



CNRS - DSI

**My CoRe - ownCloud at CNRS**



# Content

- 1** Background and context
- 2** Service summary
- 3** User feedback
- 4** Architecture
- 5** Next steps



# Content

**1** Background and context

2 Service summary

3 User feedback

4 Architecture

5 Next steps

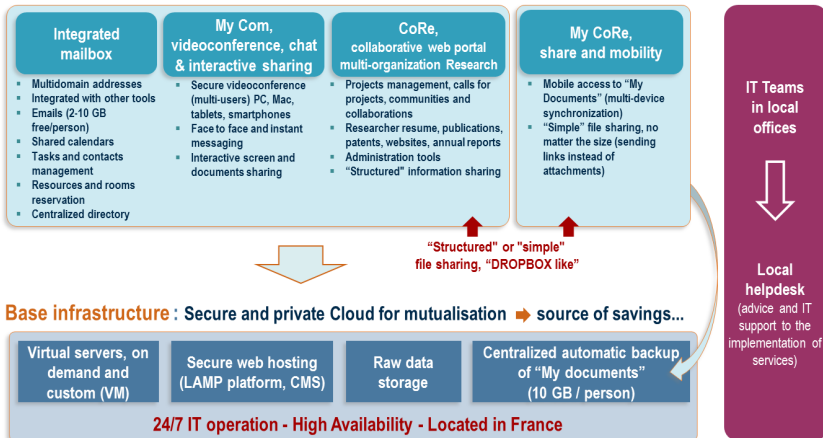
6 To go further

7 Annexes

# Background and context (1/3)

**Users “ecosystem”** : native integration of tools ➡ easy to use ...

**Helpdesk**



## Background and context (2/3)

### Business needs

- Synchronization and sharing service to provide a secure alternative to Dropbox for CNRS users
- Target (on the long term) = 100.000 end users with 10GB per user

### Solution

- ownCloud (community edition), because it has the required functionality and it is open source
- New technical infrastructure located under CNRS' IN2P3 Computing Center

## Background and context (3/3)

### Schedule and deployment steps

- January to August 2013 : market survey
- September 2013 to April 2014 : ownCloud technical evaluation (in collaboration with)
- May to June November 2014 : implementation and test
- ~~July to August 2014~~ December 2014 to January 2015 : beta service for end users, 2.000 users / 5 GB per user
- ~~From September 2014 to end 2015~~ From February 2015 to end 2015 : deployment to other CNRS laboratories



# Content

1 Background and context

2 Service summary

3 User feedback

4 Architecture

5 Next steps

6 To go further

7 Annexes

## Service summary (1/3)

<b>Status :</b>	Planned
<b>Number of users (target) :</b>	30.000
<b>Default and Maximum quota :</b>	10GB
<b>Linux/Mac/Win user ratio :</b>	(estimated)20/20/60
<b>Desktop clients-Mobile clients-Web access ratio :</b>	unknown yet
<b>Technology :</b>	ownCloud with Galera-MariaDB and Scality backend storage
<b>Target communities :</b>	CNRS members
<b>Integration in your current environment :</b>	None
<b>Risk factors :</b>	Load on DB
<b>Most important functionality :</b>	ownCloud core only with some custom apps (see below)
<b>Missing functionality :</b>	App to send large files via email (see below)





## Service summary (2/3)

### ownCloud community edition 7 with few apps

- ❑ ownCloud core = `https://github.com/owncloud/core;v7.0.2`
- ❑ Antivirus app = `http://apps.owncloud.com/CONTENT/content-files/157439-files\_antivirus.tar.gz`
- ❑ Activity app = `https://github.com/owncloud/activity;v7.0.2`
- ❑ Without Versions app

