



# CERNBox

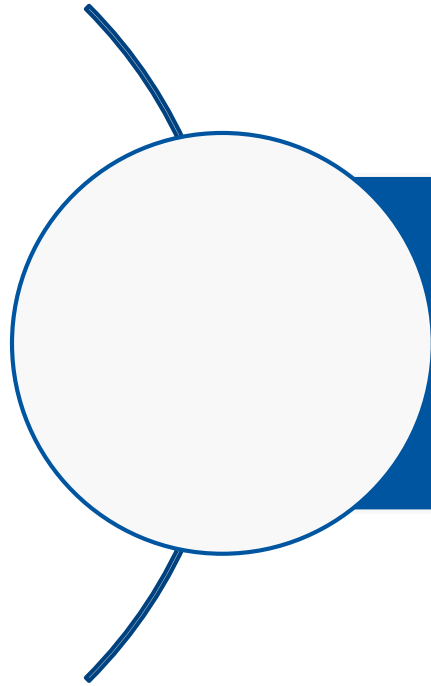
## The CERN Cloud Storage Hub

Hugo González Labrador – Storage Group  
On behalf of the CERNBox Team



# Outline

- 
- Description and Architecture
  - User Community and Service Numbers
  - New Features and on-going work
  - Overview and summary

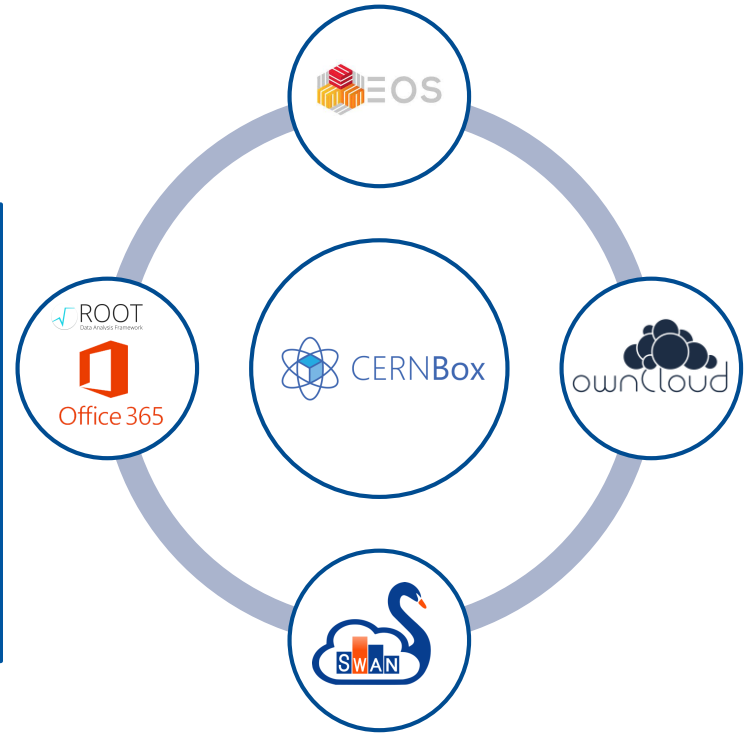


# Description and Architecture

# What is CERNBox ?

CERNBox provides a cloud synchronization and sharing service

- Available for all CERN Users (1TiB/user)
- Synchronize files (data at CERN) and offline data access
- Easy and convenient way to share data across users and groups
- All major platforms supported
- Based on **ownCloud**, powered by **EOS**
- Integrated with **SWAN**



