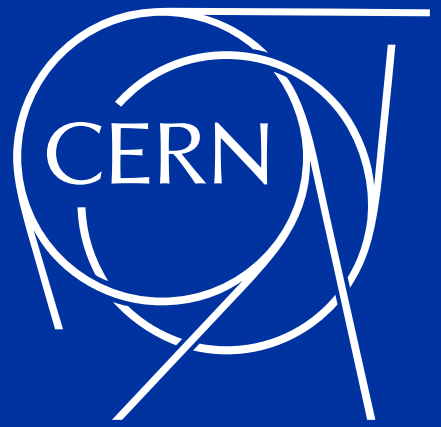


CERNBox Horizon 2030

EOS Workshop 2021

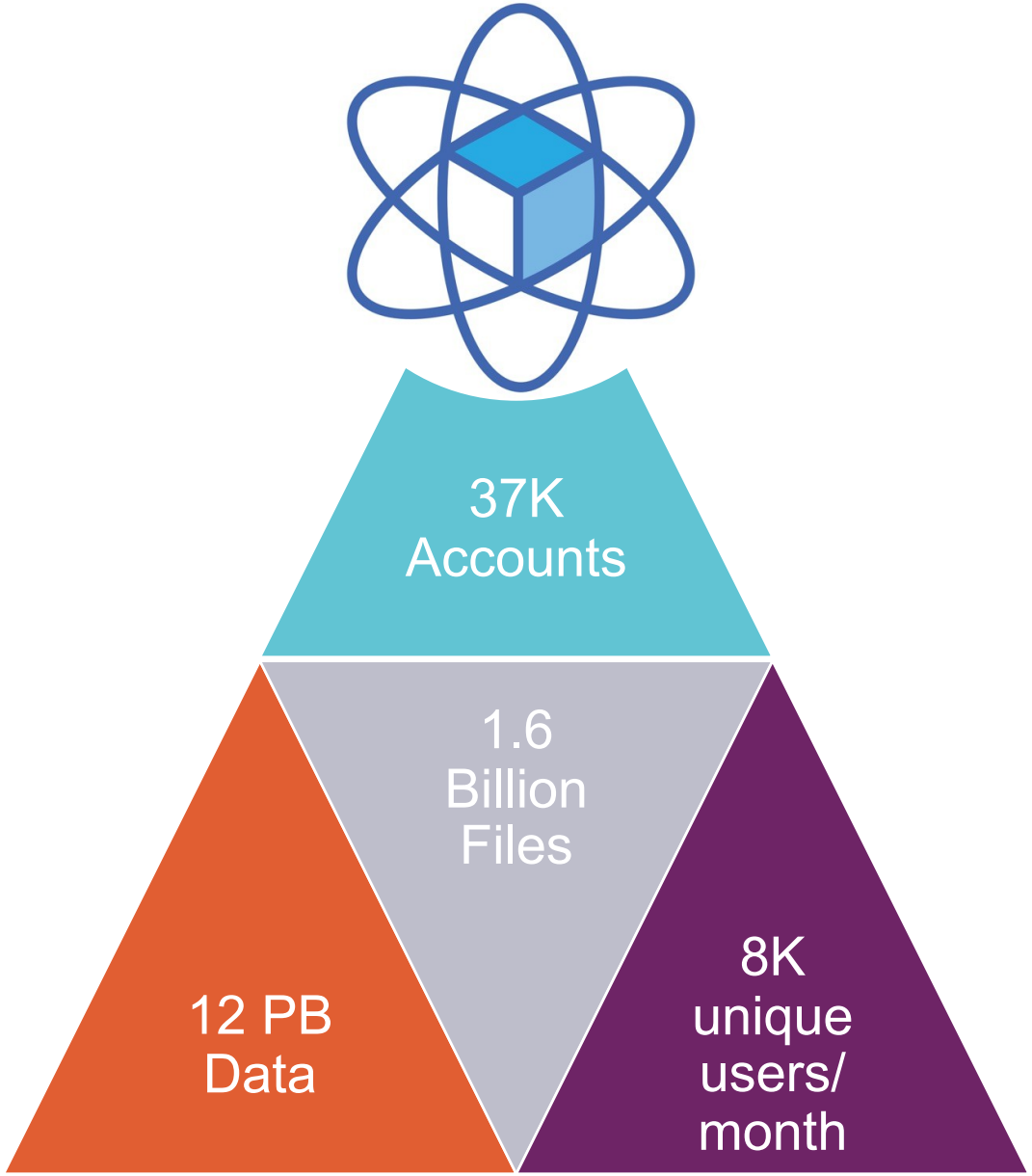
Hugo Gonzalez & Ishank Arora

(CERN IT Storage)

3rd March 2021

CERNBox in a nutshell

Sync and Share	• Dropbox-like use-case • Offline access to data • Universal access to data
Web Apps	• Real time collaboration • Office documents
Online filesystem access	• SAMBA (Windows) • FUSEX (Linux)
Physics integration	• ROOT • SWAN • LXPLUS/LXBATCH



Behind the curtains

Universal access
Real time collaboration

draw.io
ROOT Data Analysis Framework
ONLYOFFICE
Collabora
CodiMD
jupyter

Offline access
(mobile, desktop, tablet)

ownCloud Sync Clients

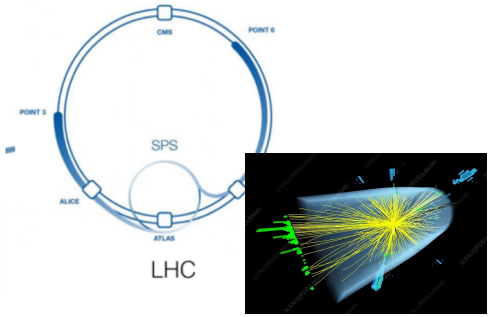
Windows online filesystem

Windows

POSIX online filesystem

indico
CDS
zenodo
AV
...
LINUX

Physics analysis



Web Apps

SAMBA

ownCloud Sync & Share

Reva

FUSEX

xroot

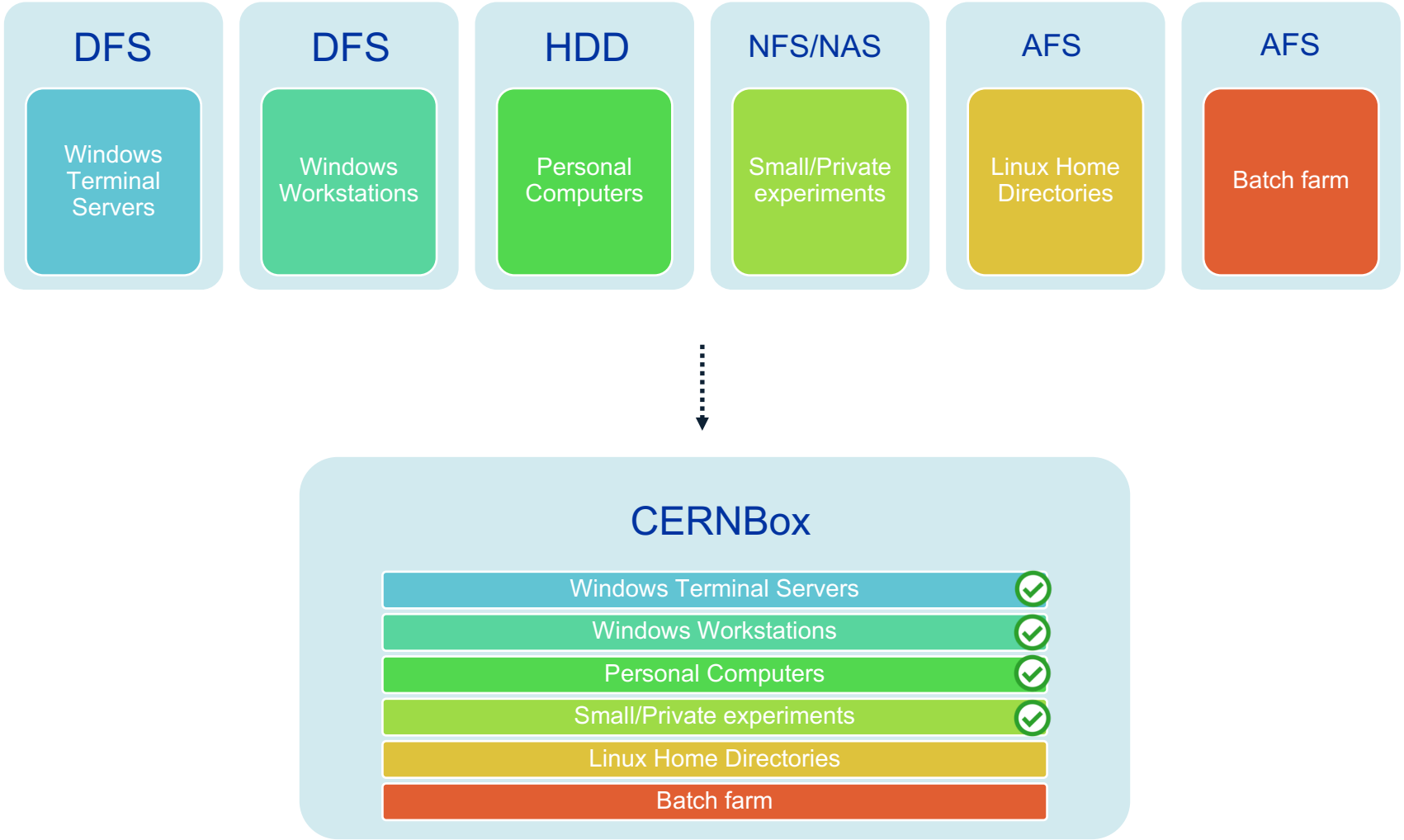
EOS for Home and Project Spaces (9 instances)