### And some apps developed by CNRS

- ☐ App for metrics on service usage = <https://github.com/ppaysant/dashboard>
- ☐ App for managing a lot of groups = <https://github.com/ppaysant/lotsofgroups>
- ☐ App for end users group management = [https://github.com/ppaysant/group\\_custom](https://github.com/ppaysant/group_custom)
- ☐ App for password policy enforcement = [https://github.com/ppaysant/password\\_policy](https://github.com/ppaysant/password_policy)
- ☐ App for GTU online agreement = <https://github.com/marcdexet-cnrs/gtu>
- ☐ App for filtering access depending on end user groups = <https://github.com/marcdexet-cnrs/gatekeeper>
- ☐ App for end users authenticate and account provisioning = [https://github.com/marcdexet-cnrs/user\\_servervars2](https://github.com/marcdexet-cnrs/user_servervars2)
- ☐ A specific theme = <https://github.com/CNRS-DSI-Dev/mycore>



# User feedback

1 Background and context

2 Service summary

**3 User feedback**

4 Architecture

5 Next steps

6 To go further

7 Annexes

# User feedback

## Service not yet deployed !

- ☐ But end users ask for such a service !
- ☐ They often use instead Dropbox like services



# Content

P. 13 / 34

1 Background and context

2 Service summary

3 User feedback

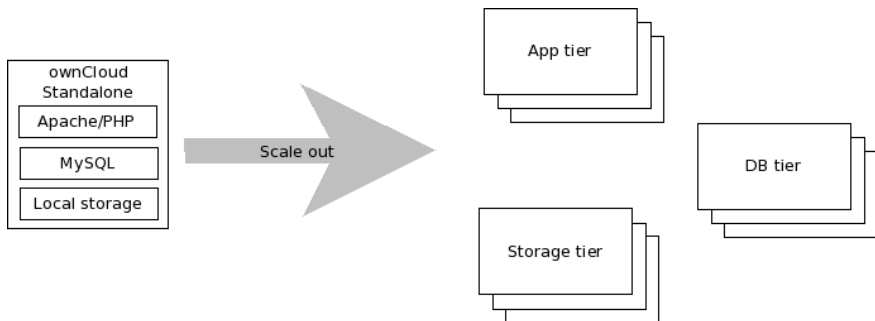
**4 Architecture**

5 Next steps

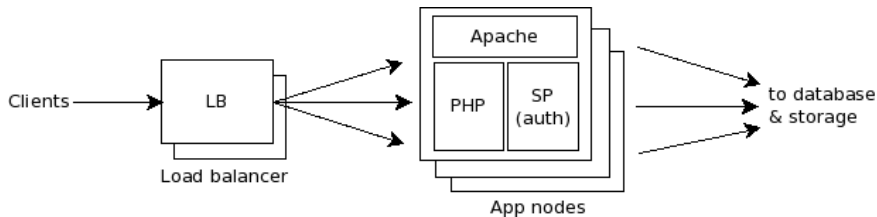
6 To go further

7 Annexes

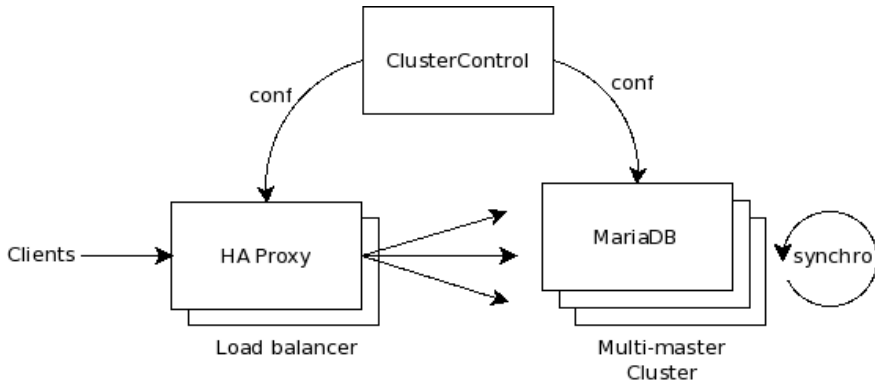
# Architecture overview



# App tier : ownCloud, PHP, Apache



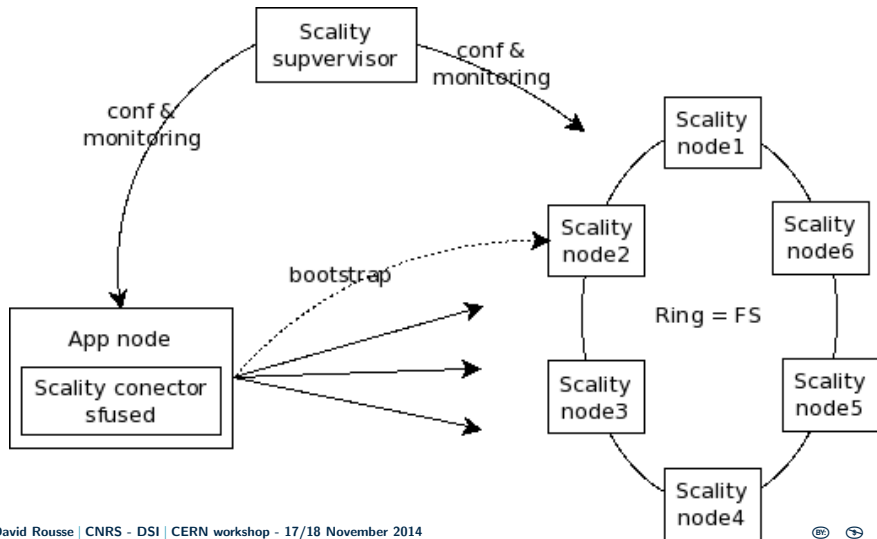
## DB tier : Galera/MariaDB cluster





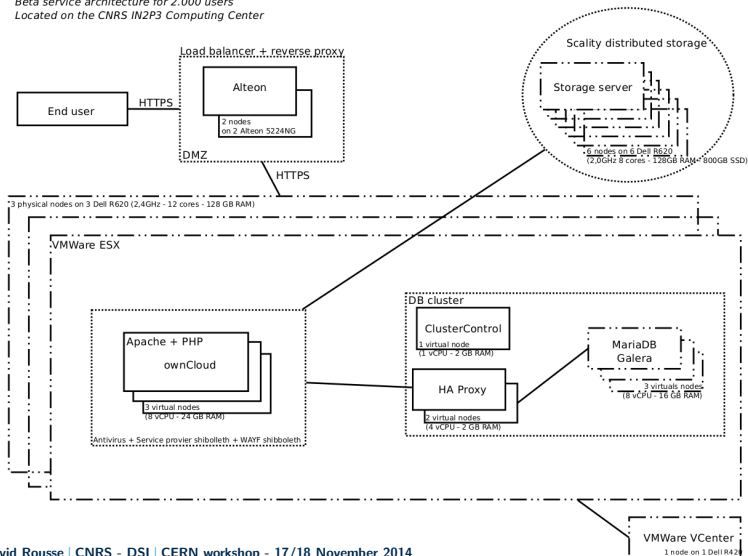
# Storage tier : Scality distributed storage

P. 17 / 34



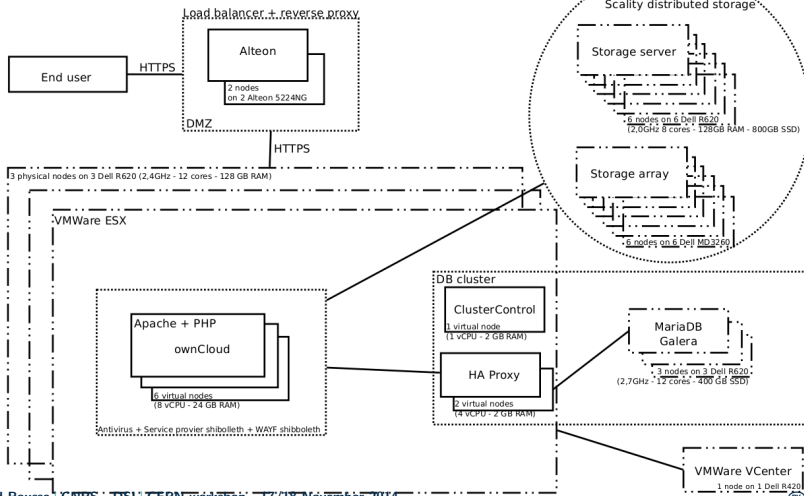
# Beta service architecture

P. 18 *Beta service architecture for 2.000 users  
Located on the CNRS IN2P3 Computing Center*



# Production service architecture

Production target architecture for 5,000-30,000 users (depending on service usage)  
Located on the CNRS IN2P3 Computing Center





