



OPENCLOUDMESH **CAMPFIRE**

**STATUS OF THE CS3 SIG AND FUTURE PLANS TOWARDS
IETF STANDARDIZATION**

Giuseppe Lo Presti, CERN

On behalf of the CS3 SIG and the OCM IETF Working Group

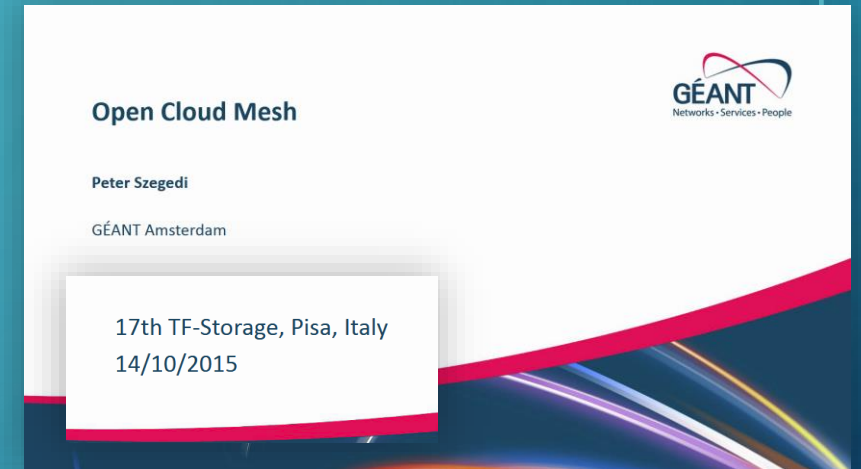
CS3 WORKSHOP 2026, OSLO, 17-19 MARCH 2026

OUTLINE

- A brief history
- 2025: a busy year for OCM!
 - Engaging with the IETF
 - Expanding the scope
 - The latest version of the spec and its coverage by the vendors
- What's coming up in 2026

BRIEF HISTORY

- Project initiated 11 years ago in GÉANT to establish a federation of cloud storage sites
- Enables users to **share their institutional data across AAI boundaries** and collaborate with others
- Adopted by the CS3 Community in 2020
- Funded by different programs throughout the years
 - Currently, received funds by **SovereignTech agency**
 - Also, partial support from **EOSC Data Commons**



Sovereign Tech Agency





ENGAGING WITH THE IETF

- 2024/11: published the OCM spec as <https://datatracker.ietf.org/doc/draft-lopresti-open-cloud-mesh>
- 2025/07: successful “dispatch” at IETF 123, the ocm@ietf.org mailing list is born
- 2025/08: offer to form a Working Group
- 2025/11: first IETF WG meeting, attended by 13 participants. The draft is adopted

The screenshot shows a video conference interface. The main content is a presentation slide titled "IETF123 DISPATCH" with the subtitle "Development and Current Implementations". The slide text reads: "Initiative started in 2015 by GEANT, first implemented by ownCloud. Currently hosted as part of the CS3 (Cloud Storage for Sync & Share) Community. Implementations include CERNBox, OpenCloud, ownCloud, Nextcloud and Seafile. Previously Pydio also implemented the specification." Below the text are logos for CERNBox and OpenCloud. To the right of the slide is a small video feed showing a speaker at a podium. Below the slide is a video player with a "Speaking" indicator and a progress bar at 10:16 / 1:57:37. In the foreground, there is a meeting agenda window with the following items:

- Administrivia: Chairs**
 1. Agenda | NOTE WELL | Scribes
 2. Document status - Chairs - 5 min
- Agenda**
 1. History and Current Status - Giuseppe - 5 min
 2. Ongoing Work - Micke - 10 min
 3. Code Flow Enhancements - Micke - 5 min
 4. Summary of OCM Implementation Efforts - Mahdi - 10 min
 5. Discussion - 20 min