Deep dive into specific components

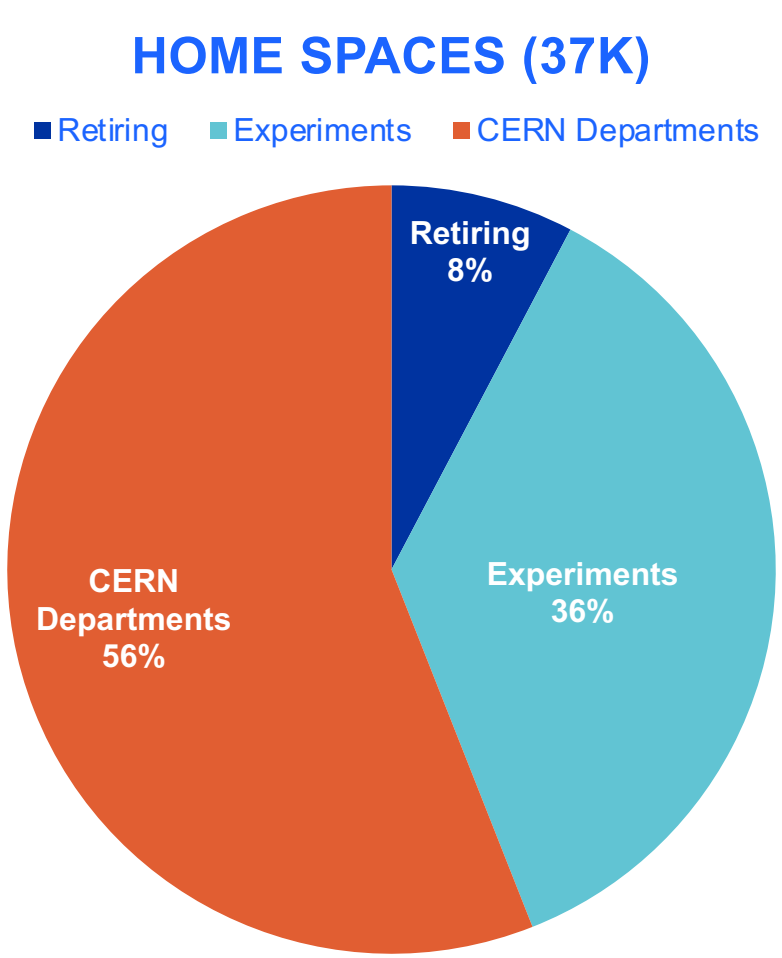
- EOS for CERNBox report – Roberto – Wed @ 15:00
- SAMBA: lessons learned – Aritz – Wed @ 15:40
- Multi-lock support for Office offline and online applications in CERNBox – Giuseppe – Wed @ 16:40
- Making Reva talk to EOS: ultimate scalability and performance for CERNBox – Frabrizio – Wed @16:50
- OCIS meet Reva: hands-on – Samuel – Tue @ 17:10