# Content

P. 20 / 34

1 Background and context

2 Service summary

3 User feedback

4 Architecture

**5 Next steps**

6 To go further

7 Annexes

## Next steps

### Deploy the beta service for 2.000 CNRS users

- ☐ Get a real feedback from end users
- ☐ Check the way the architecture works live !

### Technical improvements

- ☐ Reducing the DB load
- ☐ Using object storage instead of sfused connector
- ☐ Deploying multiple instances of the service and use the "Server to server sharing" ownCloud function
- ☐ Improving the Versions apps



# Content

P. 22 / 34

1 Background and context

2 Service summary

3 User feedback

4 Architecture

5 Next steps

**6 To go further**

7 Annexes

## To go further

### Contacts at CNRS

- ☐ marc.dexet@dsi.cnrs.fr (developer)
- ☐ gilian.gambini@dsi.cnrs.fr (technical manager)
- ☐ eric.gervasoni@dr20.cnrs.fr (end users committee manager)
- ☐ paulo.moradefreitas@dr2.cnrs.fr (end users committee manager)
- ☐ david.rousse@dsi.cnrs.fr (project manager)
- ☐ patrick.paysant@linagora.com (developer)
- ☐ lyderic.saint-criq@cnrs-dir.fr (developer)



# Annexes' content

1 Background and context

2 Service summary

3 User feedback

4 Architecture

5 Next steps

6 To go further

**7 Annexes**



## Annex 1 : load test method (1/2)

### Functional hypothesis on the service usage

- ☐ Service accessible to all CNRS population : target 100.000 (end of 2015)
- ☐ 50% of population will actually use the service
- ☐ Quota per user : 10GB
- ☐ Average files per user : 1.000
- ☐ Average file size : 5MB
- ☐ File updates per day per user : 50
- ☐ Each file updated is replicated to 4 different devices :
  - ▶ Number of devices per user : 3
  - ▶ 15% of files are shared, to 5 other users

## Annex 1 : load test method (2/2)

### Estimate based on these hypothesis

- Hypothesis on Apache (8 cores, 16GB RAM) : 530 simultaneous requests
- Hypothesis on MariaDB (8 cores, 16GB RAM) :
  - ▶ SELECTs : max 3857 per sec
  - ▶ INSERTs : max 22000 per sec
  - ▶ UPDATEs : max 3857 per sec

### Load tests to check our estimate, under a simple architecture

- 2 reverse proxies (Apache with modproxy)
- 2 load balancing servers (Piranha)
- 2 ownCloud servers (Apache, ownCloud 6)
- 1 MariaDB server

## Annex 2 : DB load estimate

Required MariaDB servers, based on theoretical approach

SQL servers	Number of SQL nodes (~ VM) for the estimated SQL load (8 cores/16GB RAM per node)						
	Number of users (N)						
% of active users	1	1000	5000	30000	50000	70000	100000
5,00%	1	1	1	3	5	7	10
10,00%	1	1	1	6	9	12	18
15,00%	1	1	2	8	13	18	25
20,00%	1	1	2	11	18	24	35
30,00%	1	1	3	16	27	38	54
50,00%	1	1	3	18	30	41	59