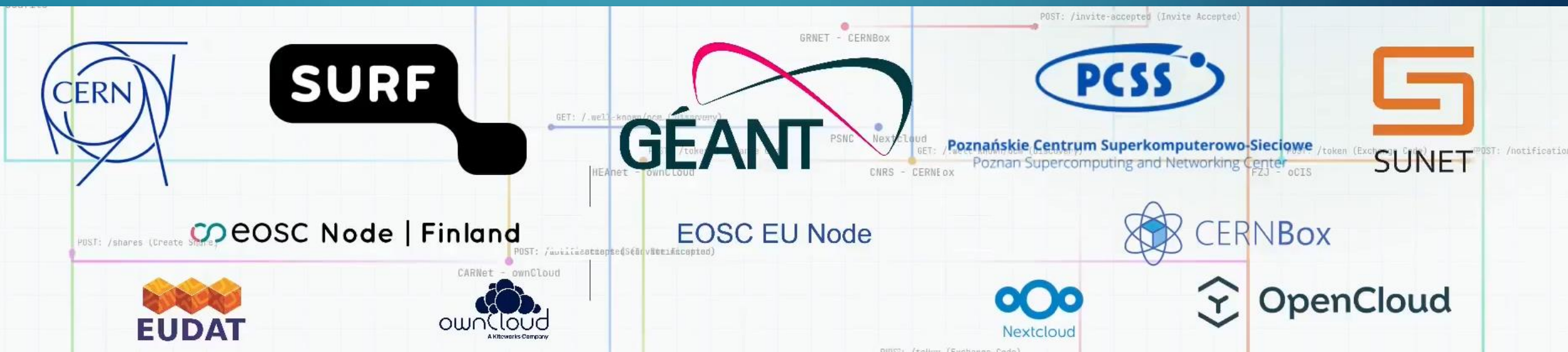
At the bottom right, there is a list of participants:

- Thibault Meunier (OCM CHAIR)
- Bo Bai (PARTICIPANT)
- David Millman (PARTICIPANT)
- David Walter (PARTICIPANT)
- Frida Hjelm (PARTICIPANT)
- Giuseppe Presti (PARTICIPANT)
- Mahdi Baghani (PARTICIPANT)
- Matthias Kraus (PARTICIPANT)
- Maxence Lange (PARTICIPANT)
- Micke Nordin (PARTICIPANT)
- Peter Szegedi (PARTICIPANT)
- Richard Freitag (PARTICIPANT)
- Ted Hardie (PARTICIPANT)

At the bottom center, there is a small video feed of a participant.

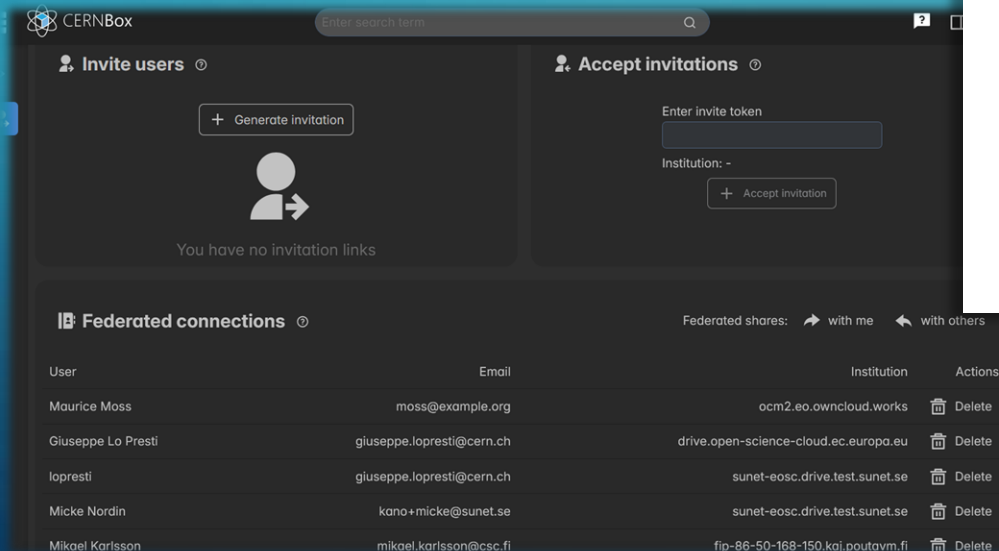
EXPANDING THE SCOPE

- 2025/05: Established an **EOSC EFSS sub-group** to coordinate the deployment of OCM capabilities in the **EOSC Federation**
- 2025/10: Engaged with multiple institutions and with **all EFSS vendors** to prepare a production-like demo for the **EOSC Symposium 2025**