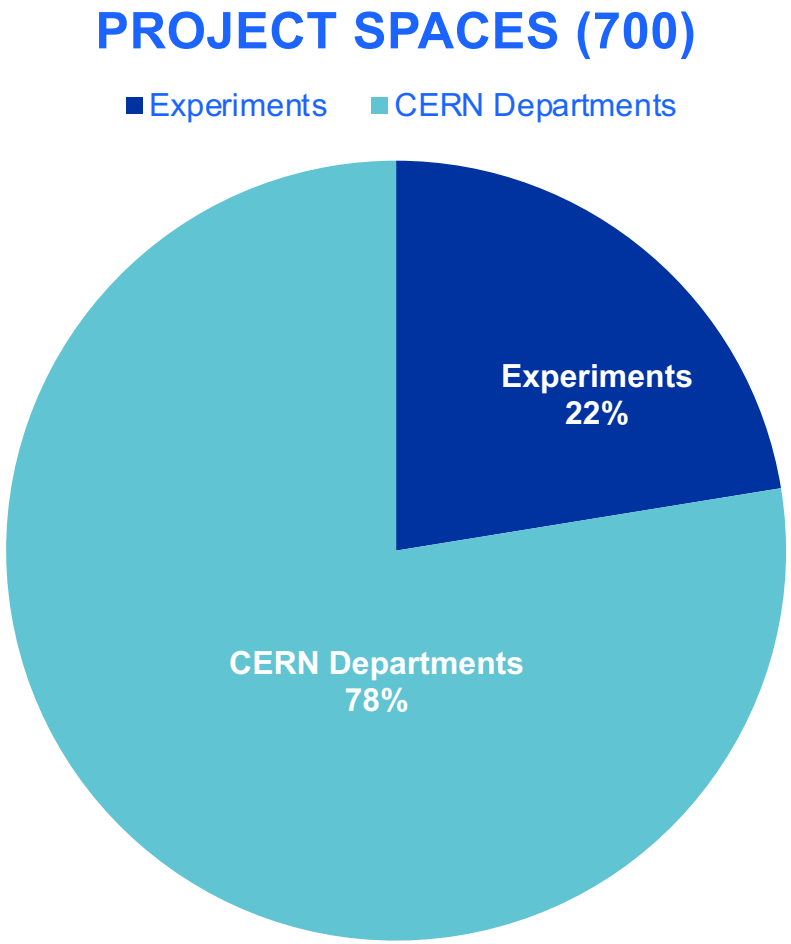
Major Working Areas: Unified Spaces

Unified Spaces: Homes and Workspaces



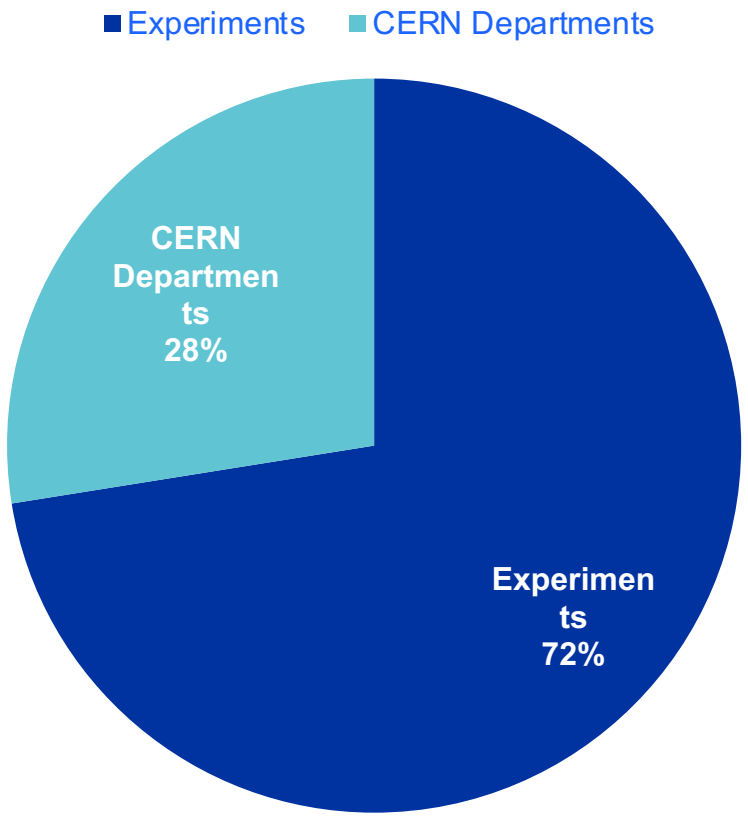
Distribution of Spaces



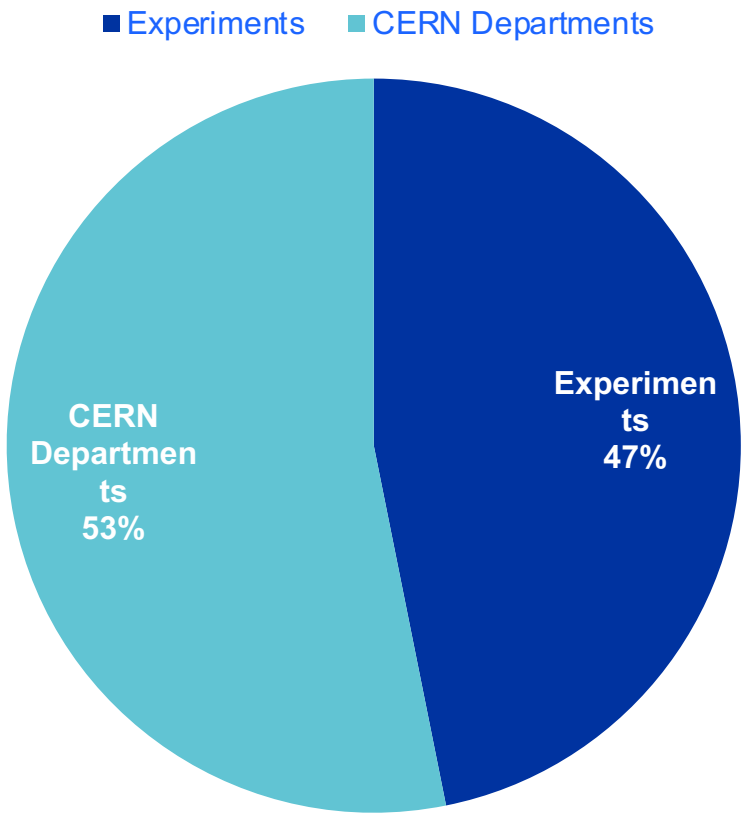


Distribution of Spaces by Volume

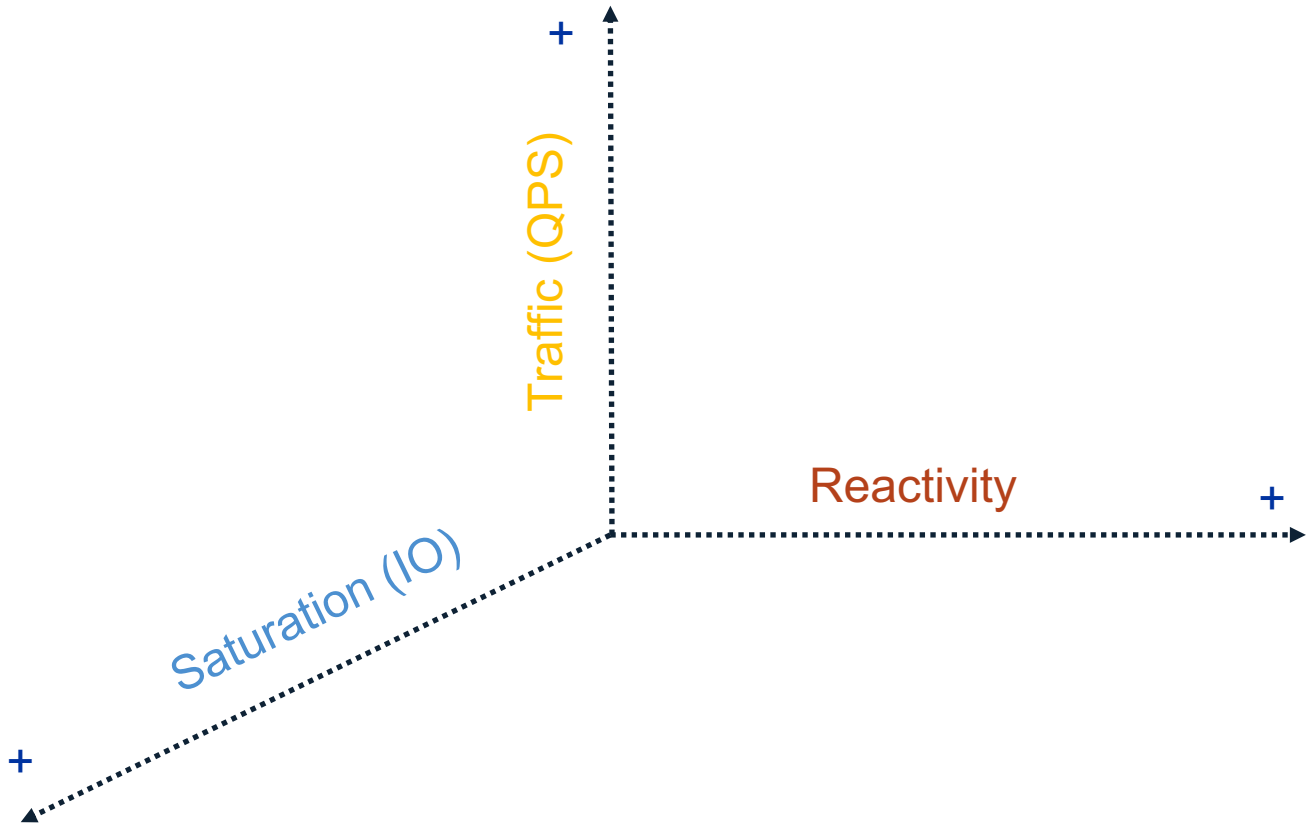
HOME SPACES (3.4 PB)



PROJECT SPACES (2.2 PB)



Challenges: Symbiosis of extreme use-cases

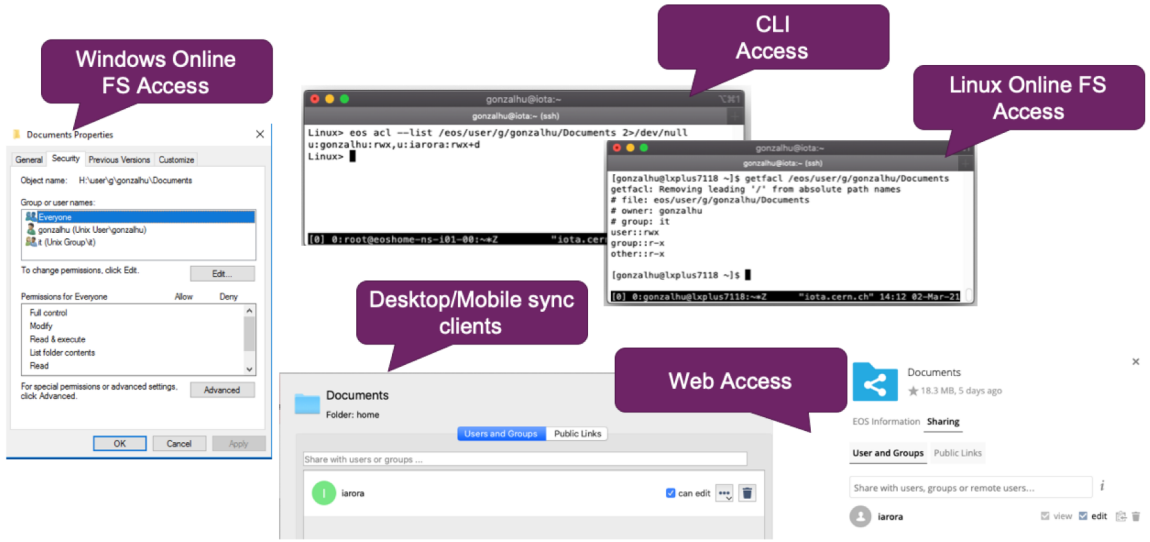


	Saturation	Reactivity	QPS
Offline Traffic (sync)	Some	No	Some
Online FS Access (SAMBA, FUSE)	No	Yes	Yes
Data Injection (LHC)	Yes	Yes (for write)	No
Browser Traffic	No	Yes	No

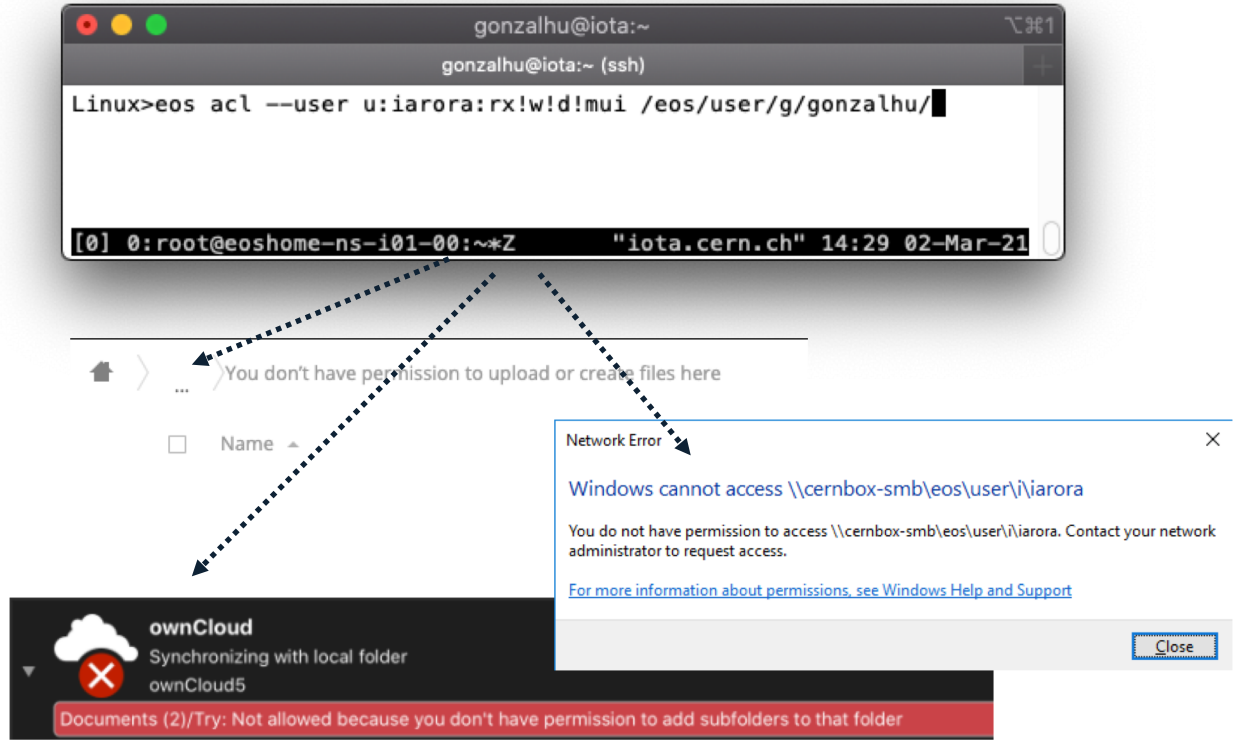
QPS = queries per second
Reactivity as opposite of latency

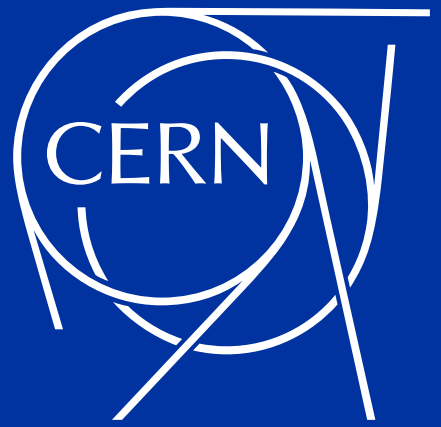
Challenges: ACL Semantics

Consistent views



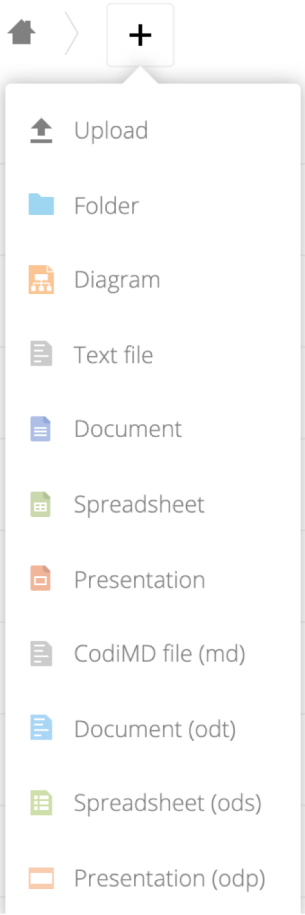
With great power comes great responsibility





