

XROOTd for cloud storage

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Cloud Storage

- Remote storage popularized by commercial vendors like Dropbox or Google drive
 - Many commercial free storage; Dropbox, Google drive, MS Onedrive, Amazon Drive, etc...
 - Free for small size. Some of them offer unlimited space with small costs.
- They are used like backup of your laptop/desktop or archival storage of your pictures and videos.
 - Synchronize local contents with those at cloud storage
 - Think of it like “rsync”
- Open source alternatives for cloud storage.
 - Owncloud, Nextcloud, pydio, etc...
 - CERN box, etc...

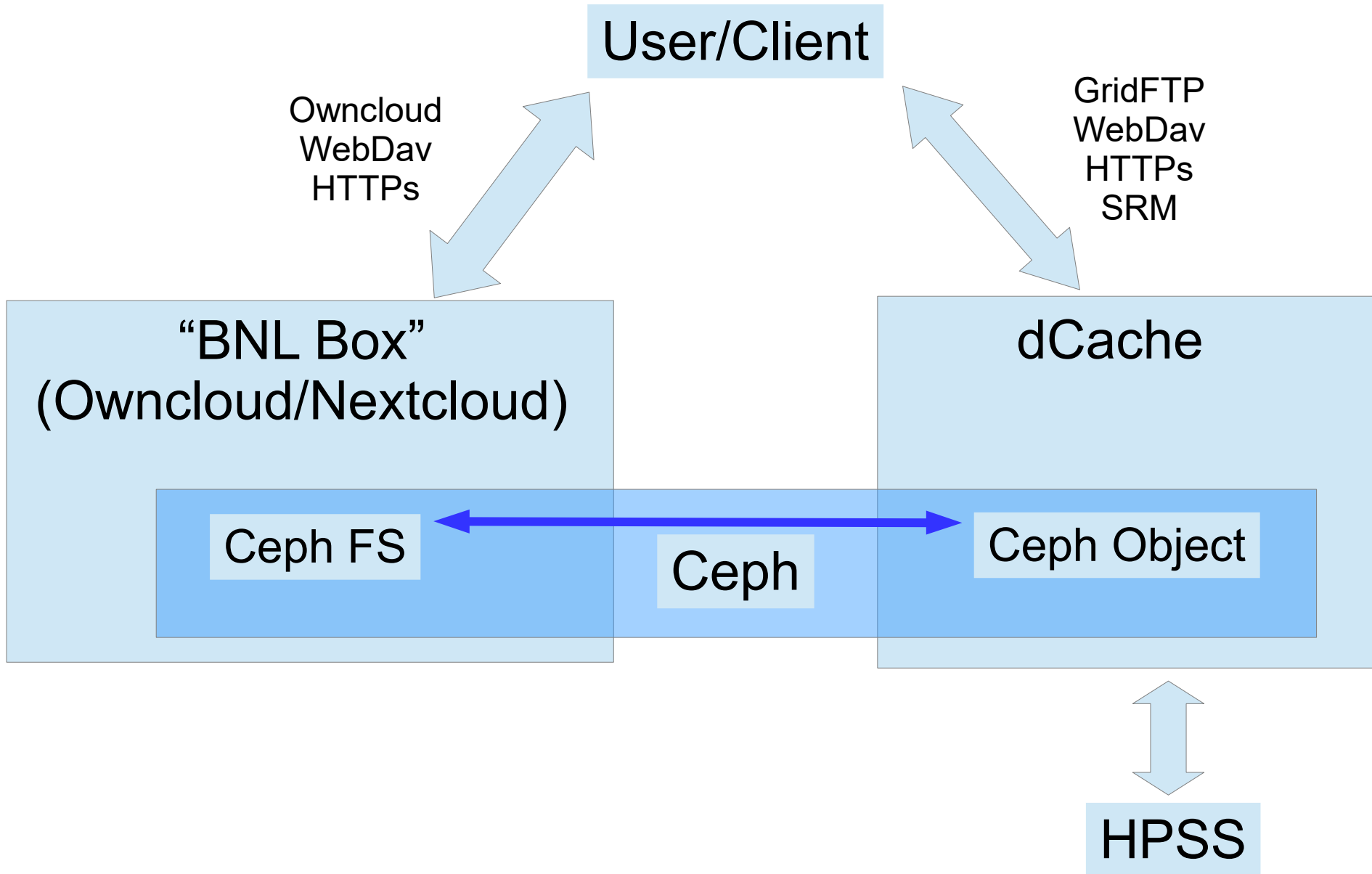
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Owncloud/Nextcloud