# What is CERNBox ?



POSIX Filesystem

XROOTD

WebDAV

Sync

Sharing

Mobile

Web

Hierarchical Views



Access Control Lists



Physical Storage

# What is CERN EOS?



## **Providing large-scale disk storage at CERN**

14:45 - 15:00

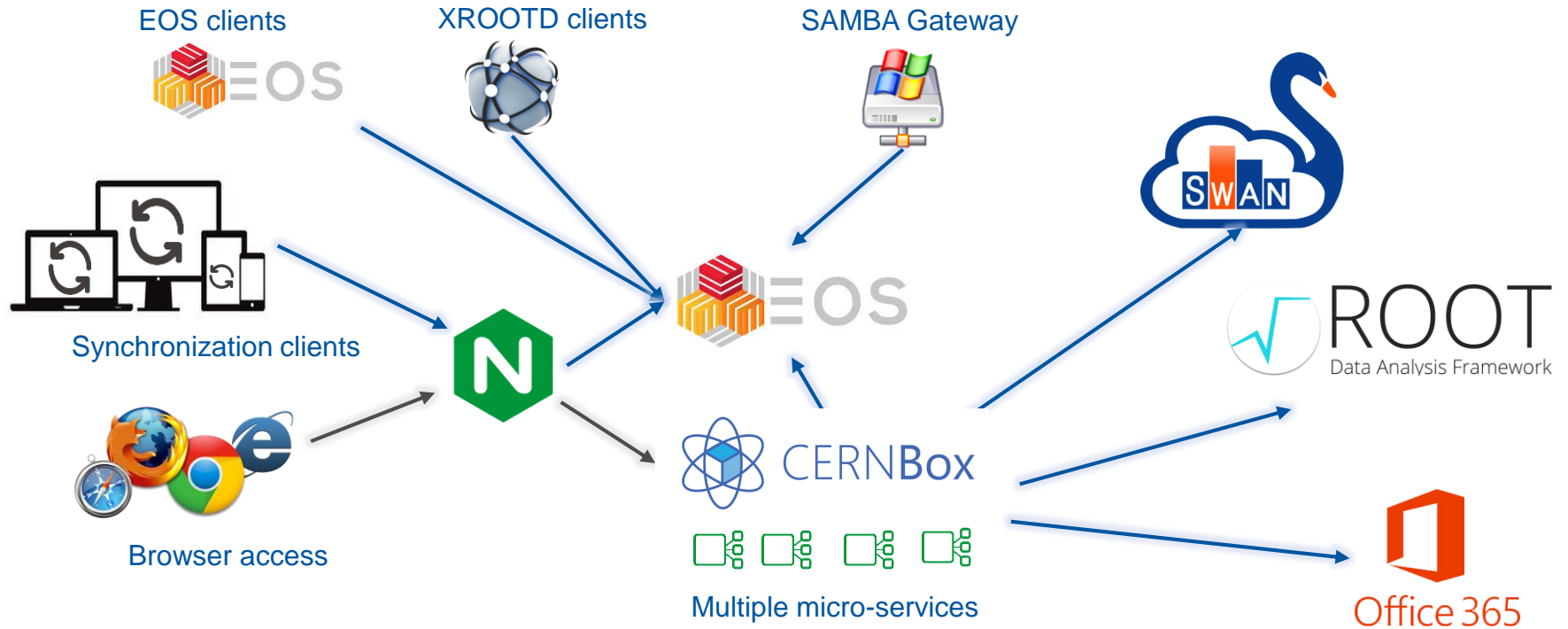
<https://indico.cern.ch/event/587955/contributions/2936837/>