Major Working Areas: Real Time Collaboration

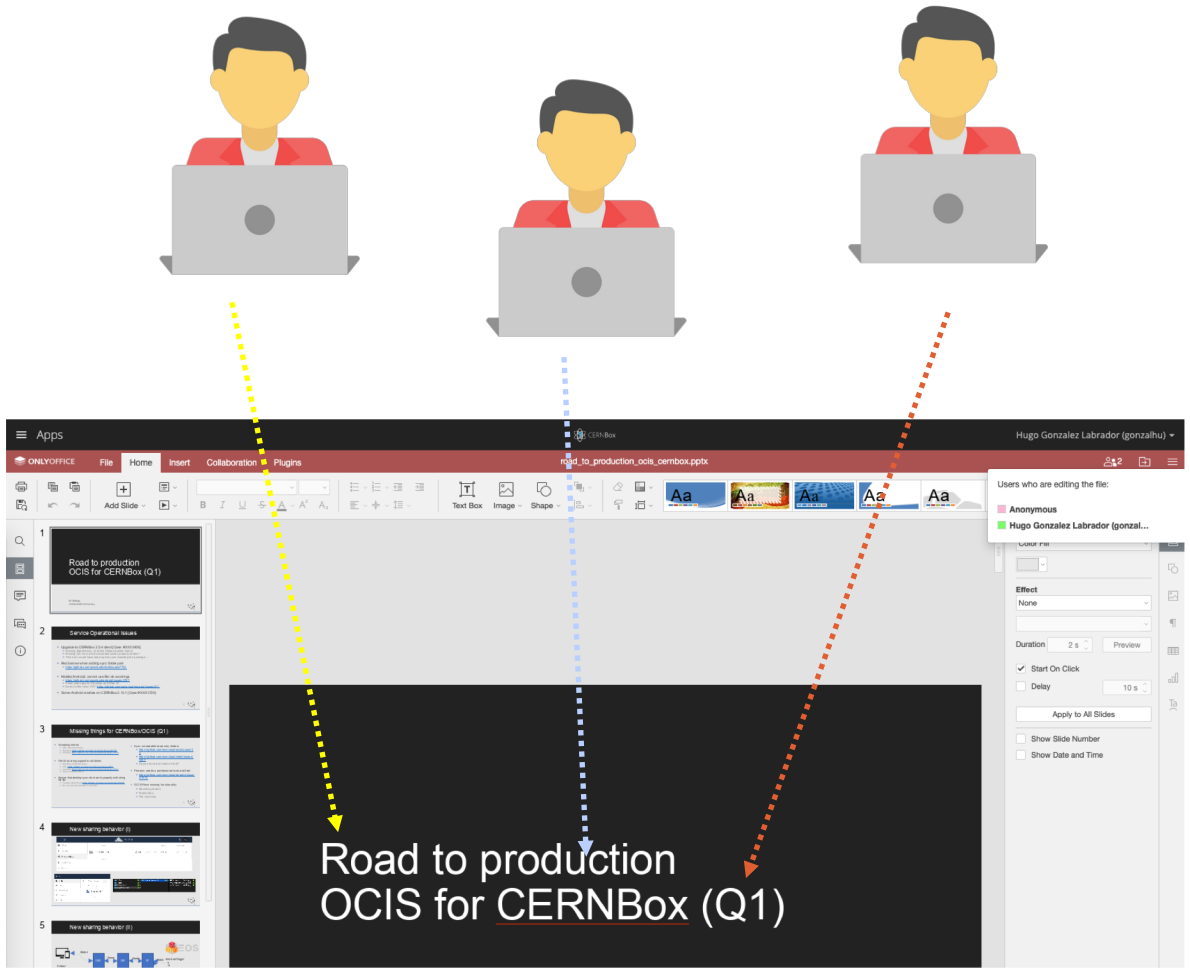
Real Time Collaboration



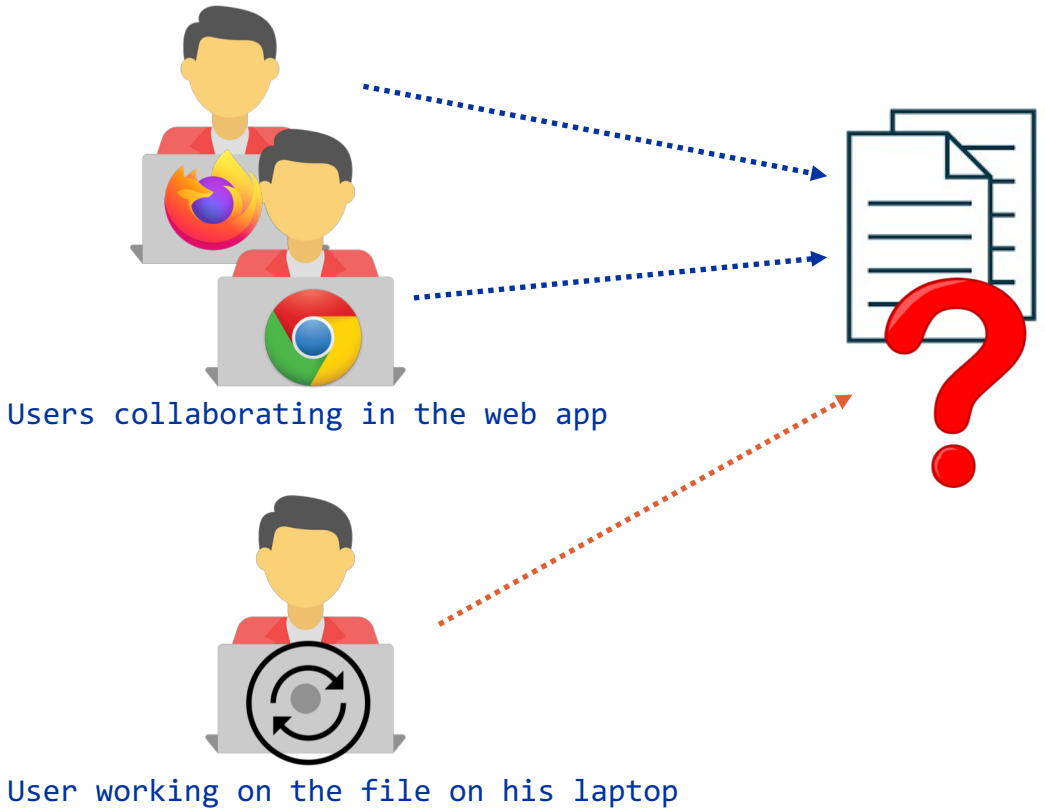
ONLYOFFICE

Collabora

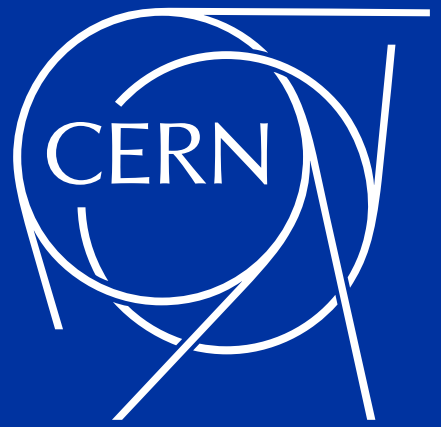
CodiMD



Challenges: Collaboration from any device



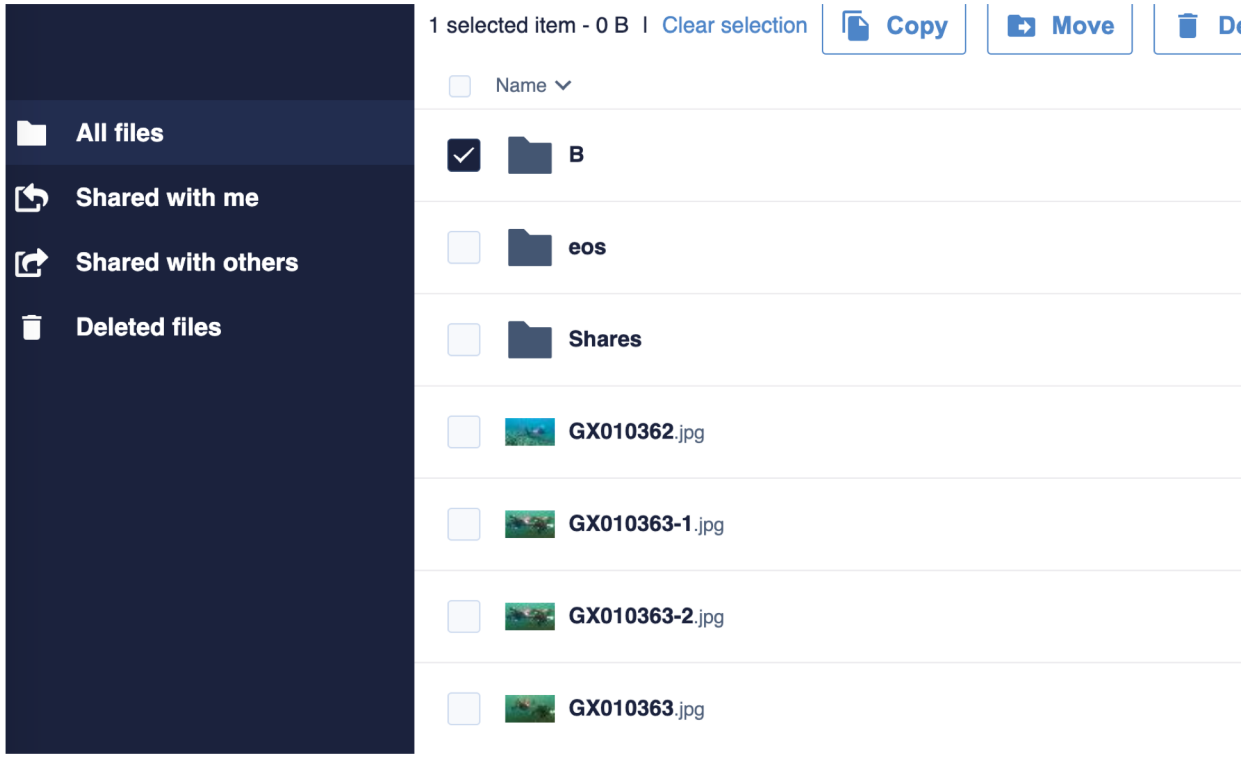
- **Unfortunately, most applications do not consider these scenarios because they believe they have the ownership of the data**
- Multi-lock support for Office offline and online applications in CERNBox – Giuseppe – Wed @ 16:40