EXPANDING THE SCOPE

- Demonstrated interoperability across multiple vendors at the EOSC Symposium 2025



Federated File Sync & Share via standard protocol 10 years from piloting to standardization

1st demonstration at the GÉANT TNC'16
Conference in Prague, Czech Republic
13 June 2016



IETF Standardization Working Group
Open Cloud Mesh
23 October 2025



<https://datatracker.ietf.org/group/ocm/about/>

Open Cloud Mesh (OCM) is a server-to-server protocol designed to enable federation between Enterprise File Sync and Share (EFSS) platforms. Initially conceived of in 2015 and deployed since 2016, OCM has been implemented by several platforms. This working group seeks to formally specify OCM.

Node Candidates

- EU Node
- CERN Node
- SURF Node
- Finland Node
- EUDAT Node

Technologies

- *ownCloud*
- *Nextcloud*
- *CERNbox*
- *OpenCloud*

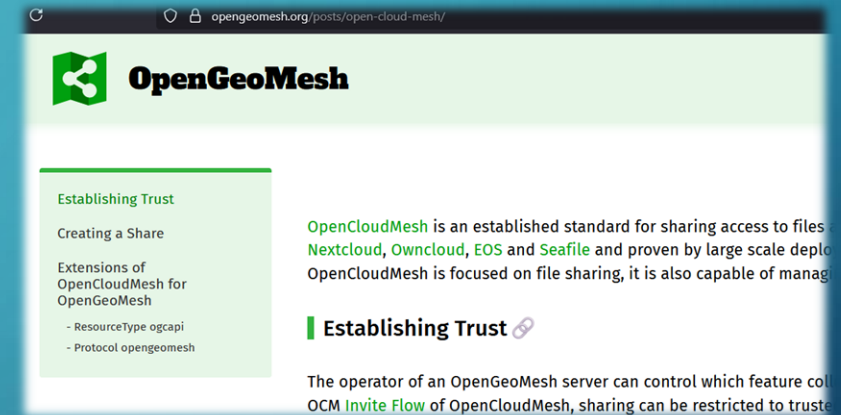


EXPANDING THE SCOPE

OCM beyond storage:

- **OpenGeoMesh** initiative
- **RO-Crate** dispatching in EOSC Data Commons (cf. previous session)
- **FileSender** project at SUNET

Significant interest from the IETF WG to apply the OCM concepts beyond storage and EFSS



CURRENT STATUS

- **71** members in the Matrix channel
- **61** members in the ocm@ietf.org list
- **v1.3** is the latest version

<https://datatracker.ietf.org/doc/draft-ietf-ocm-open-cloud-mesh>

- Incremental additions on top of v1.2

Datatracker Groups ▾ Documents ▾ Meetings ▾ Other ▾ giuseppe.lopresti ▾ Document search

Open Cloud Mesh

draft-ietf-ocm-open-cloud-mesh-04

Status: IESG evaluation record IESG writeups Email expansions History

Versions:

00 01 02 03 04

draft-lopresti-open-cloud-mesh 00 01 03 04 05 06 08

draft-ietf-ocm-open-cloud-mesh 00 02 03 04

Nov 2024 Apr 2025 Jun 2025 Jul 2025 Aug 2025 Oct 2025 Nov 2025 Jan 2026 Feb 2026 Mar 2026

Document	Type	Active Internet-Draft (ocm WG)
	Authors	Giuseppe Lo Presti ✉, Michiel B. de Jong ✉, Mahdi Baghbani ✉, Micke Nordin ✉
	Last updated	2026-03-16
	Replaces	draft-lopresti-open-cloud-mesh
	RFC stream	Internet Engineering Task Force (IETF)