- Using the already existing, one-shot command to synchronize the contents of local machine to those of the cloud storage, one can achieve about 100MB/s.
 - The reason is that the client software limits the bandwidth.
 - The most of normal users don't have WAN network throughput of 100MB/s or even 10MB/s. Users normally don't want to use all available network bandwidth.
- Owncloud has WebDAV interface.
 - The custom client is easily possible.
 - Using the WebDAV, one can achieve much higher rate (>1GB/s)
 - Owncloud interface is made by PHP.
 - It uses 8KB block size for IO read/write. Problem???
- The cloud storage normally requires the same amount of storage in local storage and remote cloud storage.
 - 100GB in local machine = 100 GB in cloud storage
 - It is not usually used like central storage.

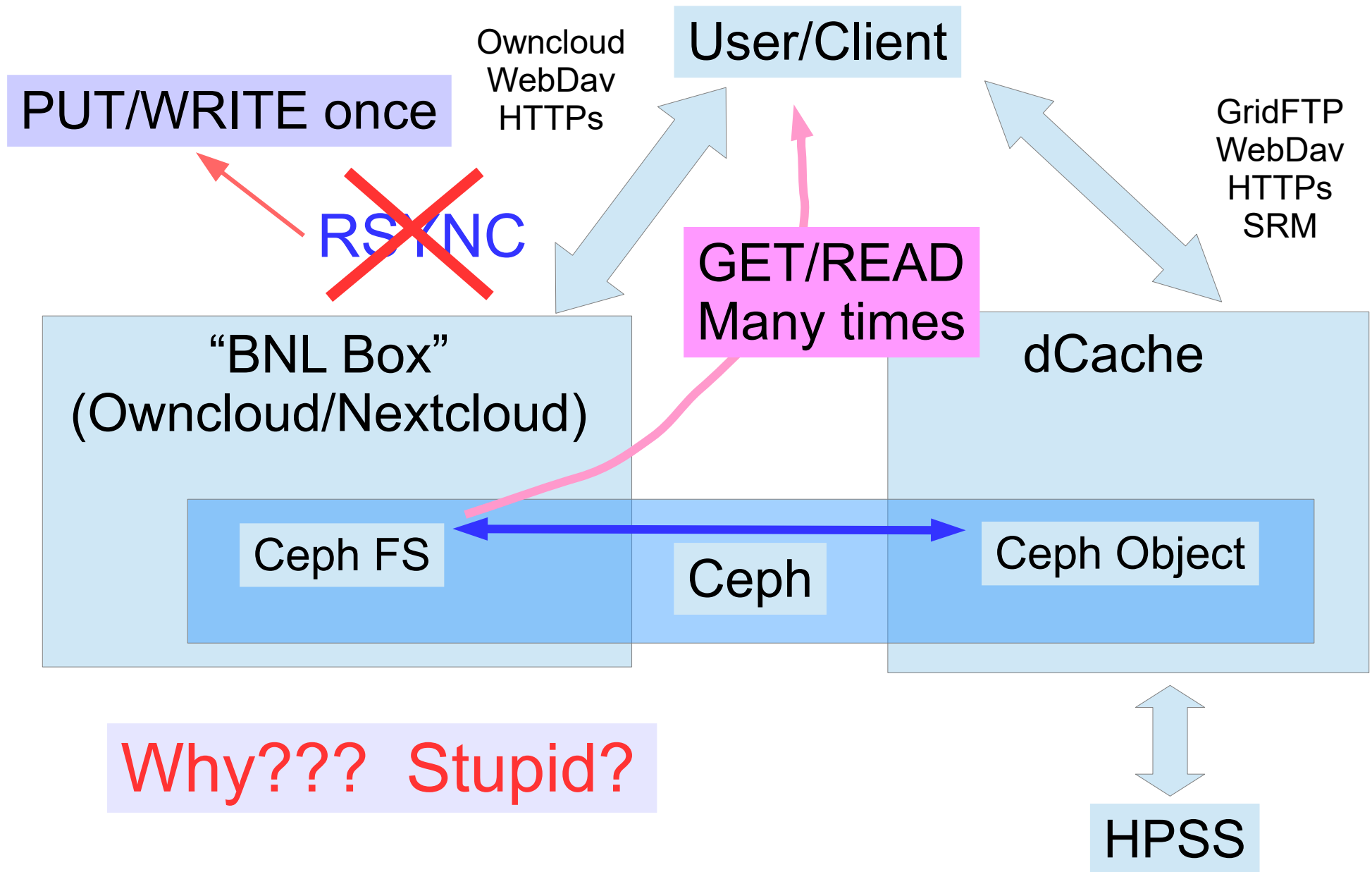
Proposed Scheme



Central Storage

- The cloud storage is great. But, I also want to use it as a central storage as well.
 - Reason
 - Data volume: The size of data won't fit in the local storage.
 - Still would like to use the easy-to-use Owncloud interface for the most of the operation.
 - Grid commands based on X509 are too complicated outside of HEP.
 - Data analysis: would like to use computing farms and not my local machine.