Major Working Areas: Usability

Main focus for 2021 is increasing usability

- New UI with more functionalities
- Global URLs
- Automatic synchronization of shares and projects
- Single File Sharing
- Restrictive ACLs
- Lightweight/Guest accounts
- Better management for Project Spaces

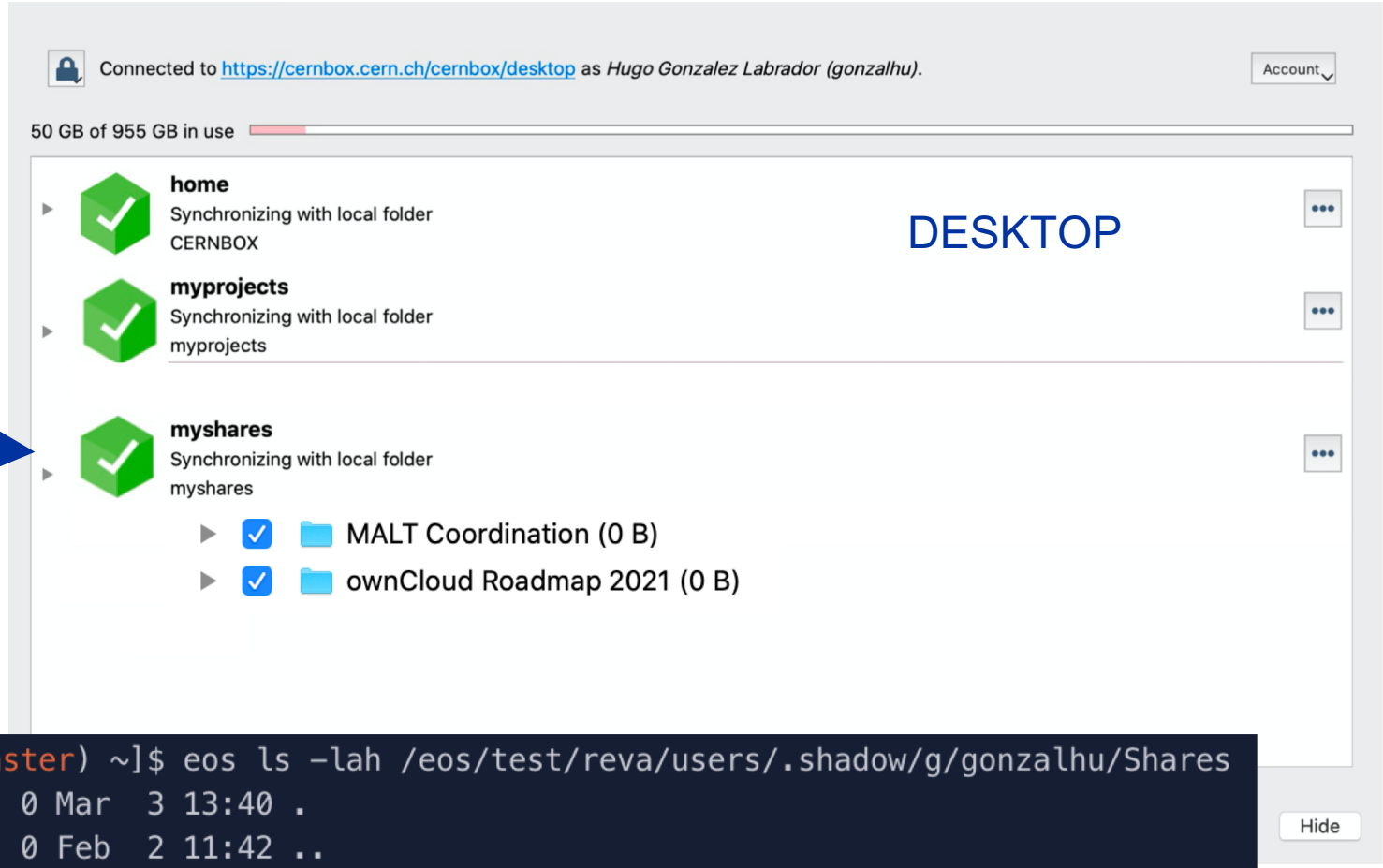


Uniform Global URLs

Automatic sync of shares and projects

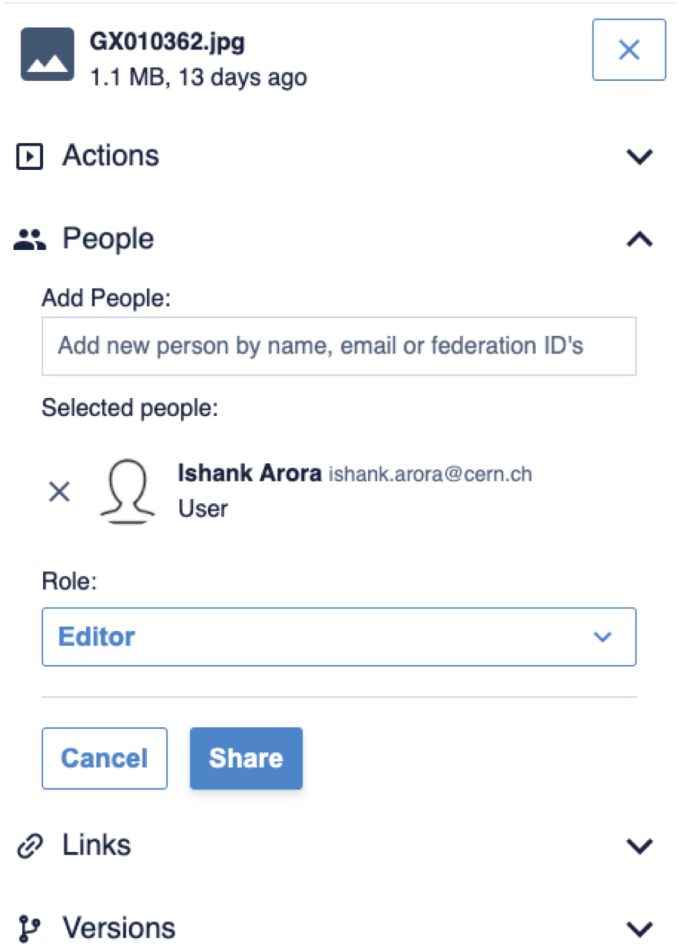
WEB

DESKTOP




```
[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
```

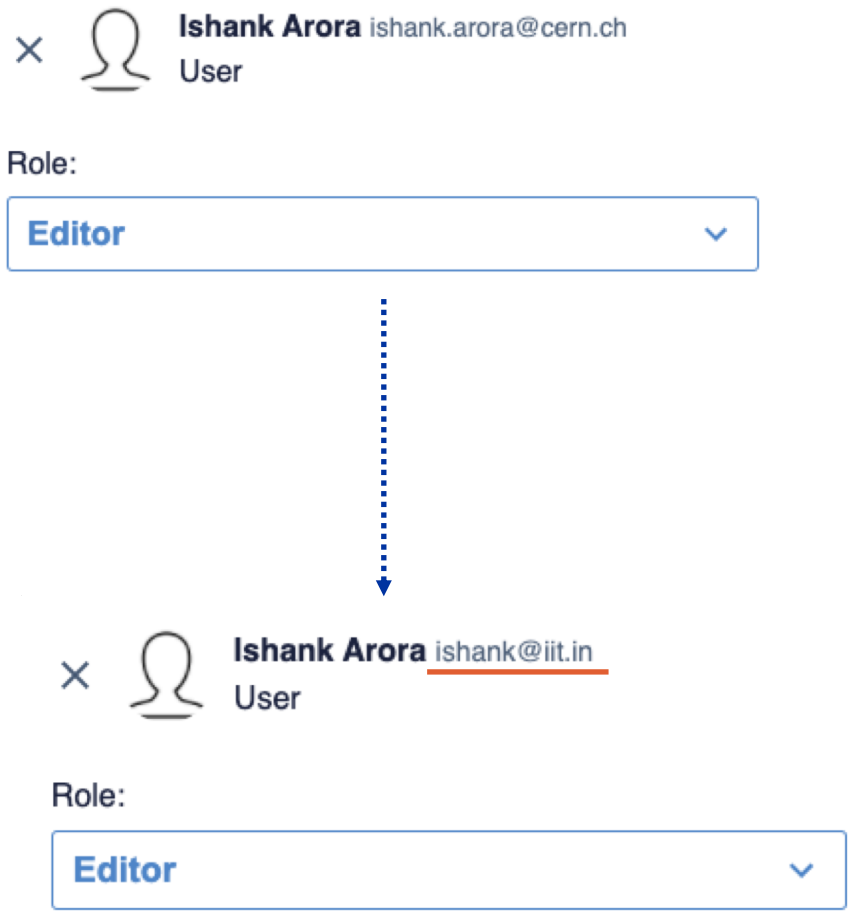
Single File Sharing



EOS recently added support to define ACLs on files also.

