

# 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...

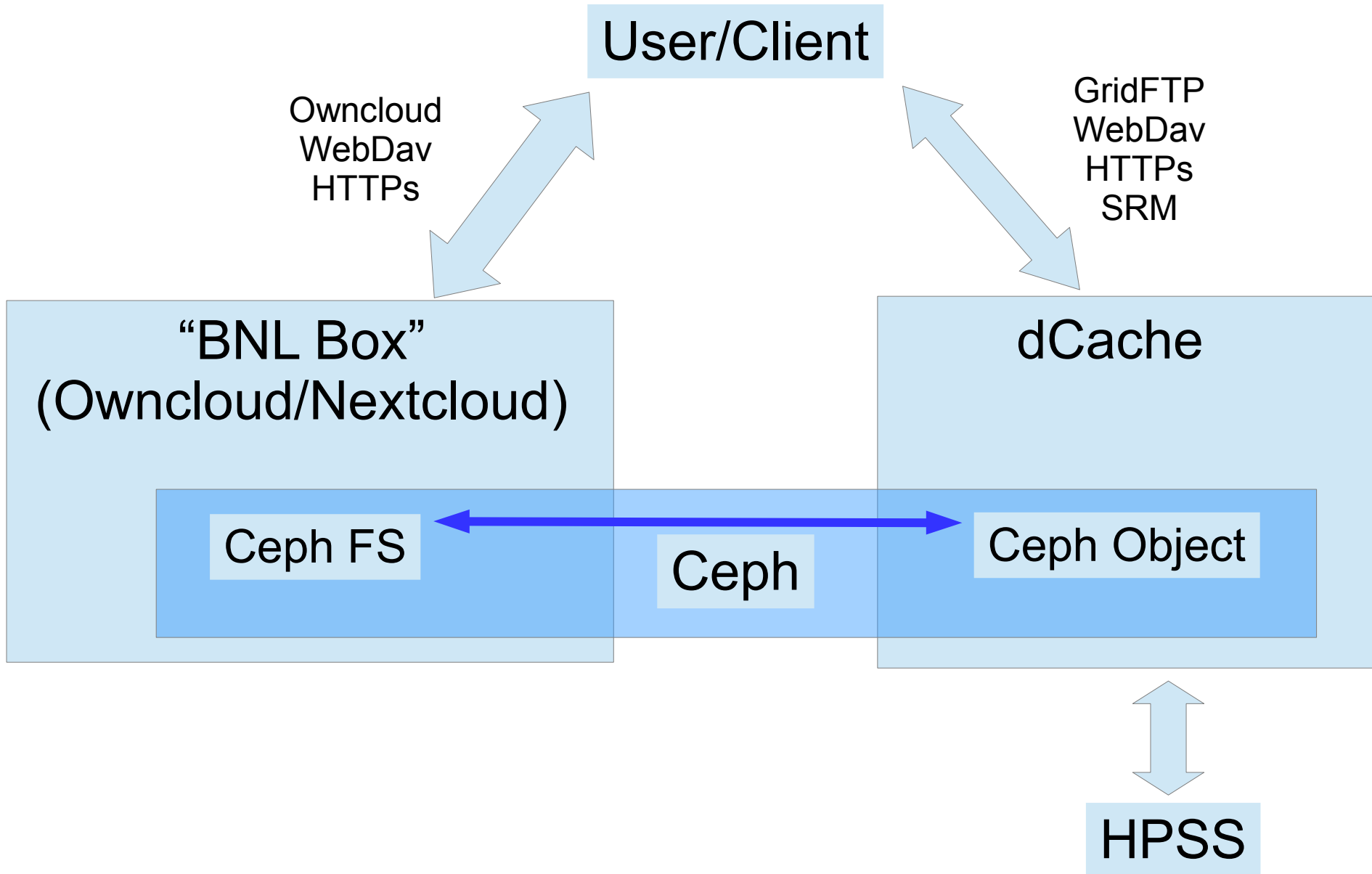
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# Owncloud/Nextcloud

- 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.

