

## CERNBox

#### **Cloud Storage for Science**

#### Luca Mascetti CERN - IT Storage







- Description and Architecture
- User Community and Service Numbers
- Success Stories & Future Use-cases
- Overview and Summary



Description and Architecture



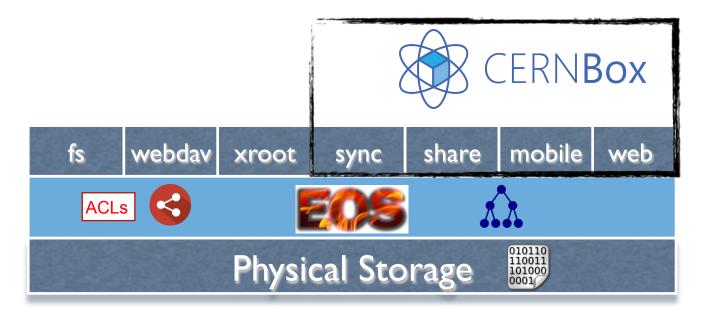
## What is CERNBox ?



CERNBox provides a cloud synchronisation service

- Available for all CERN users (1TB/user)
- Synchronise files (data at CERN) and offline data access
- Easy way to share with other users
- All major platforms supported
- Based on ownCloud integrated with EOS









#### EOS is the CERN disk storage for physics data

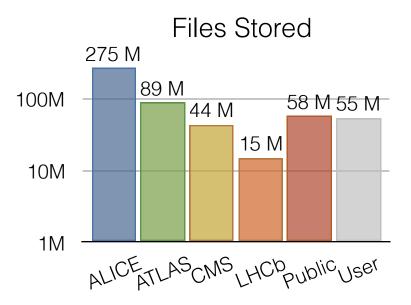
140 PB raw deployed (50% in Budapest)

1'300 storage nodes

40'000 disks



# Usable Capacity (2-replica)

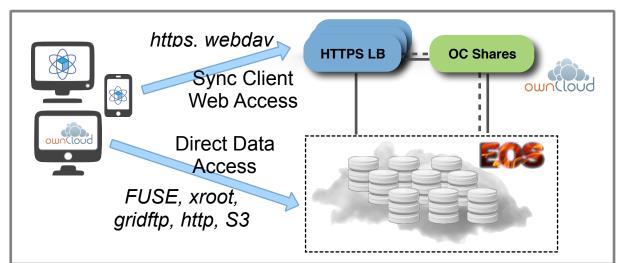








- EOS offers "virtually unlimited" cloud storage for end-users
- Full solution compatible with ownCloud clients
- Remove dependency on the ownCloud Database
  - EOS has a very fast in-memory namespace
- Integrate web-access and sharing, versions, trash bin
- Significant improvement of the external storage concept
  - Great scalability, as good as the underlying backend
- Great performance, efficient hardware usage





#### Access Methods: FUSE

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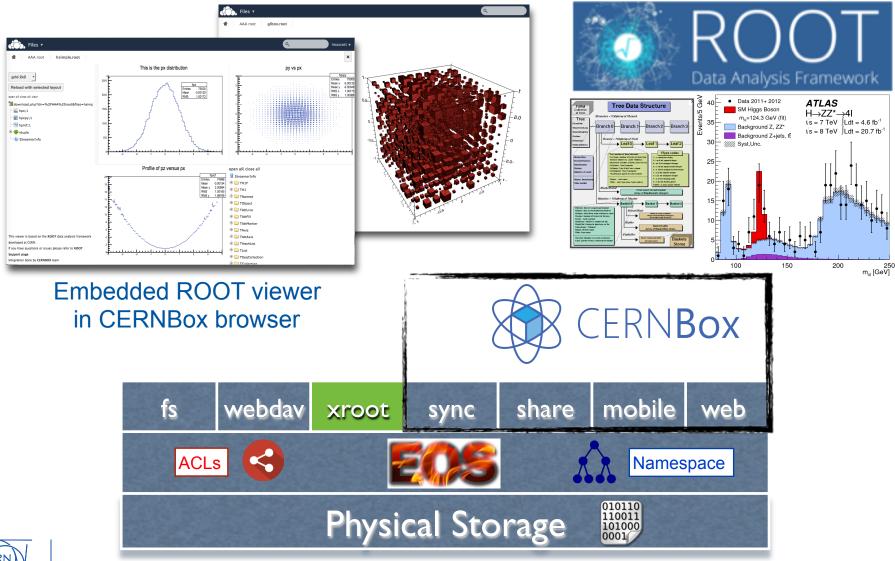