This allows for unified view across platforms as we currently do with folders

Lightweight Account Support



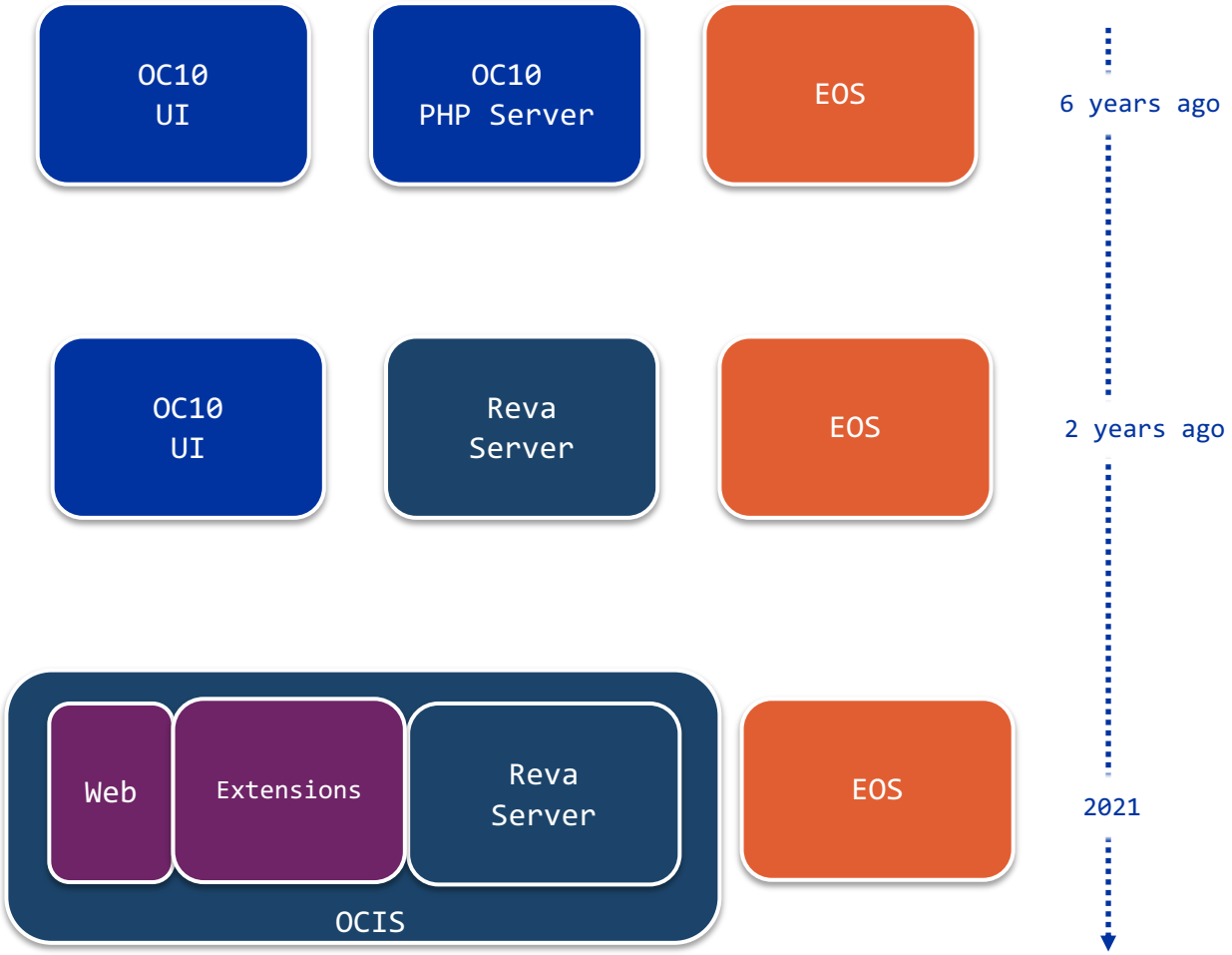
Collaboration at CERN spawns beyond CERN boundaries, involving many external institutions

Users currently use public links to collaborate with external entities but this model does not scale up after a few links

CERN allows end-users to create a lightweight account using EduGain or Social logins.

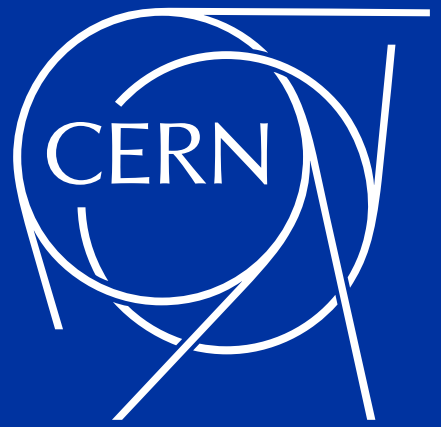
EOS integration with lightweight accounts and OAUTH2 is to be explored

ownCloud Infinite Scale (OCIS)



OCIS is a more flexible system that will allow us to bring to life these usability improvements

OCIS uses the Reva framework (used at CERN since 2 years) so OCIS should cope with our current production loads

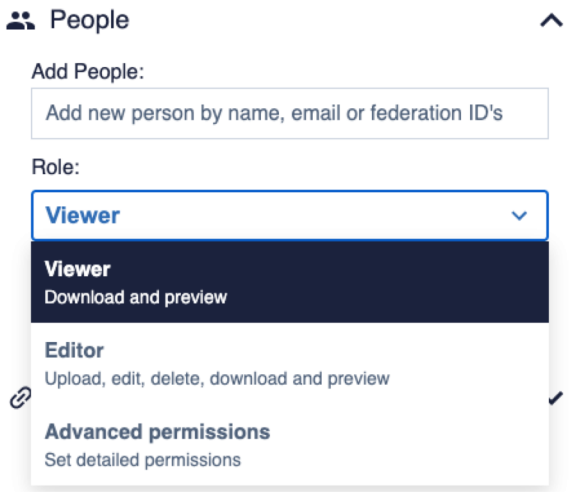


Horizon 2030

Roles for Authorization

Application details | SSO Registration | **Roles** | Group memberships

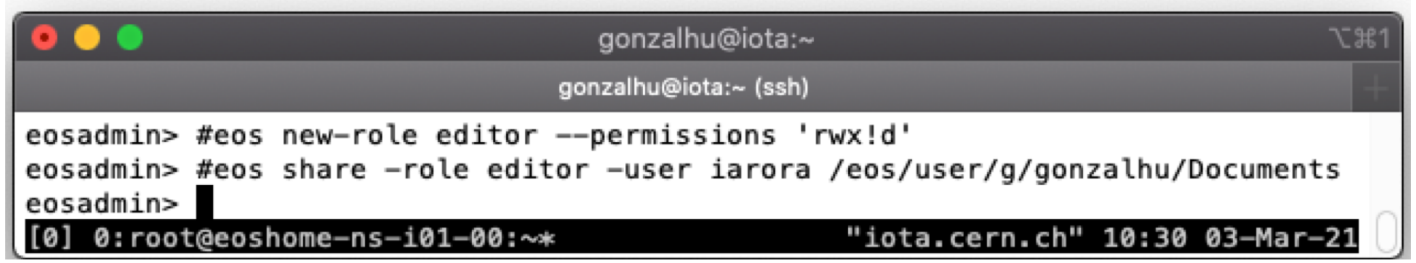
Name	Role Identifier	Description	Required?
CERN Personnel	cern-personnel	CERN Personnel - Members and Associate Members	✔
CERNBox Admins	cernbox-admins	Users with admin privileges	
Default Allowed Users	default-role	Users must be from CERN or eduGAIN to have access	✔



