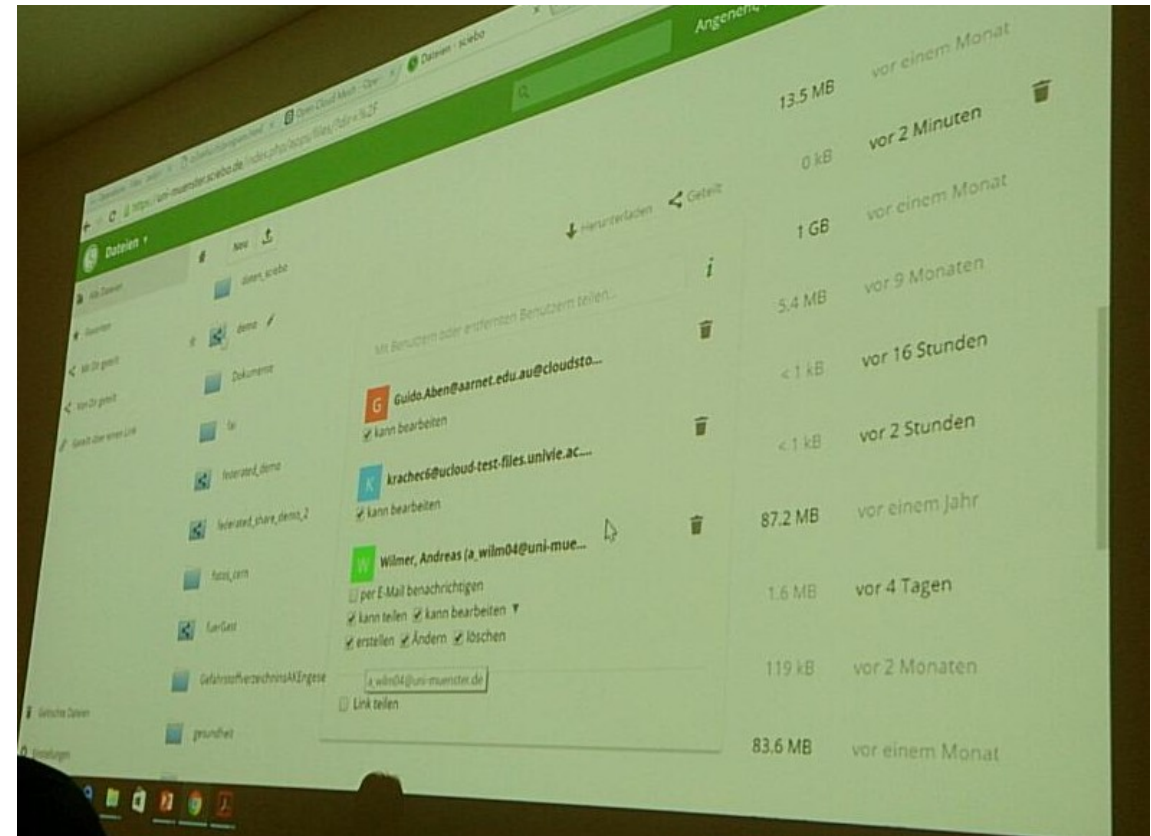
**secure, open,  
frictionless,**

file sharing, **everywhere**

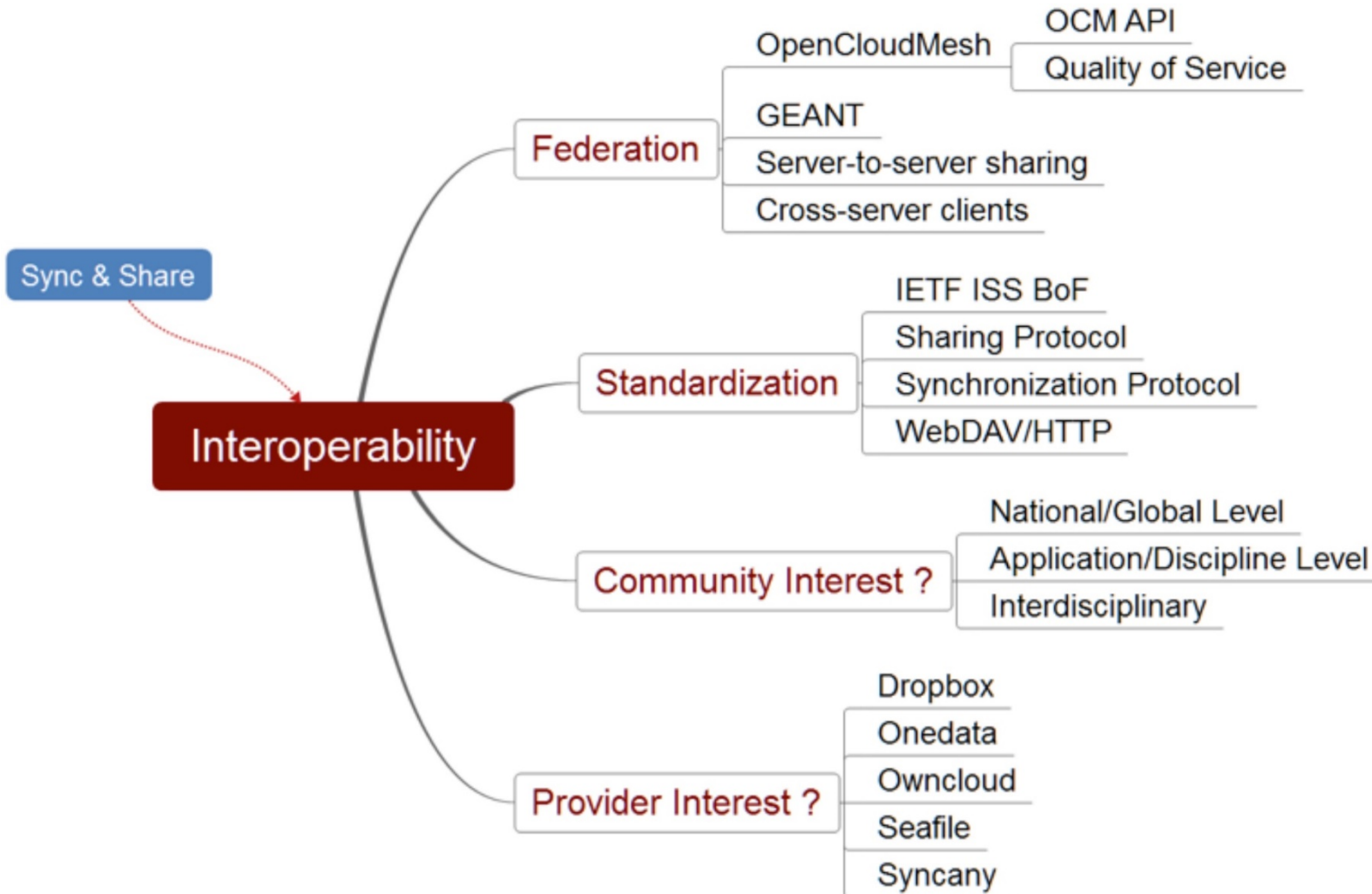


# OCM Phase I.

- Code v.0.002 has been released on 27 July 2015 by ownCloud Inc.
- **Kick-off meeting: 22 October, 2015 in Vienna, Austria**
- OpenCloudMesh = ownCloudMesh
- **USE CASE: Uni Münster server-to-server sharing**
- During the OCM demonstration, users were able to sync and share files and folders between independent service domains operated by University Münster in Germany, University Vienna in Austria, SWITCH, the national research and education networking (NREN) organisation of Switzerland and AARNet the NREN of Australia.