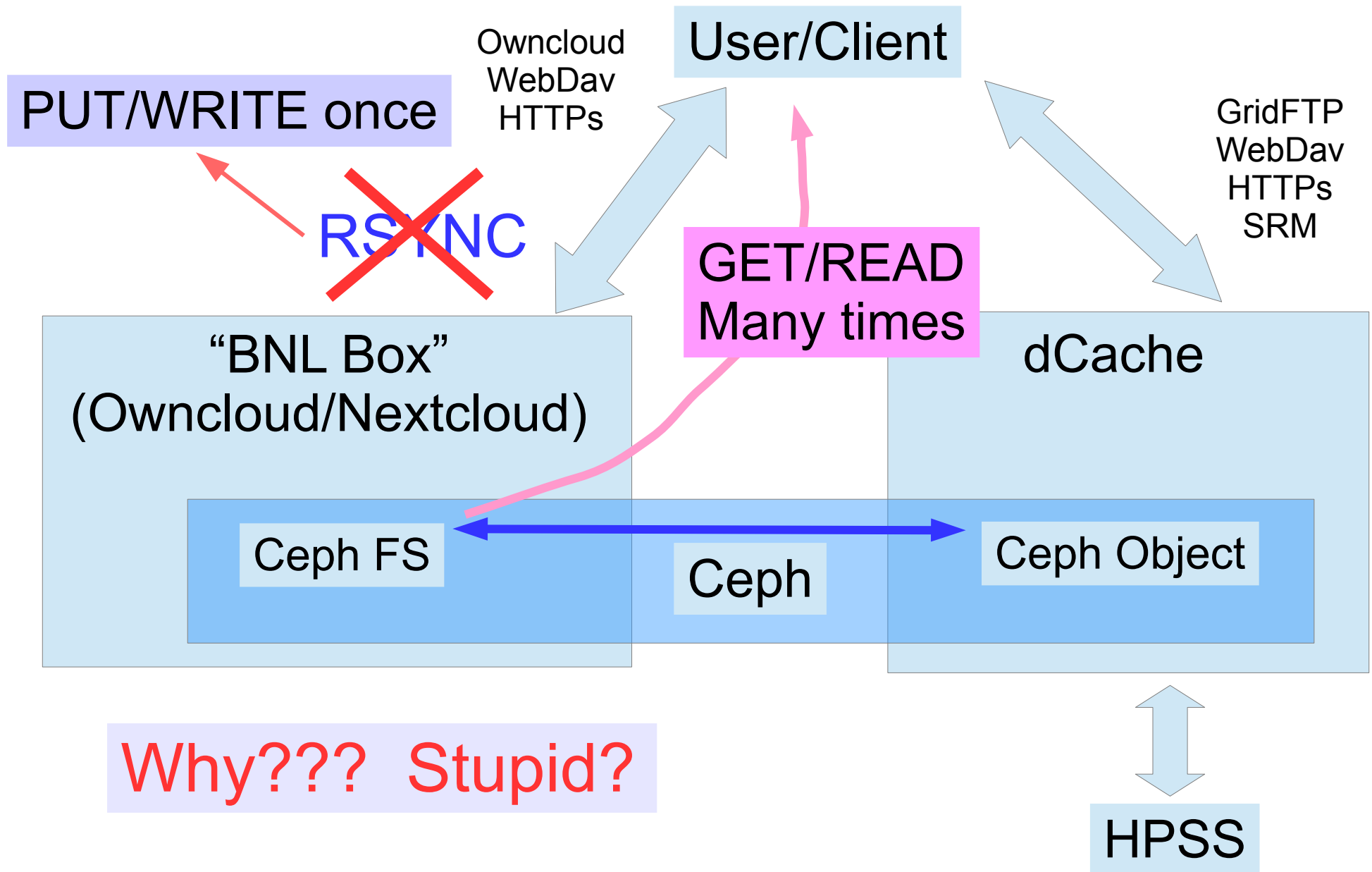
# Proposed Scheme



# 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

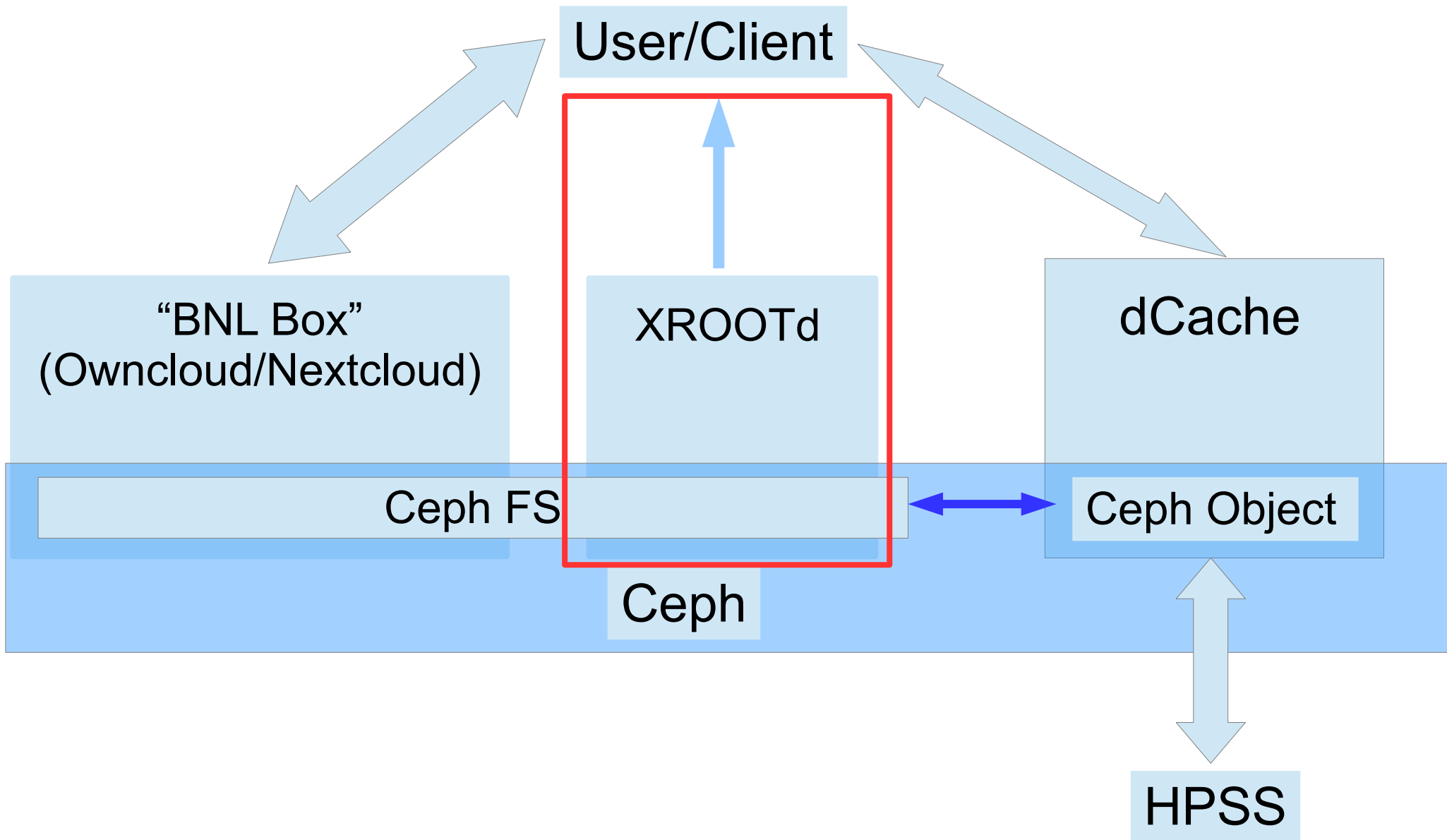


# XROOTd as Read IO Service

- 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 app interface.

**Desktop Web Interface:**

- Header: ownCloud, Files, Hironori Ito
- Navigation: All files, Favorites, Shared with you, Shared with others, Shared by link, Tags, Deleted files, Settings
- Content: List of folders and files with columns for Name, Size, and Modified. Includes folders like Data (296.3 GB), Documents (65 KB), Photos (35.8 MB), and Tapes (12.5 MB), and a file named ownCloud Manual.pdf (3.7 MB).

**Mobile App Interface:**

- Header: ownCloud
- Content: List of folders and files with columns for Name, Size, and Modified. Includes folders like Data (296.3 GB, 6 days ago), Documents (65 KB, Oct 15), Photos (35.8 MB, 2 days ago), and Tapes (12.5 MB, Oct 22), and a file named ownCloud Manual.pdf (3.7 MB, Oct 14).

**Desktop File Explorer:**

Path: Hironori Ito > ownCloud

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