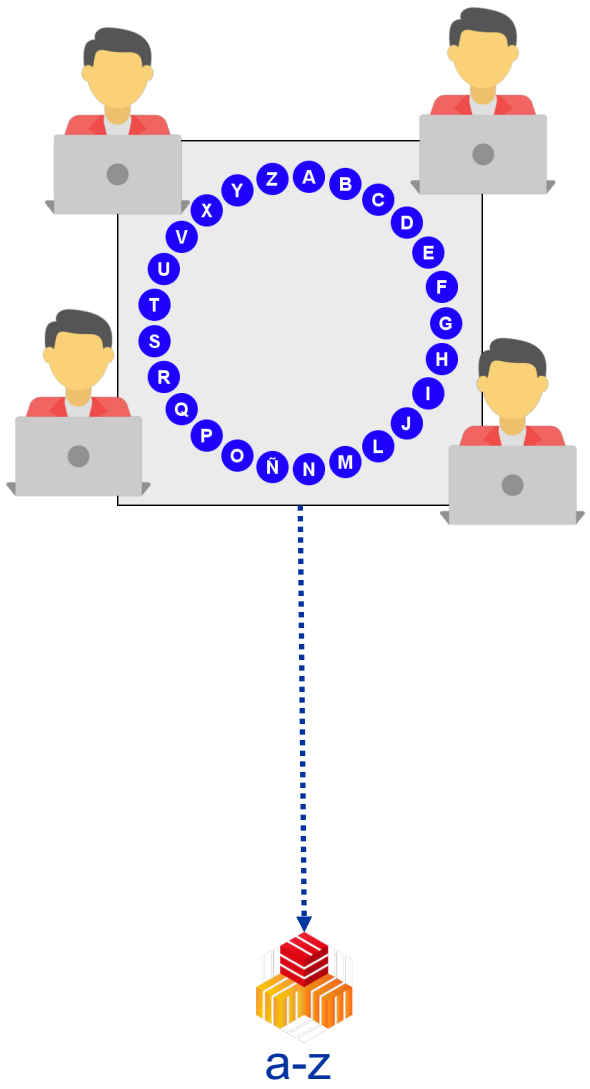
Roles
In AAI

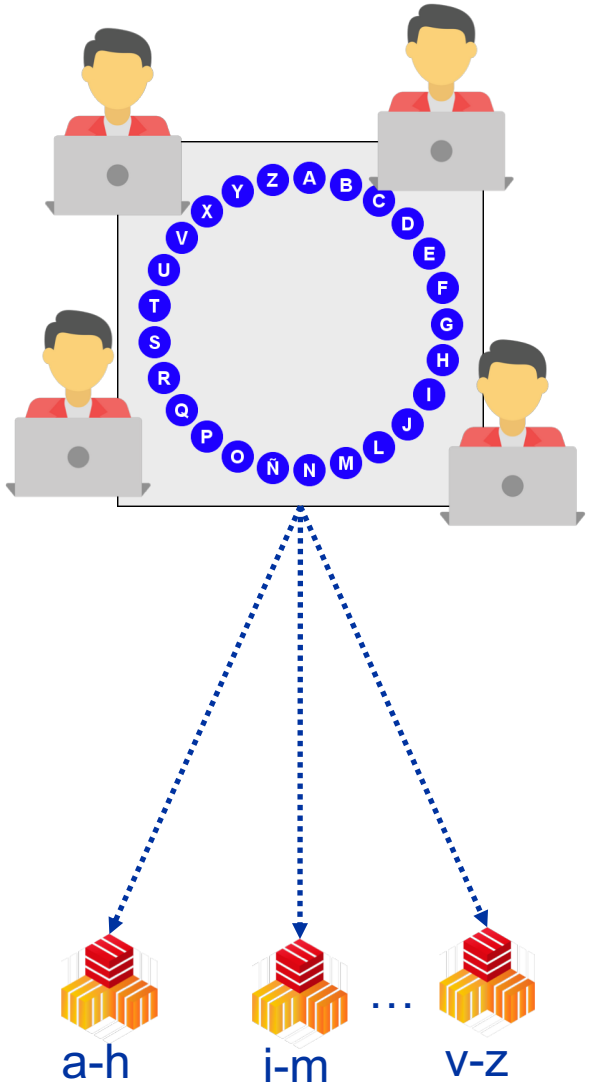
uid:1234:rwx!d!m

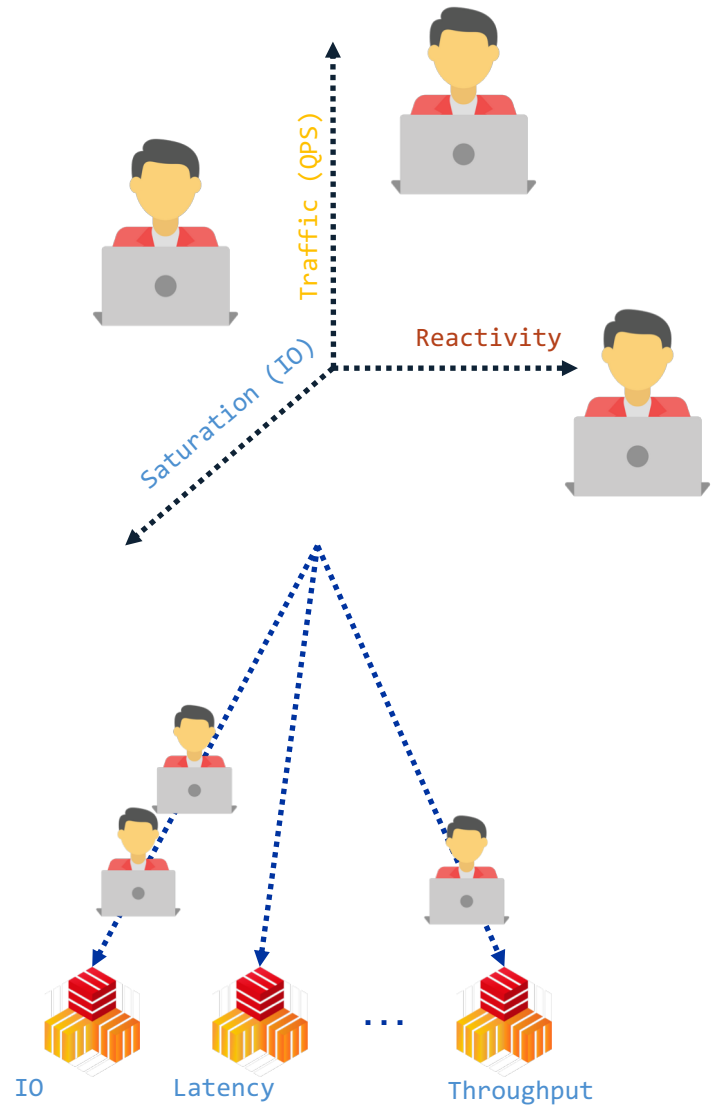
Roles
in Sync&Share
Platforms



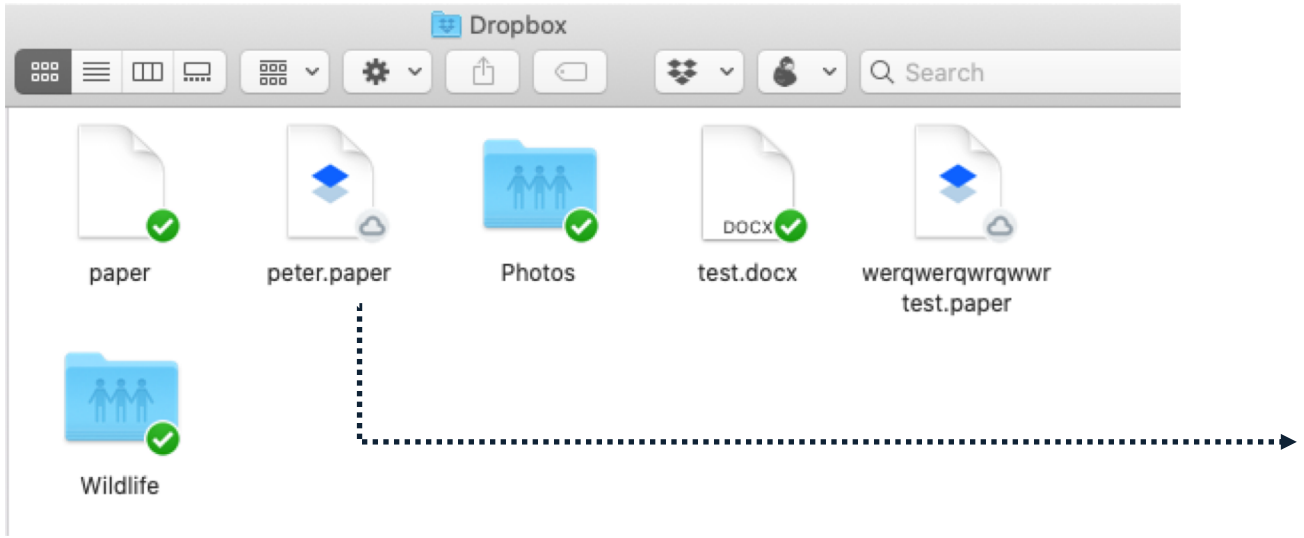
Organic Quality of Service



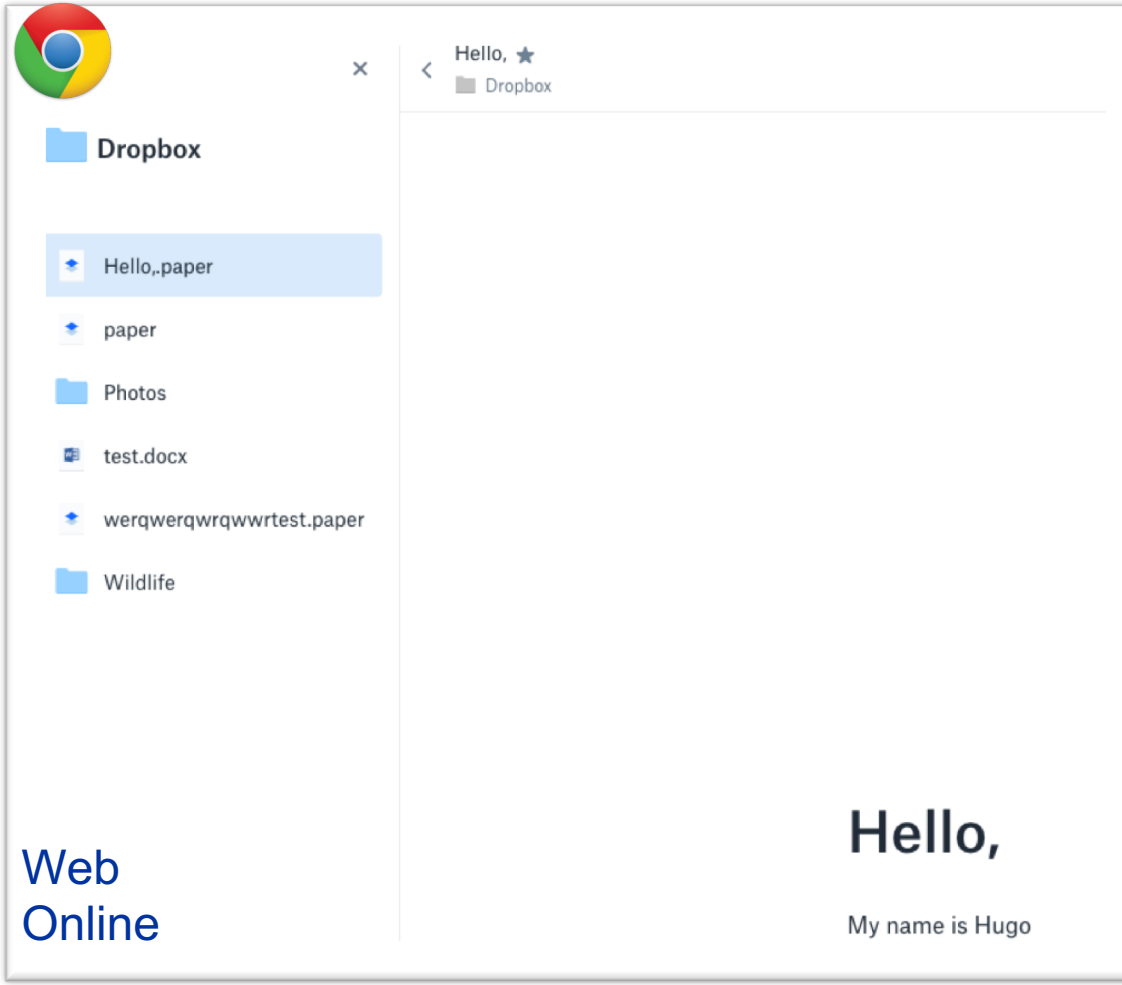




Blend local/offline with remote/online environments

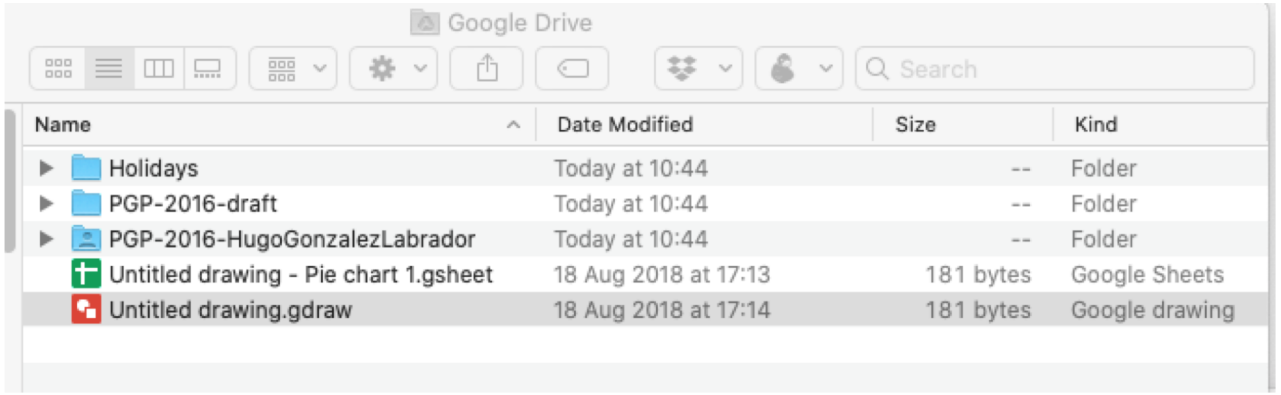


Local filesystem
Offline

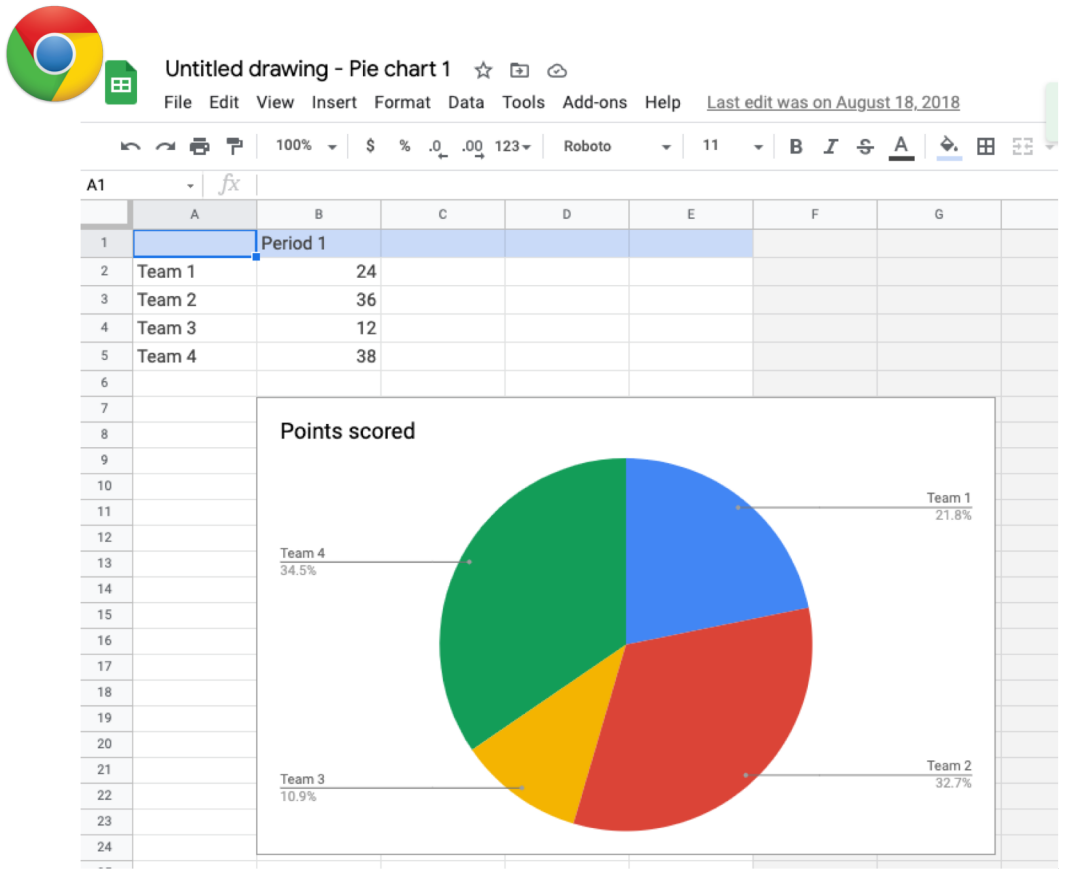


Web
Online

Blend local/offline with remote/online environments