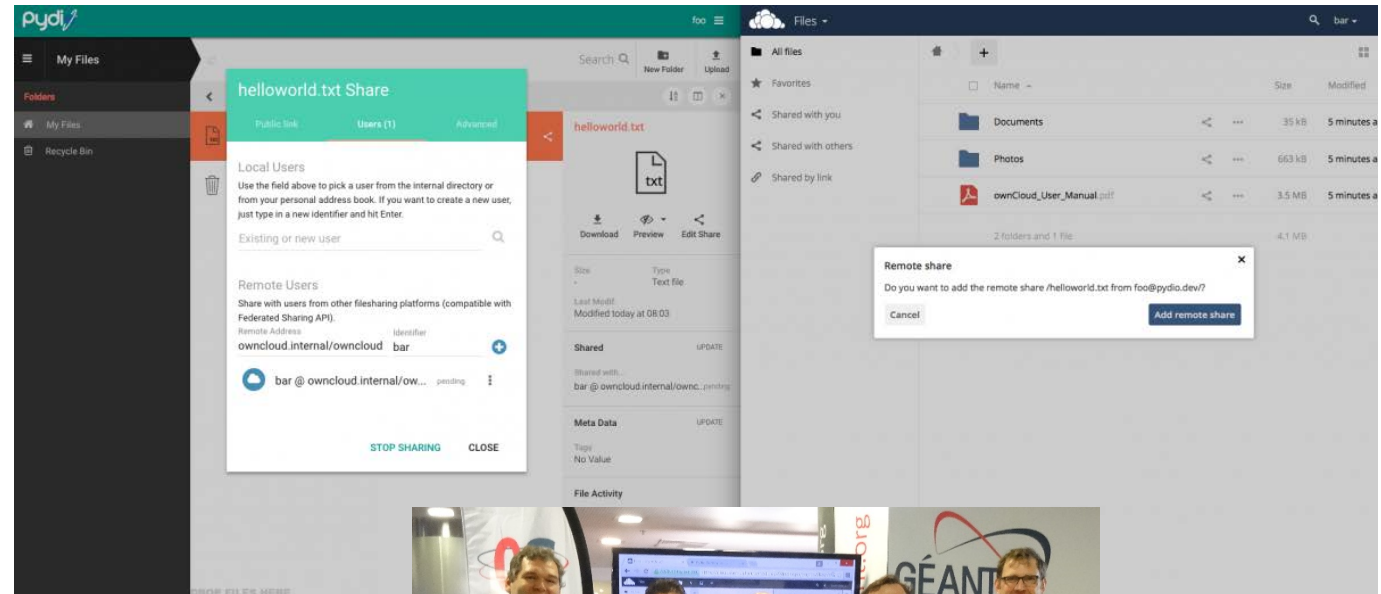


CS3 Workshop, 18-19 January 2016 in Zurich, Switzerland



# OCM Phase II.

- March, 2016 - Charles du Jeu and David Gillard from Pydio (<https://pydio.com/>) joined the OCM project.
- Discussion with others: Zettabox, PowerFolder, Nextcloud, ...
- OpenCloudMesh
- **USE CASE: AARNet (Australia) uses ownCloud and ASNET-AM (Armenia) uses Pydio.**
- **DEMONSTRATION ownCloud, Pydio: Interoperability demo at GÉANT booth**
- **TNC - 13 June 2016**

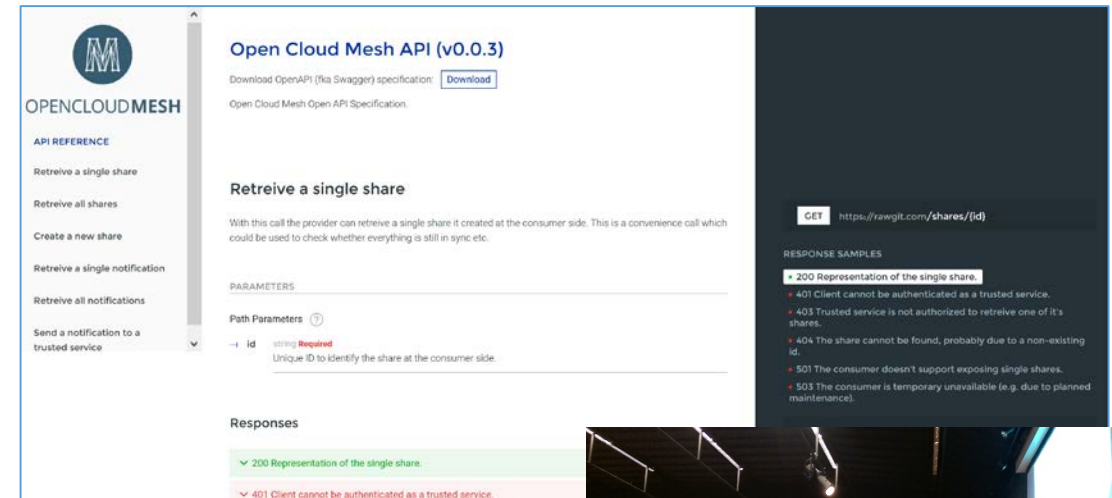


This vision is that the OCM spec should be:

- **compliant:** with standard practices of the http world (error codes, conventions,...)
- **described:** using industry-strength documentation/testing system (e.g. swagger.io)
- **neutral:** should not have any artifacts or assumptions stemming directly from particular implementation or implementation language
- **modular:** allow providers to implement minimal functionality and add optional components of the spec as they please (or not)
- **minimal:** offload as much as possible of additional functionality to existing mechanisms in the network, especially for optional modules (e.g. lookup)
- **secure:** compliant with modern security frameworks (e.g. OAuth2, JWT, ...) For the modules, I would consider at first: - auth/autz negotiation - sharing of files - synchronization of files - user discovery (optional)
- **robust:** implementations should continue to deliver their service even when interacting with a failed implementation/service or malicious intended attempts at federation as attack vector

# OCM Phase III.

- We found a professional protocol designer (APIwise) who described OCM in a more formalized way (using OpenAPI/Swagger Framework).
- To establish a reference infrastructure and test environment where the implementations can be validated against.
- Implementations at ownCloud, Pydio and Nextcloud (PowerFolder in the pipeline).
- *Meeting with Apiwise on 12/07/2016*
- **Make it happen: AARNet, Nextcloud, Sciebo, ownCloud, Uni Vienna, CESNET, GWDG and CERN**
- GitHUB: <https://github.com/GEANT/OCM-API>
- API reference documentation <https://rawgit.com/GEANT/OCM-API/v1/docs.html>



Delivered by 10 February 2017  
CS3 Workshop in Amsterdam



**CALL FOR IMPLEMENTATIONS  
AND USE CASES**

UP<sup>2</sup><sub>U</sub>

Next Generation  
Digital Learning  
Environment



UP<sup>2</sup><sub>U</sub>

Next Generation  
Digital Learning  
Environment



UP<sup>2</sup><sub>U</sub>

Next Generation  
Digital Learning  
Environment



### Outcome: What's next?

1. sharing and federated sharing (this is the CORE)
2. synchronisation and accessing the file using WebDAV or other file transfer protocol (this could be only a starting point for discussion)
3. service/user discovery (next thing)
4. what to do with the files/folders after sharing... (outside of scope)

- Phase IV. aims at paving the way towards standardization.
- Explore patent and IPR issues, as well as the potential fora for initiating the standardization discussion (IETF, IEEE Intercloud, ...).
- Need a reference installation (proxy) fully compliant with the latest specs.
- **GÉANT SIG-CISS in Amsterdam**
  - Build a reference proxy/gateway implementation of the agreed OpenCloudMesh (OCM) federated sharing protocol specification to support the on-boarding of closed-source EFSS solutions as well as the compliance of the current open-source products.
  - Being investigated...