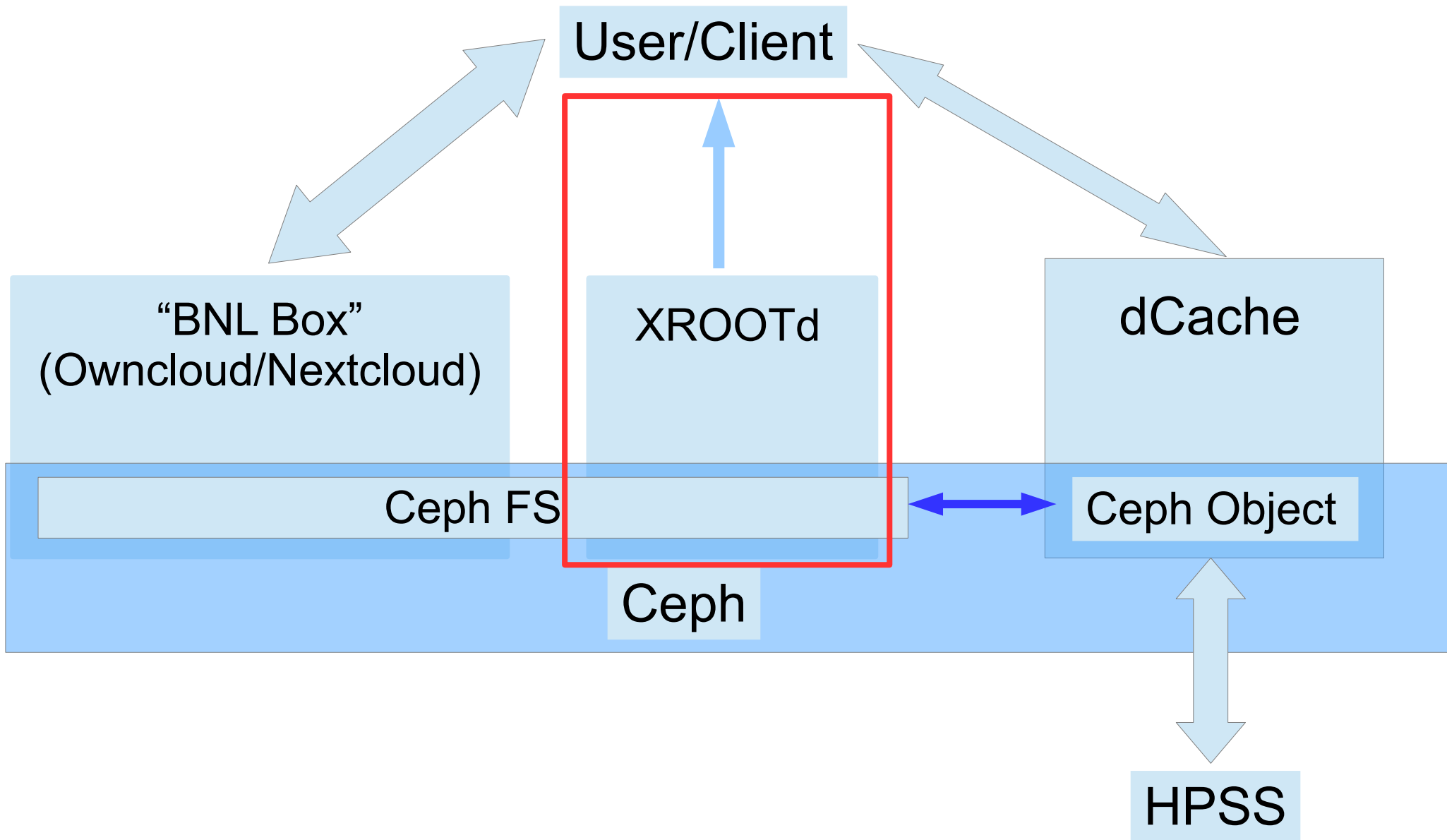
Use it like Central Storage



XROOTd as Read IO Service

- Owncloud/Nextcloud stores data with Apache owner.
 - XROOTd also usually run as “one” (xrootd) user.
- Owncloud/Nextcloud stores different user data in separate, isolated directories.
 - User A → /A/... while user B → /B/...
 - XROOTd's acc.authdb directive provides easy way to authorize a particular user to only his/her own data.
 - Can we not use **FLATFILE**
- Data is stored in Cephfs.
 - Multiple XROOTd services can be run on separate hosts to provide resilient read IO

Cloud storage as Central Storage



Sample Interfaces

The image displays two versions of the ownCloud interface: a desktop web interface and a mobile application interface.

Desktop Interface (Left):

- Header: ownCloud logo, user profile (hito, 192.12.15.173), and navigation tabs (Activity, General, Network).
- Status: Connected to <https://192.12.15.173> as hito. Storage usage: 296 GB of 500 GB in use.
- Sync Status: ownCloud is synchronizing with local folder ownCloud. Synced folders include Data (296 GB), Documents (65 KB), Photos (36 MB), and Tapes (12 MB).