Local filesystem
Offline



Web
Online

We need a long-term strategy for online collaboration

Traditional formats

Microsoft® Word

Microsoft® PowerPoint

Microsoft® Excel

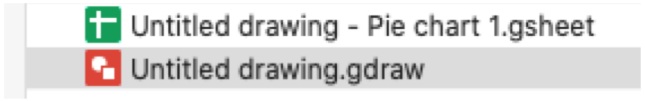
Microsoft® Project

Microsoft® Visio

Office 365

200 million users

New formats



peter.paper

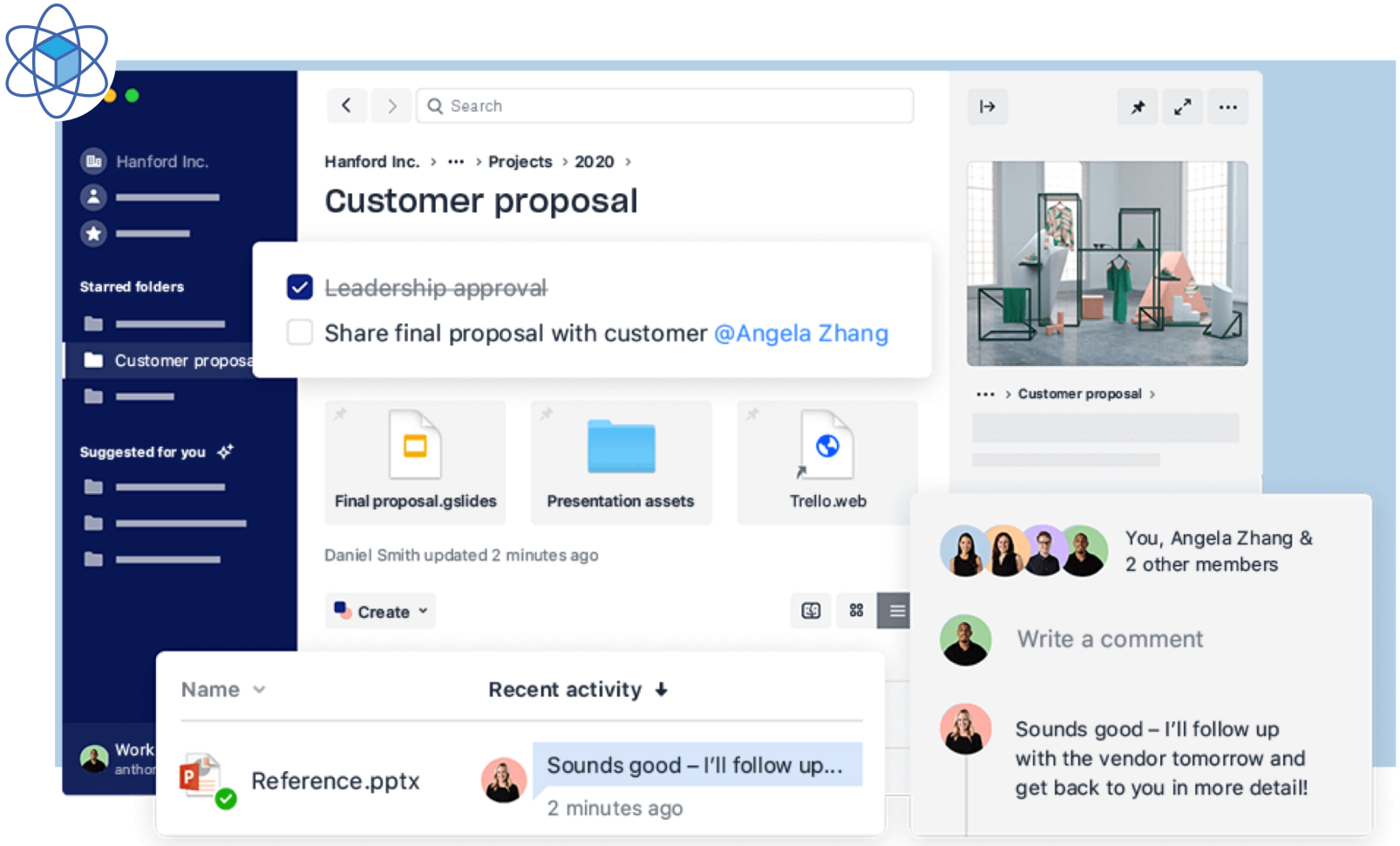
G Suite

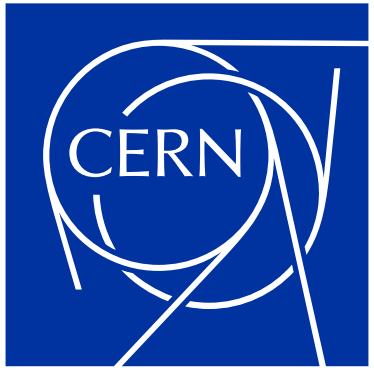
2 billion users

Dropbox

600 million users

CERNBox 2030: everything you need in one place





home.cern