## OCM Natives



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Google Drive



OneDrive

GÉANT Cloud

# OPTION A. – Become native

## OCM Natives



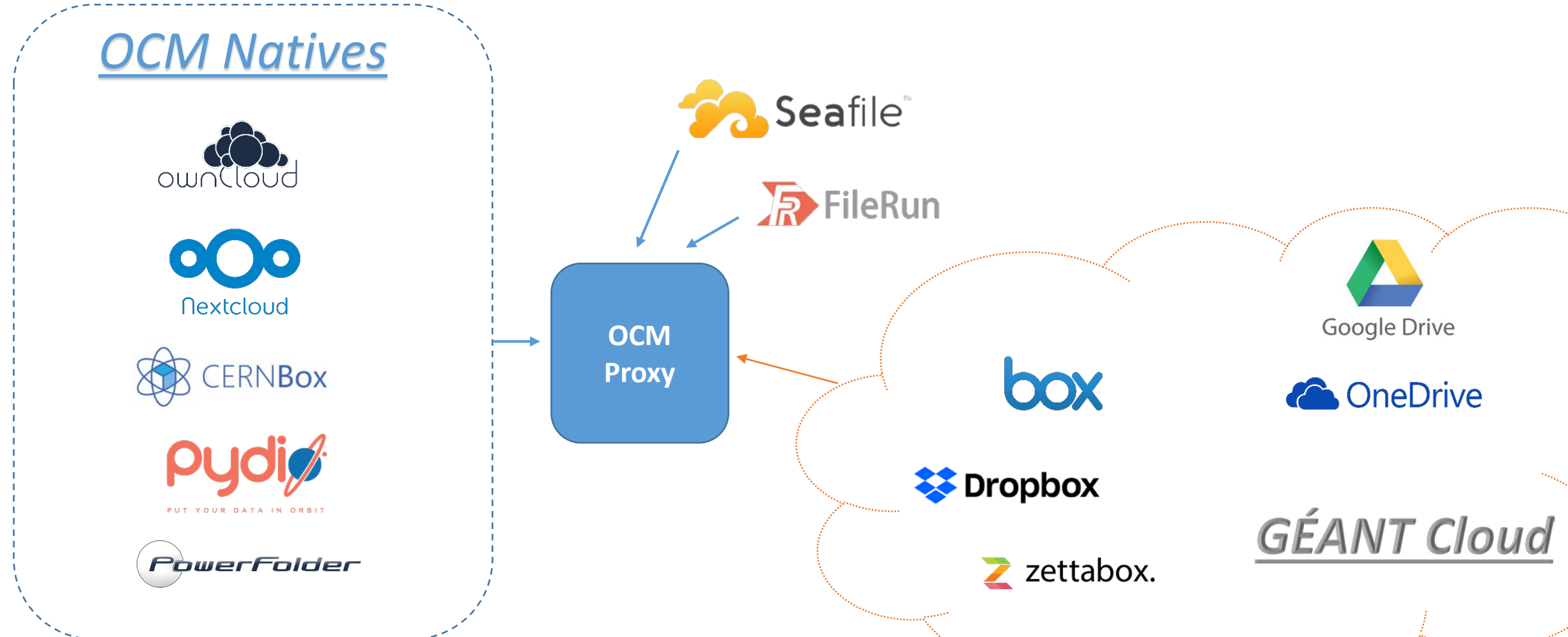
Google Drive



OneDrive

GÉANT Cloud

# OPTION B. – Use a proxy

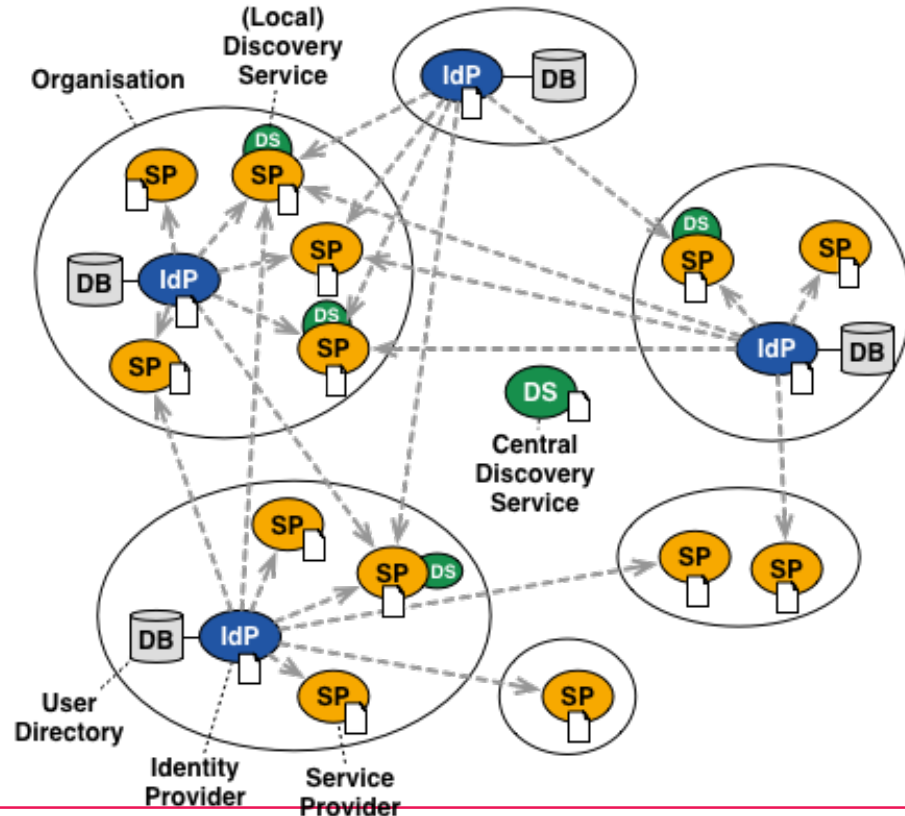


# Examples from the Federated AAI space

## Full Mesh Federation

~80% of all NREN Federations (June 2013)