#### Access Methods: WebDAV

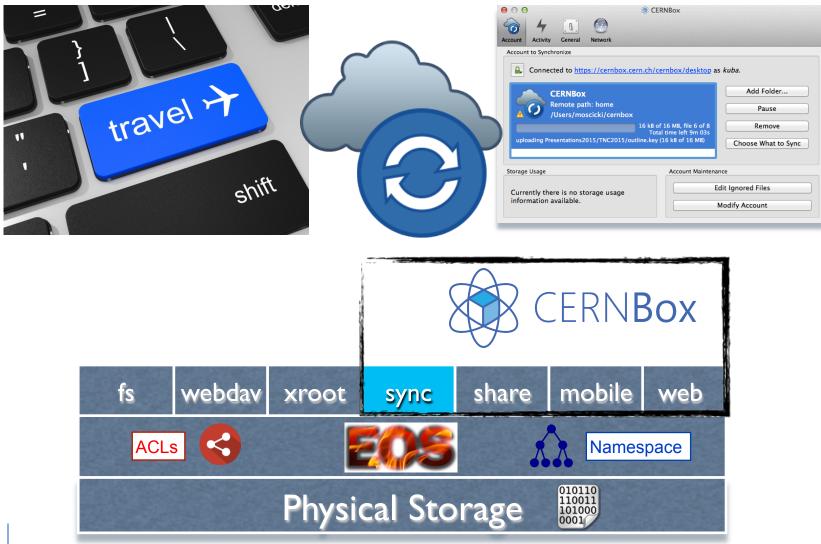
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#### Access Methods: xroot & ROOT

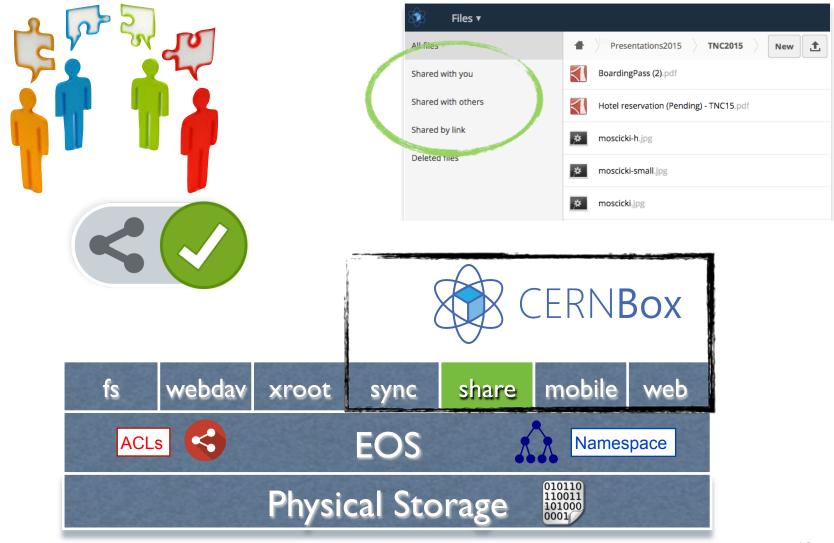


## Access Methods: Sync





## **Access Methods: Sharing**





## Access Methods: Mobile & Web





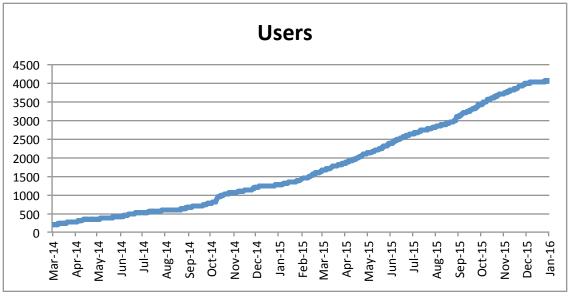
#### User Community and Service Numbers



## **CERNBox Service Numbers**

#### EOS offers "virtually unlimited" cloud-storage for our end-users

Users	4074
# files	55 Million
# dirs	7.2 Million
Quota	1TB/user
Used Space	104 TB
Deployed Space	1.3 PB