## **Scaling the EOS namespace**

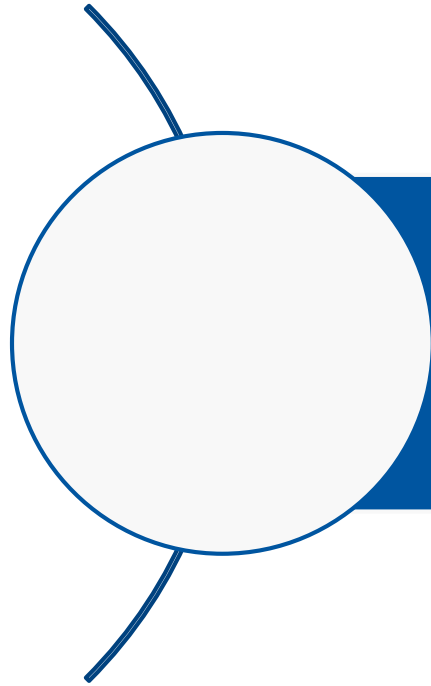
15:00 - 15:15

<https://indico.cern.ch/event/587955/contributions/2936873/>

# CERNBox Architecture



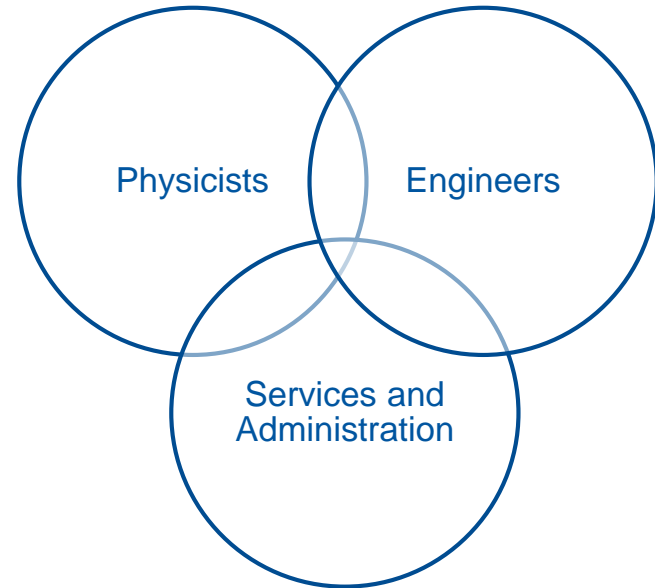




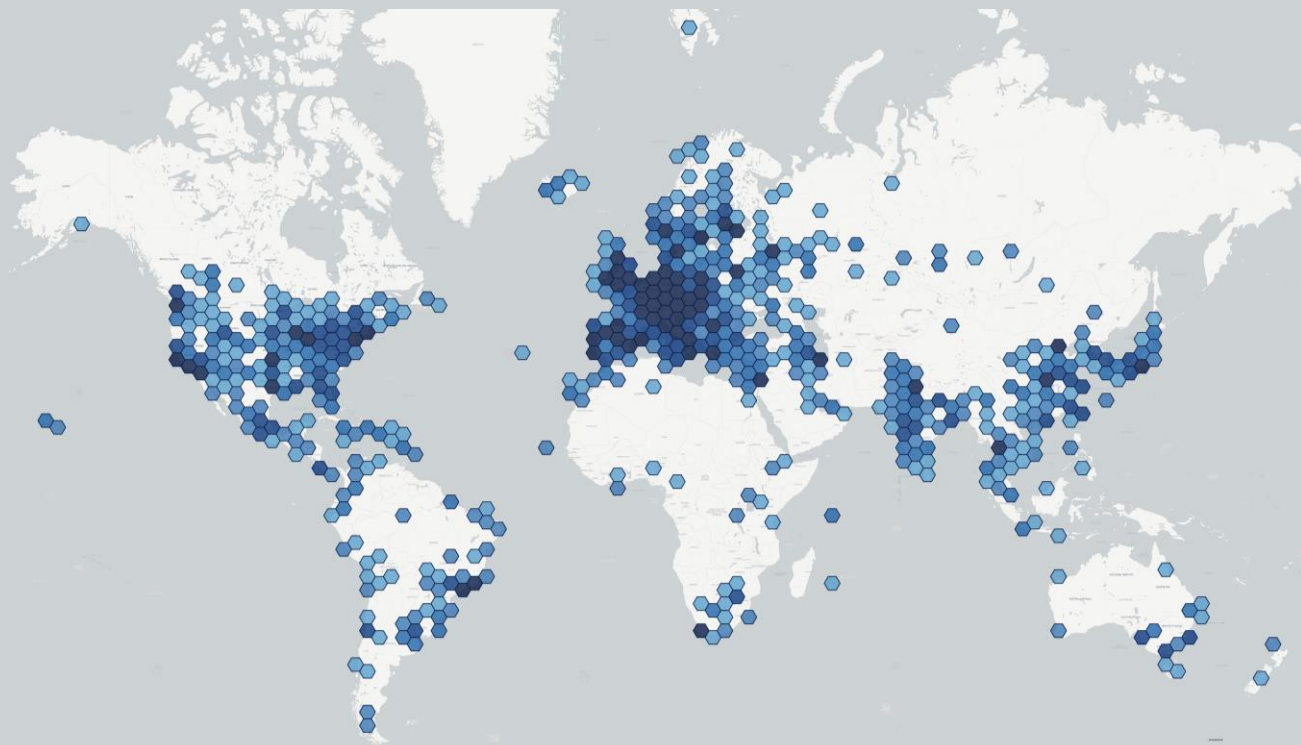
# User Community and Service Numbers

# Service Numbers

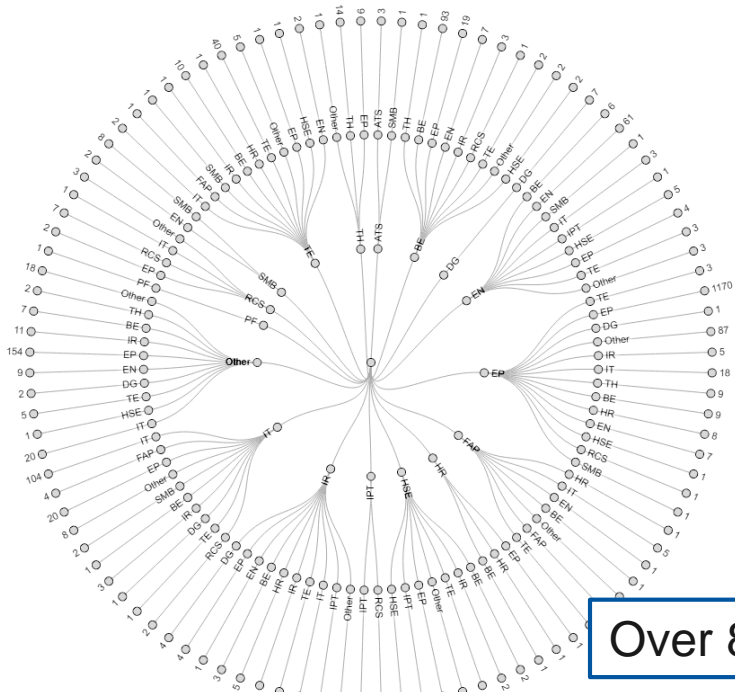
	Jan 2016	Jan 2017	Jan 2018	<i>Jul 2018</i>
Users	4074	8411	12686	<b>14805</b>
# files	55 Million	176 Million	470 Million	<b>604 Million</b>
# dirs	7.2 Million	19 Million	34 Million	<b>41 Million</b>
Used Raw Space	208 TB	806 Terabytes	2.5 Petabytes	<b>3.47 Petabytes</b>
Deployed Raw Space	1.3 PB	3.2 Petabytes	5.7 Petabytes	<b>5,9 Petabytes</b>