Sovereign Tech
Agency

COMPLETED DEVELOPMENTS IN 2025

- Test suite integrated in all CI pipelines
- Where-are-you-from page and directory service for all EFSS vendors, all merged upstream
- Cernbox
 - Support for legacy shares with basic auth
 - General rehaul of the code base
- Opencloud
 - Bug fixes for invites
- oCIS
 - Bug fixes targeting the EOSC EU Node
- OpenGeoMesh
 - Implemented in Rust following OCM v1.3
- Nextcloud
 - Accept Multi protocol
 - Full support for invites
 - Support for folder shares
 - Token exchange

READINESS AND COMPLIANCE

Started to track implementations' coverage and readiness of the different features and capabilities exposed by the spec

- As a gauge of how far implementers have **adopted** it

Feature	CERNBox	oCIS	OpenCloud	Nextcloud	Seafile
Invite	✓	✓	✓	✓	✗
Share	✓	✓	✓	✓	✓
Access	✓	Bearer	Bearer	Basic	✓
Notifications	✗	✓	✓	✓	✗
Token exchange	✗	✗	✗	✓	✗
Apps	✓	✗	✗	✗	✗

READINESS AND COMPLIANCE

Started to track implementations' coverage and readiness of the different features and capabilities exposed by the spec

- As a gauge of how far implementers have **adopted** it
- As a gauge of **maturity** of the spec itself

Implementations readiness and spec maturity

Giuseppe Lo Presti edited this page 2 minutes ago · [7 revisions](#)

This page summarizes the current understanding of different aspects of the OCM specifications and the existing implementations

Spec aspect	Status	Usage and maturity
Discovery endpoint	Production	CERNBox on v1.2 format, all other implementations on v1.1
Invite endpoint	Production	All known implementations can interoperate
Sharing of Files/Folders via <code>webdav</code>	Production	Most implementations interoperate, with different auth methods
Notifications of changes to shares	Production	Implemented by Nextcloud and oCIS, interoperability to be validated
Sharing of Telcos via <code>talk</code>	Production	Implemented by Nextcloud only
Sharing of Files via <code>webapp</code>	Prototype	Demonstrated by CERNBox only
Sharing of Files/Folders for <code>datatx</code> access	Concept	Partially demonstrated as part of the ScienceMesh project in 2022
Sharing of Files/Folders via <code>ssh</code>	Concept	Prototype being developed
Enforce <code>criteria</code> in a share	Concept	No implementations available
Enforce <code>must-use-mfa</code> requirement	Prototype	Partial development in Nextcloud
Enforce <code>must-exchange-token</code>		

ONGOING DISCUSSIONS ON SPEC CHANGES

- Federated contacts' and shares' **lifecycle**
 - What happens when a collaboration ends?
- Sharing to **groups** or federations
 - One of the objectives of the EOSC4ALL project
- Resource discovery and request access
- Journaling

...Contributions more than welcome!



FURTHER PLANNED DEVELOPMENTS

Follow along on GitHub: <https://github.com/orgs/cs3org/OCM-STA>

The screenshot shows a Jira project board for 'SovereignTech Funded Activities'. The board is organized into five columns: Backlog (7 items), Ready (3 items), In progress (3 items), In review (4 items), and Done (24 items). Each column contains task cards with titles and descriptions.