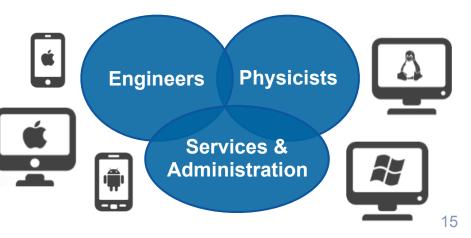


User community very active

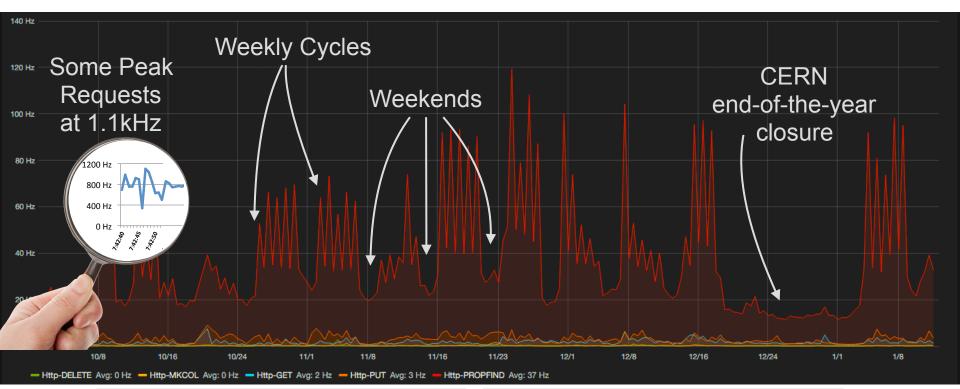
• Very positive feedback

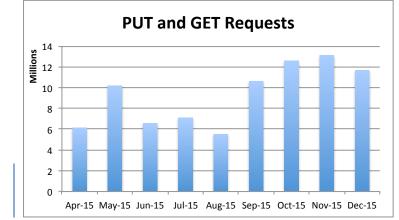
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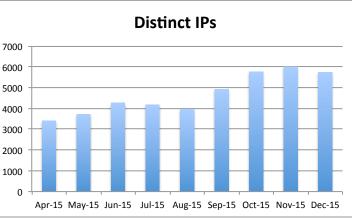
- Several useful suggestions
- Important contributions
- happy to help testing new features