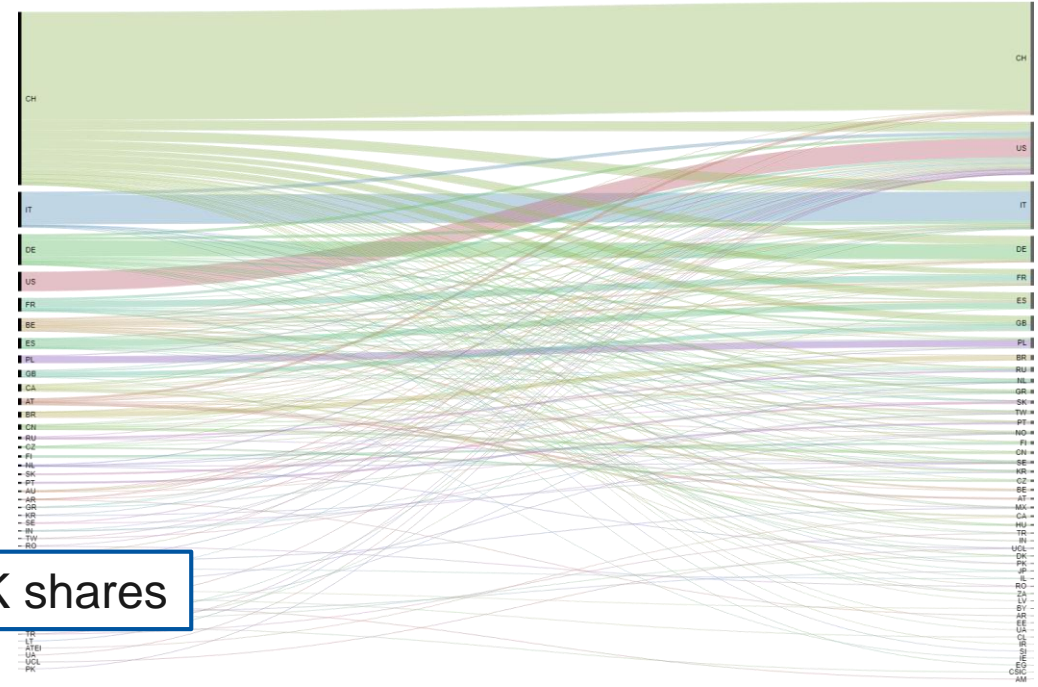
# Distributed Users

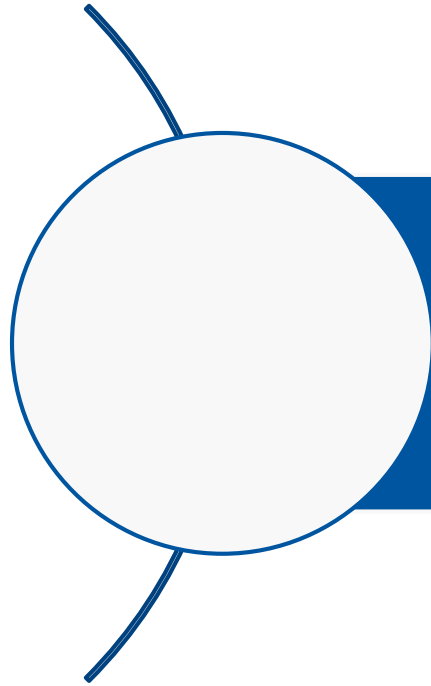


# Collaboration



Over 80K shares





# New Features and On-going Work

# New UI for CERNBox



## *Petabyte-Scale Cloud Storage File Manager*

The screenshot shows the ownCloud web interface. At the top, there is a dark blue header with a menu icon, the text "FILES", the ownCloud logo, the text "ownCloud", a search icon, and a user profile icon for "ELLEN RIPLEY". Below the header is a light gray navigation bar with a home icon, the text "/ Home", "5 Results", and a "FILTER" button. The main content area is a table with columns for "NAME", "SHARED WITH", "OWNER", "SIZE", and "DATE". The table contains four rows of data: "Books" (shared with bill.murray@fillmurray.com & Steven Segal, owned by James Woods, 318.47 MB, a year ago), "Games" (owned by Nicolas Cage, 225.84 MB, 2 years ago), and "Music" (owned by Steven Segal, 128.11 MB, 4 years ago).