## Annex 2 : Web load estimate

Required Apache servers, based on theoretical approach

Web servers	Number of web nodes for the estimated load (8 cores/16GB RAM per node)						
	Number of users (N)						
% of active users	1	1000	5000	30000	50000	70000	100000
5,00%	1 serv	1 serv	1 serv	3 serv	5 serv	7 serv	10 serv
10,00%	1 serv	1 serv	1 serv	6 serv	10 serv	14 serv	19 serv
15,00%	1 serv	1 serv	2 serv	9 serv	15 serv	20 serv	29 serv
20,00%	1 serv	1 serv	2 serv	12 serv	19 serv	27 serv	38 serv
30,00%	1 serv	1 serv	3 serv	17 serv	29 serv	40 serv	57 serv
50,00%	1 serv	1 serv	5 serv	29 serv	48 serv	67 serv	95 serv

## Annex 2 : network bandwidth load estimate

P. 29 / 34

Network bandwidth load estimate, based on theoretical approach

<b>Total DL</b>		<i>Network bandwidth simulation for download [Sync own+Sync share] (global ownCoRe architecture)</i>						
		Number of users (N)						
% of active users		1	1000	5000	30000	50000	70000	100000
5,00%	0 mb/s	13 mb/s	64 mb/s	382 mb/s	637 mb/s	891 mb/s	1 273 mb/s	1 273 mb/s
10,00%	0 mb/s	25 mb/s	127 mb/s	764 mb/s	1 273 mb/s	1 782 mb/s	2 546 mb/s	2 546 mb/s
15,00%	0 mb/s	38 mb/s	191 mb/s	1 146 mb/s	1 910 mb/s	2 674 mb/s	3 819 mb/s	3 819 mb/s
20,00%	0 mb/s	51 mb/s	255 mb/s	1 528 mb/s	2 546 mb/s	3 565 mb/s	5 093 mb/s	5 093 mb/s
30,00%	0 mb/s	76 mb/s	382 mb/s	2 292 mb/s	3 819 mb/s	5 347 mb/s	7 639 mb/s	7 639 mb/s
50,00%	0 mb/s	127 mb/s	637 mb/s	3 819 mb/s	6 366 mb/s	8 912 mb/s	12 731 mb/s	12 731 mb/s

<b>Total UL</b>		<i>Network bandwidth simulation for upload [Sync own+Sync share] (global ownCoRe architecture)</i>						
		Number of users (N)						
% of active users		1	1000	5000	30000	50000	70000	100000
5,00%	0 mb/s	5 mb/s	23 mb/s	139 mb/s	231 mb/s	324 mb/s	463 mb/s	463 mb/s
10,00%	0 mb/s	9 mb/s	46 mb/s	278 mb/s	463 mb/s	648 mb/s	926 mb/s	926 mb/s
15,00%	0 mb/s	14 mb/s	69 mb/s	417 mb/s	694 mb/s	972 mb/s	1 389 mb/s	1 389 mb/s
20,00%	0 mb/s	19 mb/s	93 mb/s	556 mb/s	926 mb/s	1 296 mb/s	1 852 mb/s	1 852 mb/s
30,00%	0 mb/s	28 mb/s	139 mb/s	833 mb/s	1 389 mb/s	1 944 mb/s	2 778 mb/s	2 778 mb/s
50,00%	0 mb/s	46 mb/s	231 mb/s	1 389 mb/s	2 315 mb/s	3 241 mb/s	4 630 mb/s	4 630 mb/s

## Annex 3 : why Scality ? (1/4)

### Software-defined storage leader

- ☐ Objects storage
- ☐ Scale-out storage
- ☐ Mutualized storage
- ☐ Data protection with ARC technology

### What we like

- ☐ Compatible with all x86 server
- ☐ Best ration between raw data/util data
- ☐ Easy to install and administrate
- ☐ Naturally high available
- ☐ No RAID needed



## Annex 3 : why Scality ? (2/4)

P. 31 / 34



SCALITY

Supervisor  
Administration

Logged in as root

Hardware | Logout

Local > owncore

Dashboard | Operation | Administration | Provisioning

### Status

State RUN  
Autojoin Off  
Online **12** Nodes  
0 RS2  
Connectors  
Alerts 0

### Storage capacity

# Objects  
# Unique objects 1  
Average size 0.00 KB  
Avg size (unique) 0.00 KB  
  
Unique 0.00 % 0 GB  
Stored 0.00 % 0 GB  
Used 1.84 % 0 GB  
Available 98.16 % 20.00 GB  
Total 21.00 GB

Welcome to the provisioning wizard, step one: choose the servers you want to configure.