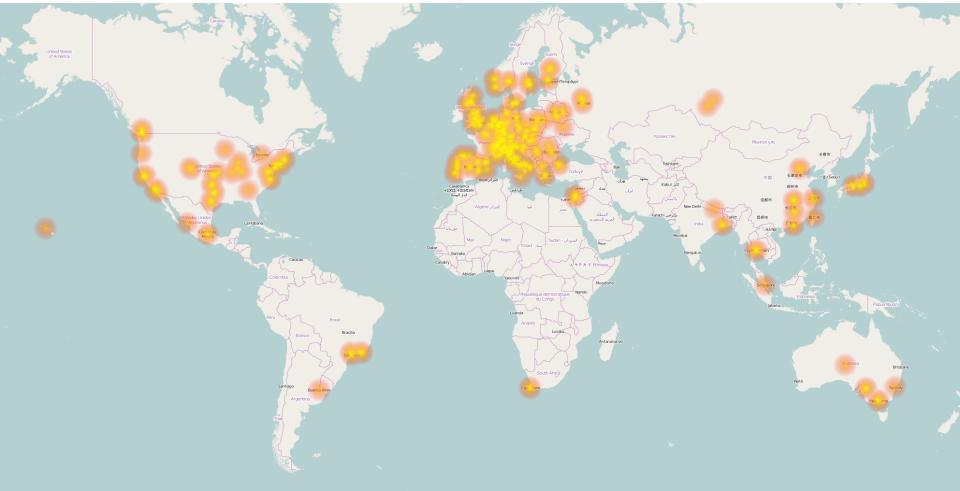
#### **EOS/CERNBox HTTP Operations**







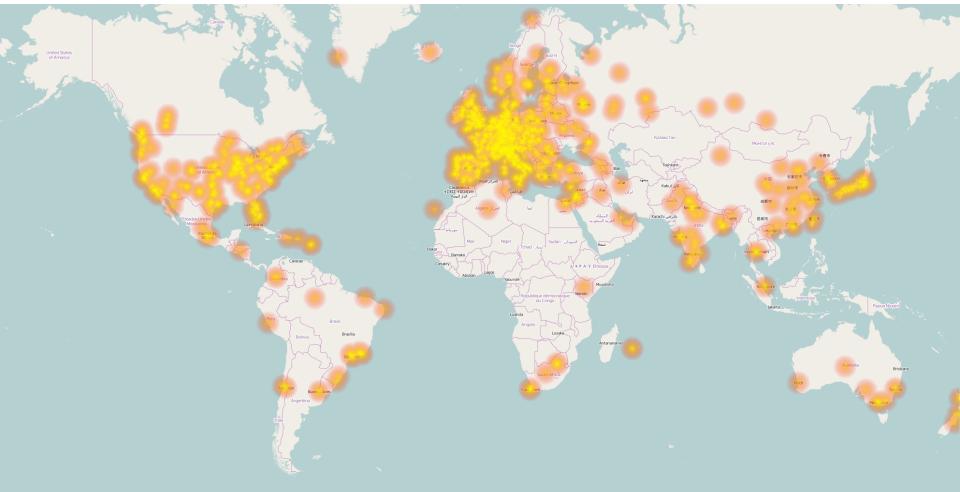
#### **Nov 2015: Geolocation Active Users**