<input type="checkbox"/>	NAME	SHARED WITH	OWNER	SIZE	DATE
<input type="checkbox"/>	Books	bill.murray@fillmurray.com & Steven Segal	James Woods	318.47 MB	a year ago
<input type="checkbox"/>	Games		Nicolas Cage	225.84 MB	2 years ago
<input type="checkbox"/>	Music		Steven Segal	128.11 MB	4 years ago



# Collaborative platform

Name	Size	Modified
CERNBox	0 kB	3 minutes ago
CERN visit.doc	98 kB	a year ago
CERN-2016-EN.pdf	204 kB	a year ago
Machine Retirement.xls	16 kB	6 months ago
Storage-Discussion.ppt	3 MB	2 months ago

**COLLABORA**

### The CERNBox apps ecosystem

- From High Energy Physics ...
- Started as on premise cloud storage
- More and more integrating new ways to interact with your data
- ...reaching out to Scientific and Cloud Computing
- Microsoft Office integration
- Galleries (pictures as well as ROOT histograms)
- Notebooks (SWAN)
- more to come



**ONLYOFFICE**

### cosystem

ways to interact with your data  
Cloud Computing

ROOT histograms)

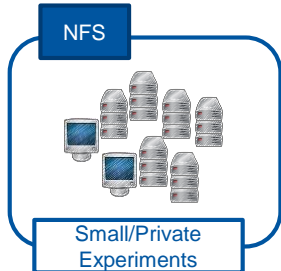
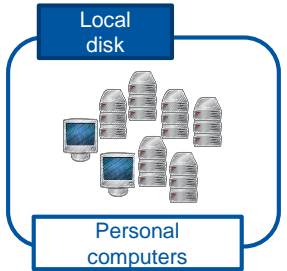
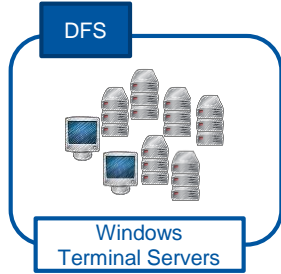
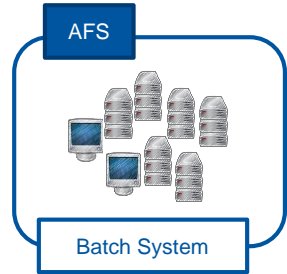
**Office**