- Navigation: Hironori Ito > ownCloud

Desktop Interface (Right):

- Header: Files, user profile (Hironori Ito)
- Navigation: All files, Favorites, Shared with you, Shared with others, Shared by link, Tags
- File List:

Name	Size	Modified
Data	296.3 GB	5 days ago
Documents	65 KB	25 days ago
Photos	35.8 MB	17 hours ago
Tapes	12.5 MB	18 days ago
ownCloud Manual.pdf	3.7 MB	a month ago

Mobile Interface (Bottom Right):

- Header: ownCloud
- File List:

Data	296.3 GB, 6 days ago
Documents	65 KB, Oct 15
Photos	35.8 MB, 2 days ago
Tapes	12.5 MB, Oct 22
ownCloud Manual.pdf	3.7 MB, Oct 14

Desktop File List (Bottom):

Name	Date modified	Type	Size
Documents	10/14/2016 5:15 PM	File folder	
Photos	11/8/2016 8:53 PM	File folder	
.csync_journal	11/8/2016 8:57 PM	Data Base File	72 KB
.csync_journal.db-shm	11/8/2016 8:57 PM	DB-SHM File	32 KB
.csync_journal.db-wal	11/8/2016 8:57 PM	DB-WAL File	0 KB
.owncloudsync	11/8/2016 8:57 PM	Text Document	37 KB
ownCloud Manual	10/13/2016 5:14 PM	Adobe Acrobat D...	3,822 KB