Background © OpenStreetMap & contributors; image available under CC-BY-SA

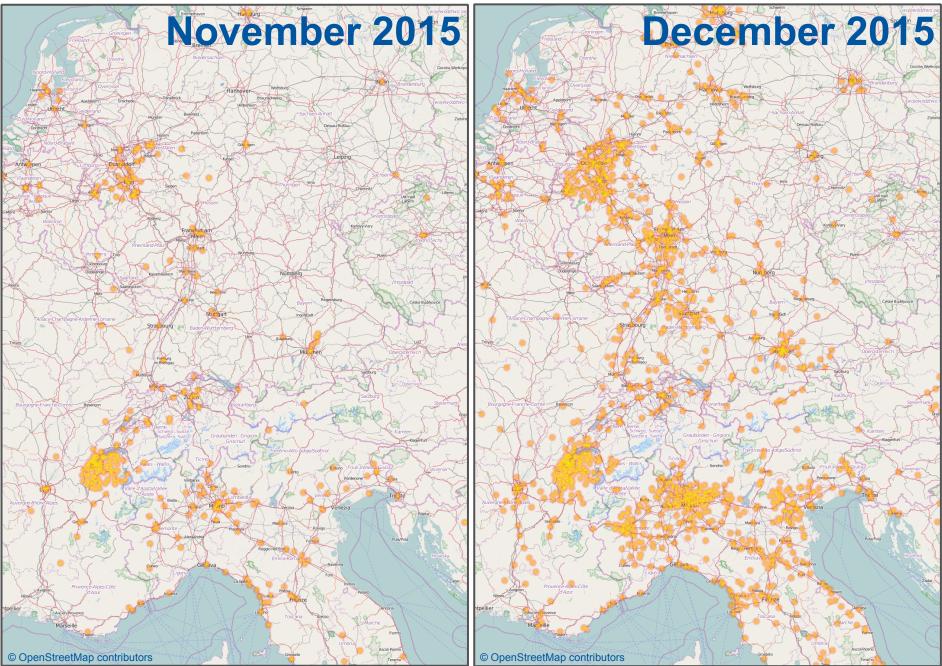


#### **Dec 2015: Geolocation Active Users**



Background © OpenStreetMap & contributors; image available under CC-BY-SA







#### Success Stories and Future use-cases

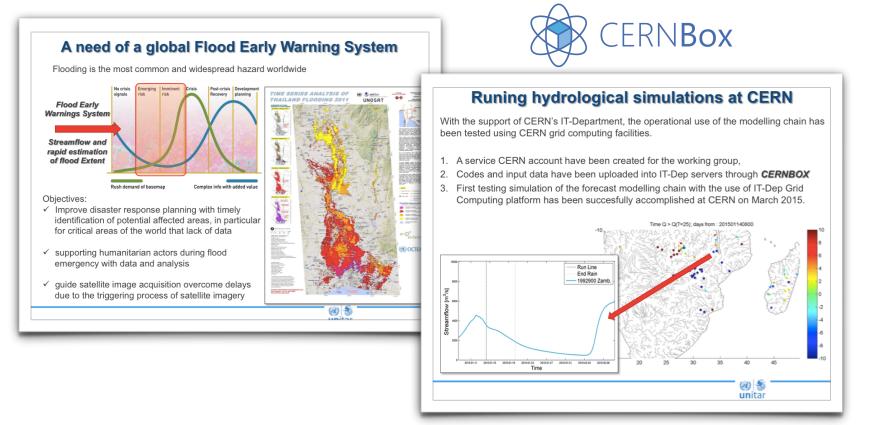


#### **E-Science**



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- Enable non-experts to easily use CERN Storage resources
- Powerful integration with the batch system
- Simple to share result with collaborators



#### **CERN Press Office**

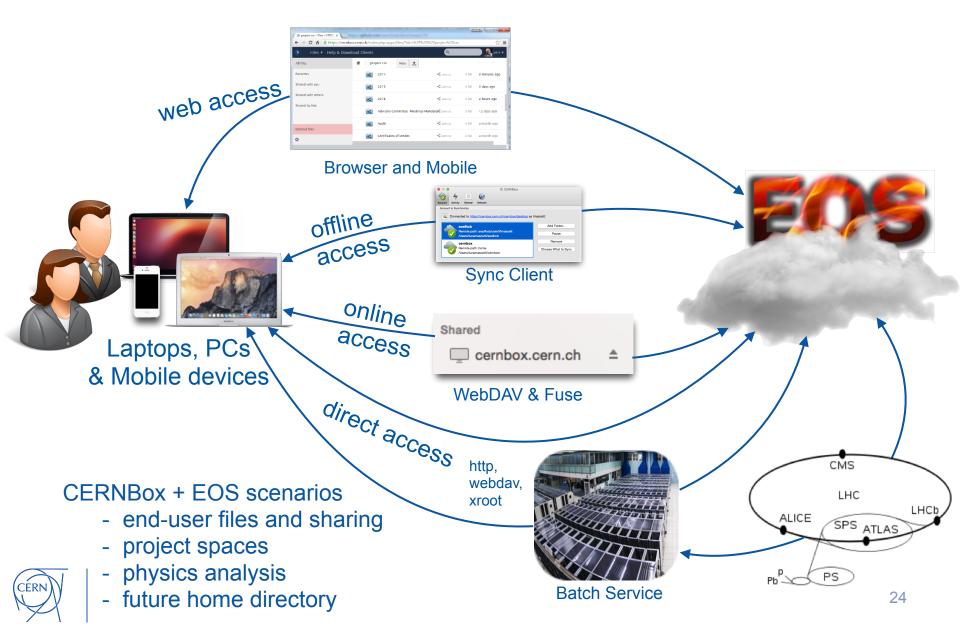


#### **R&D - EOS World-Wide Deployment**

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[root@p05151113837349 ~]#		



#### Future Home Directory (\$HOME)



#### Overview and Summary



## Summary

CERNBOX

- Innovative service
  - Fast growing, very good feedback
- Full integration with LHC petabyte storage
  - Integration with existing workflows
- Bring data closer to our users
  - New ways to interact with the data
- CERNBox/EOS is an innovative platform for scientific computing
  - great scalability and performance





www.cern.ch