### Welcome to OWA

Try to test test test

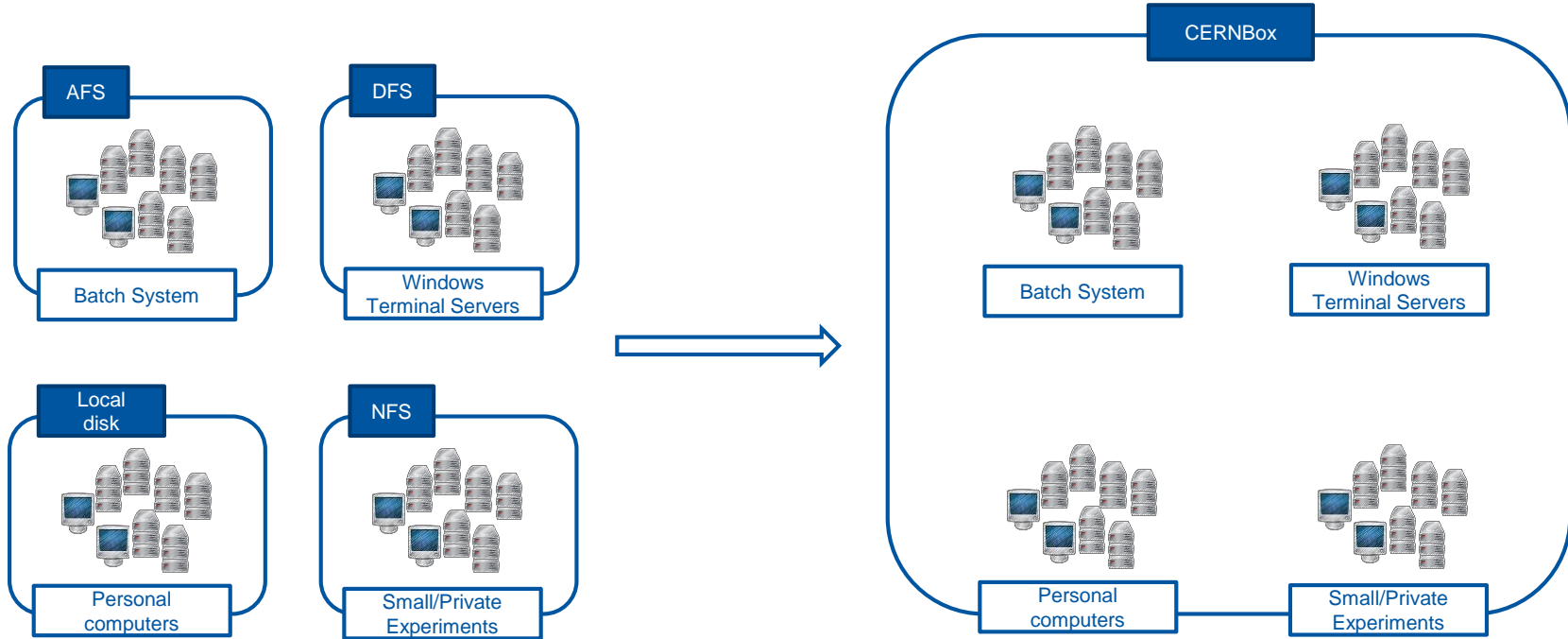


# New Unified Storage Vision

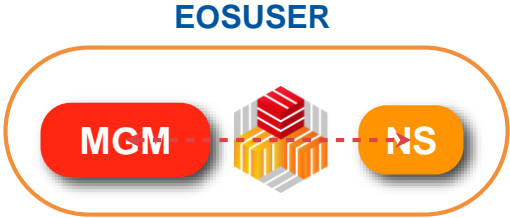
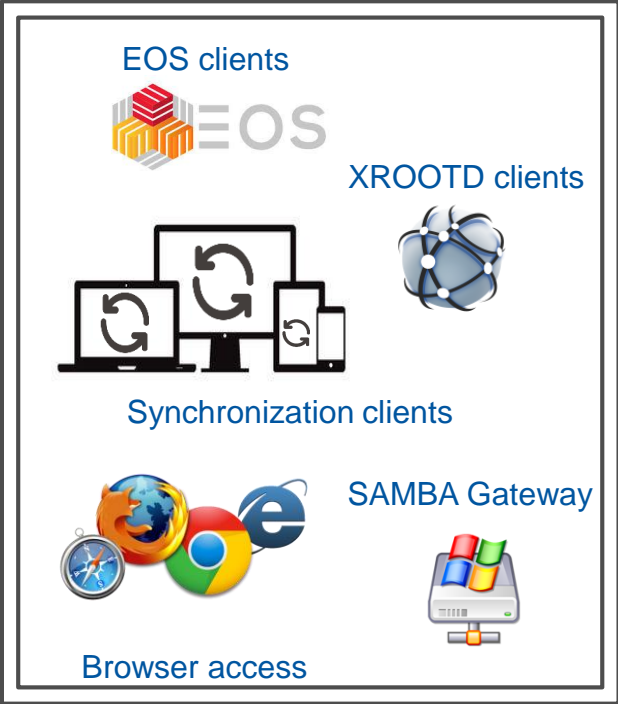




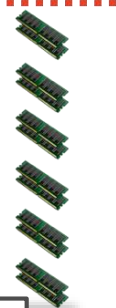
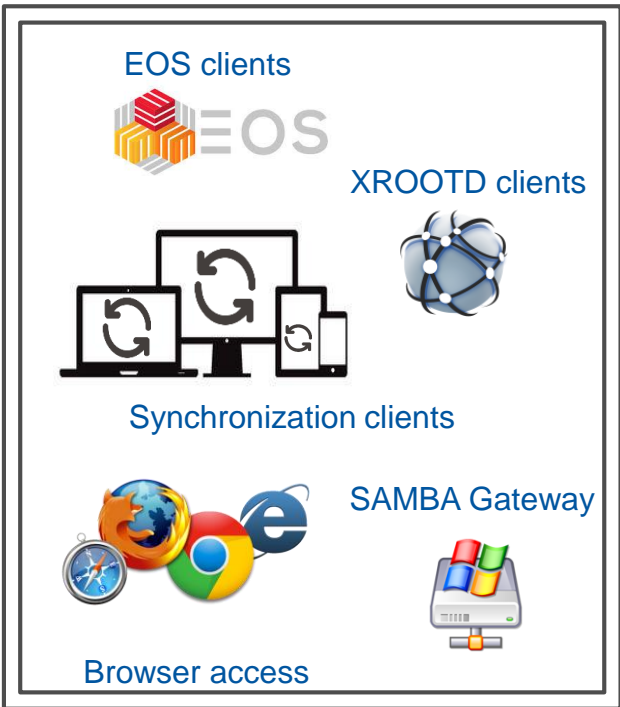
# New Unified Storage Vision