Column	Count	Estimate	Task ID	Description
Backlog	7	0	OCM-STA #26	Attend the meetings of the WG being formed within IETF, follow their work and provide feedback
Backlog	7	0	OCM-STA #24	Return graded report
Backlog	7	0	OCM-STA #23	Deploy on CS3 GitHub Pages
Backlog	7	0	OCM-STA #22	Add external probes (well-known, TLS, sign-key)
Backlog	7	0	OCM-STA #21	Building on the M5 deliverable, provide a JSON-level standalone validator endpoint for any implementer to test against
Backlog	7	0	OCM-STA #20	Validate Nextcloud to CERNBox application
Ready	3	0	OCM-STA #27	Get all standardization-related documents in shape according to IETF deadlines in the course of 2026 and prepare for IETF 126 in Vienna
Ready	3	0	OCM-STA #18	Implement Log viewer in CI job summary
Ready	3	0	OCM-STA #17	Implement JSON logs per platform, artefact upload
In progress	3	0	OCM-STA #25	Incorporate in the IETF Internet Draft all suggested changes following implementations from all other Milestones
In progress	3	0	OCM-STA #15	Validate logic against CERNBox
In progress	3	0	OCM-STA #16	Implement spec conformance tests: CERNBox to Nextcloud share round-trip with token exchange on remote access
In review	4	0	OCM-STA #29	Implement bearer auth for accessing shares, both incoming and outgoing
In review	4	0	OCM-STA #12	Implement better configurability
In review	4	0	OCM-STA #13	Implement Docker deploy
In review	4	0	OCM-STA #14	Implement full support in the OCM Test Suite
Done	24	0	OCM-STA #9	Implement any necessary fix for the sharing phase to pass the OCM Test Suite
Done	24	0	OCM-STA #11	Implement capability discovery endpoint, loading certificates, ACME auto TLS
Done	24	0	OCM-STA #10	Rewrite OCM stub in a compiled language
Done	24	0	ocm-test-suite #208	Feature: Where Are You From tests for CERNBox and Nextcloud
Done	24	0	OCM-STA #7	Add support for multi-protocol sharing in Nextcloud
Done	24	0	OCM-STA #6	Extend Nextcloud's authentication logic to cover

FURTHER PLANNED D

A shout out to Mahdi, who should have been presenting his outstanding work on the OCM test suite and many other contributions but could not leave his country.

OCM Campfire



Mahdi Baghbani

MahdiBaghbani · he/him

Follow

Having fun while working on OSS

58 followers · 34 following

@pondersource

Tehran

17:45 - 2h30m ahead

mahdi-baghbani@azadehafzar.io

https://mahdibaghbani.dev

in/mahdibaghbani

@baghbani1

@mahdibaghbani@mastodon.azadehafzar.io

Achievements



MahdiBaghbani / README.md

A Software Engineer



GitHub Stats

Mahdi Baghbani

Joined GitHub 10 years ago

Followed by 58 users

Activity

4815 Commits

26 Pull requests reviewed

91 Pull requests opened

20 Issues opened

396 issue comments

59 Repositories

Prefers AGPL-3.0 license

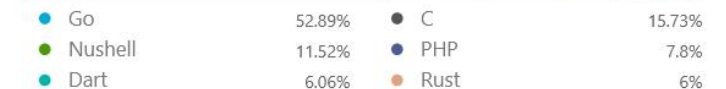
0 Releases

13 Packages

6.22 GB used

36 Languages

Most used languages



These metrics include private contributions
Last updated 10 Mar 2026, 02:42:03 with lowlighter/metrics@3.34.0

Pinned

cs3org/OCM-API Public

OpenCloudMesh API

cs3org/ocm-test-suite Public

A collection of Docker images and scripts designed to set up a complete development environment for

WHAT'S NEXT

- The spec work with IETF is well on track, with a deadline by year-end 2026
 - A Working Group in-person meeting is planned for IETF 126 Vienna, in July: all vendors are invited to participate either in person or remote
- **This is (y)our opportunity to shape OCM in the direction we want: please do contact us if interested!**
 - Home Page: <https://www.cs3community.org/ocm>
 - Repository: <https://github.com/cs3org/OCM-API>
 - Matrix channel: https://app.element.io/#/room/#cs3org_OCM:gitter.im



OPENCLOUDMESH

THANK YOU FOR YOUR ATTENTION!

QUESTIONS?



OPENCLOUDMESH **PANEL**

Invited Panelists:

Tobias Baader (OpenCloud)

Diogo Castro (CERNBox)

Łukasz Opioła (OneData)

Björn Schießle (Nextcloud)

David Walter (ownCloud)

Jonathan Xu (Seafile)