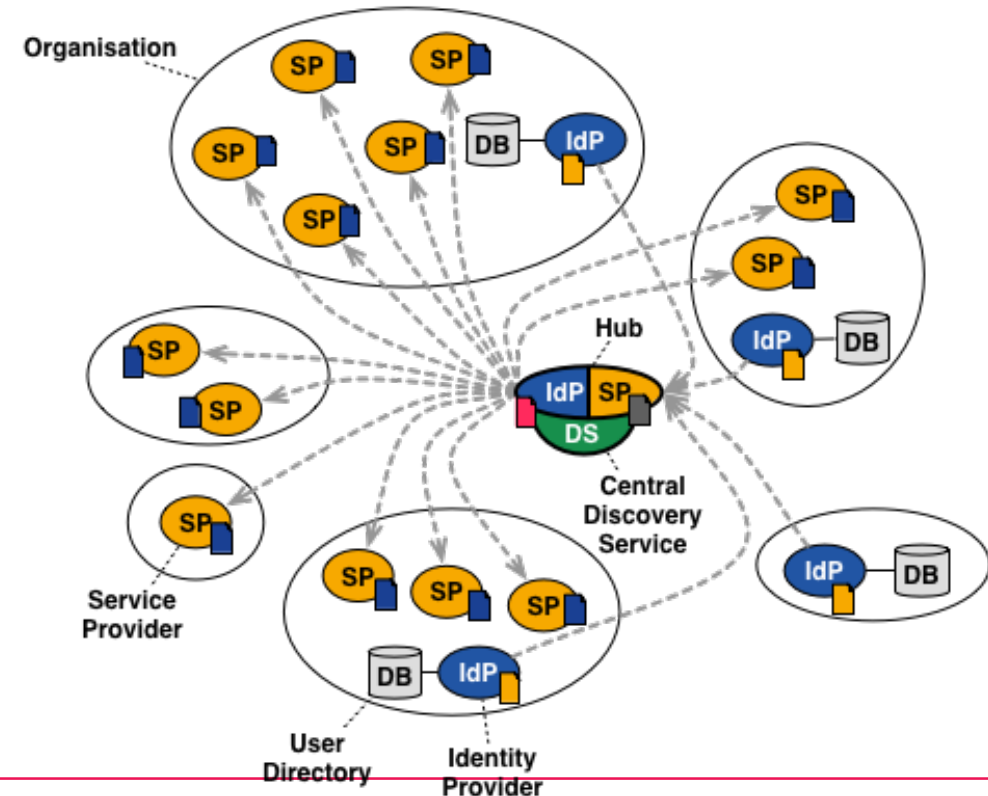
E.g InCommon, UKAMF, SWITCHaai, SWAMID, HAKA, AAF



## Hub-and-Spoke Federation with Distributed Login

~15% of all NREN Federations (June 2013)

SURFconext, WAYF.dk, SIR, TAAT, Confia



Open for discussion...



Thank you and any questions



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