# From EOSUSER to EOSHOME



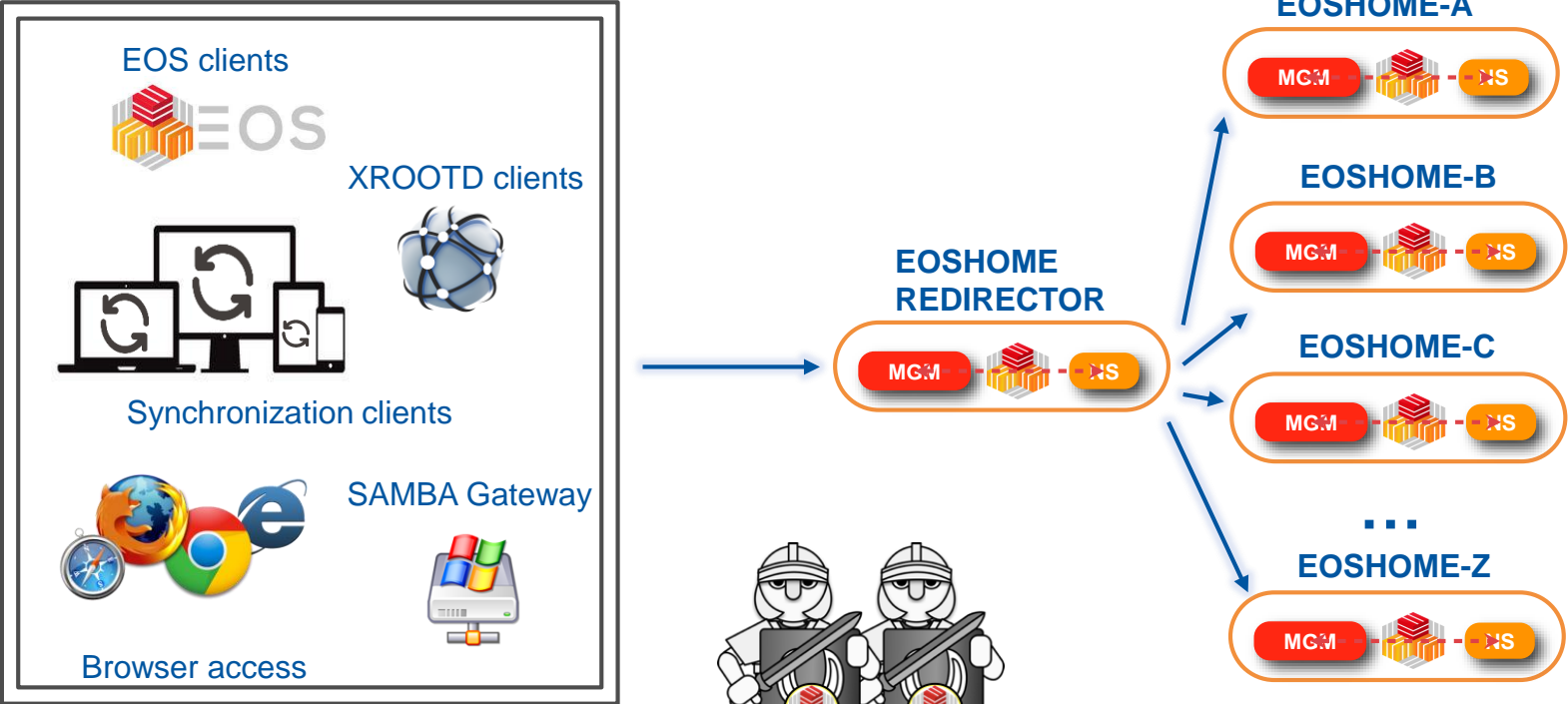
# From EOSUSER to EOSHOME



- Data scale-out
- Namespace scale-out

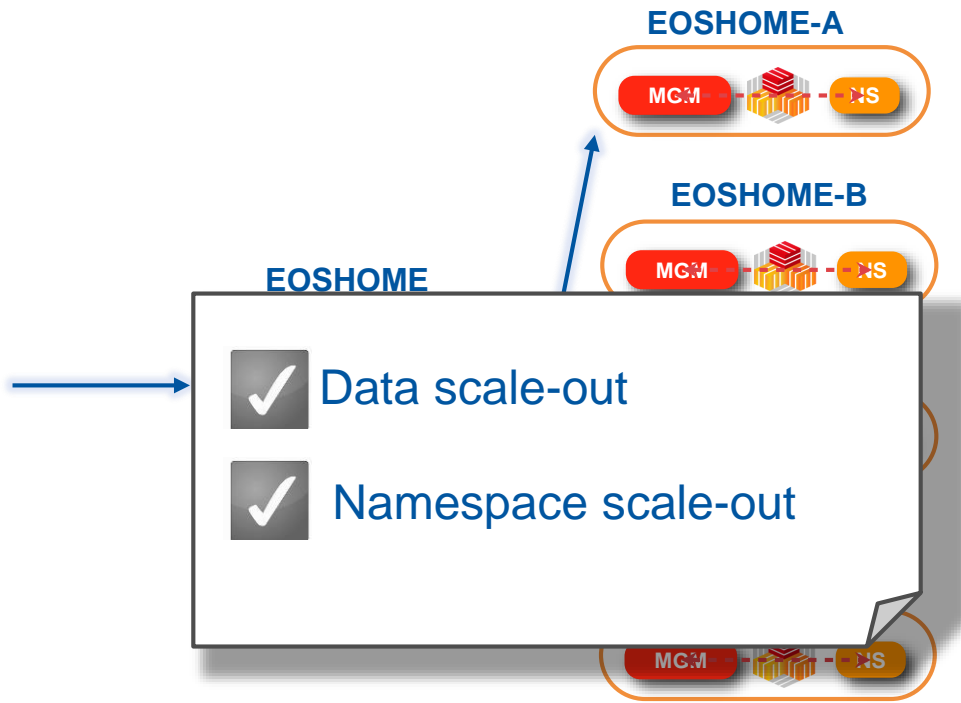
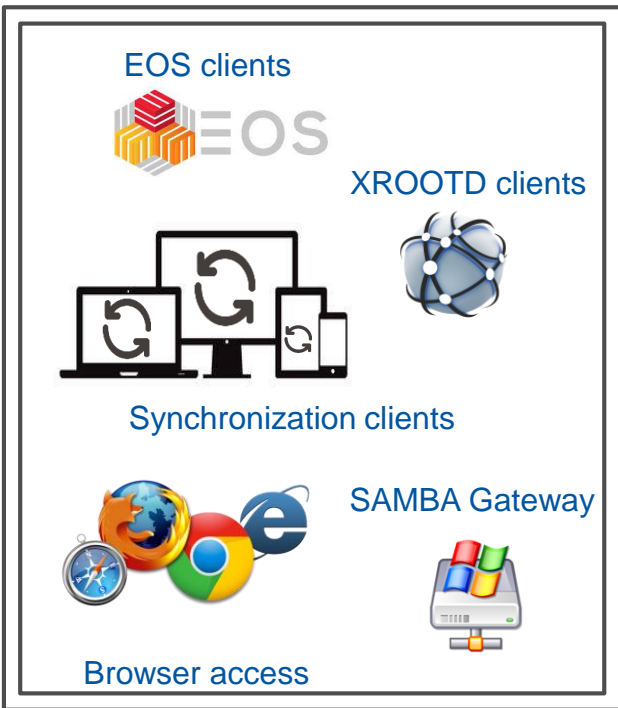
A white box with a drop shadow containing a checklist. The first item, 'Data scale-out', has a grey checkmark icon. The second item, 'Namespace scale-out', has an orange 'X' icon.

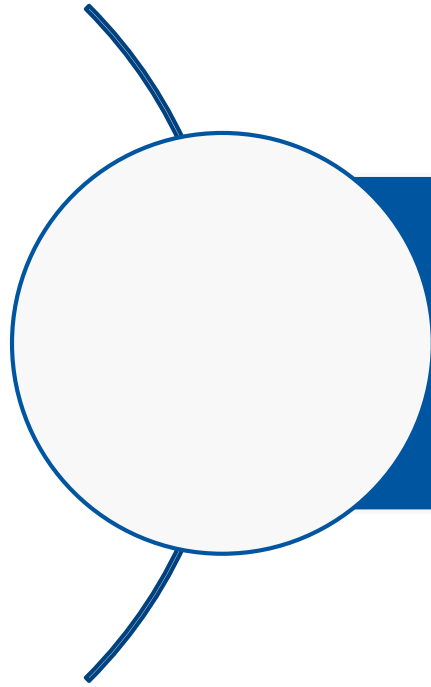
# From EOSUSER to EOSHOME



Divide et Impera

# From EOSUSER to EOSHOME





# Overview and Summary

# Conclusions

- CERNBox plays a key role into the future home directory of CERN.
- From year to year the use of the system is increasing very fast
- Users demand more and more features and integrations into their workflows
- We have a nice collaboration with industry to shape the future of sync and share for HEP uses cases