	Server	Zone	State	# nodes
<input checked="" type="checkbox"/>	192.168.55.21		RUN	<b>6</b>
<input checked="" type="checkbox"/>	192.168.55.22		RUN	<b>6</b>

Warning! We recommend having at least 6 servers.

Configure

[\[Manual provisioning\]](#)



P. 32 / 34

## Annex 3 : why Scality ? (3/4)



Administration Interface

Log out

Welcome, Joe Madureira

Supervisor > Local > Anaconda

Dashboard Administration Preferences

Nodes Connectors Actions

### Status Anaconda

Nodes: 24  
Connectors: 12  
Alerts: 3  
Tasks: 9

Nodes

Objects: 65,134,803  
Unique objects: 21,728,249  
Average size: 23.61 KB  
Avg size (unique): 171.00 KB

Unique: 8.43 TB 44.18 %  
Stored: 8.43 TB 18.24 %  
Used: 8.43 TB 27.26 %  
Available: 8.43 TB 72.74 %  
Total: 8.43 TB

### Nodes

All by tasks by keys

nodea.ring2.devsca.com

Name	Key	Tasks	Objects	CPU	State	Action
nodea_r2_01	CE38E3	0	1809651	2%	RUN	<a href="#">Leave</a>
nodea_r2_02	8E38E3	0	1806412	2%	RUN	<a href="#">Leave</a>
nodea_r2_01	CE38E3	0	1809651	2%	RUN	<a href="#">Leave</a>
nodea_r2_02	8E38E3	0	1806412	2%	RUN	<a href="#">Leave</a>
nodea_r2_01	CE38E3	0	1809651	2%	RUN	<a href="#">Leave</a>
nodea_r2_02	8E38E3	0	1806412	2%	RUN	<a href="#">Leave</a>

Disk Name	Stored	Used	Avail	Total (TB)	Stored/Used
disk1(OK)	0.07	0.10	0.65	0.74	
disk1(OK)	0.07	0.10	0.65	0.74	

nodeb.ring2.devsca.com

Name	Key	Tasks	Objects	CPU	State	Action
nodea_r2_01	CE38E3	0	1809651	2%	RUN	<a href="#">Leave</a>
nodea_r2_01	CE38E3	0	1809651	2%	RUN	<a href="#">Leave</a>

4.1.1 (codename Isildur ; build r33425) Ring by Scality Copyright 2007-2013 © Scality - All rights reserved



# Annex 3 : why Scality ? (4/4)

P. 33



## Annex 4 : some links

### URLs in relation with My CoRe

- Load test in detail =  
[https://github.com/CNRS-DSI-Dev/mycore\\_press/blob/master/CERN-CNRS-meeting-20140513.pdf](https://github.com/CNRS-DSI-Dev/mycore_press/blob/master/CERN-CNRS-meeting-20140513.pdf)
- JoSy conference (in French), Strasbourg 2014 May =  
[https://github.com/CNRS-DSI-Dev/mycore\\_press/blob/master/Point\\_JoSy\\_19052014.pdf](https://github.com/CNRS-DSI-Dev/mycore_press/blob/master/Point_JoSy_19052014.pdf)
- Scalcity in detail, made for the CNES (in French) =  
[https://github.com/CNRS-DSI-Dev/mycore\\_press/blob/master/owncore\\_scalcity-cnes.pdf](https://github.com/CNRS-DSI-Dev/mycore_press/blob/master/owncore_scalcity-cnes.pdf)
- Other resources to come =  
[https://github.com/CNRS-DSI-Dev/mycore\\_press](https://github.com/CNRS-DSI-Dev/mycore_press)