



CNRS - DSI

My CoRe - ownCloud at CNRS



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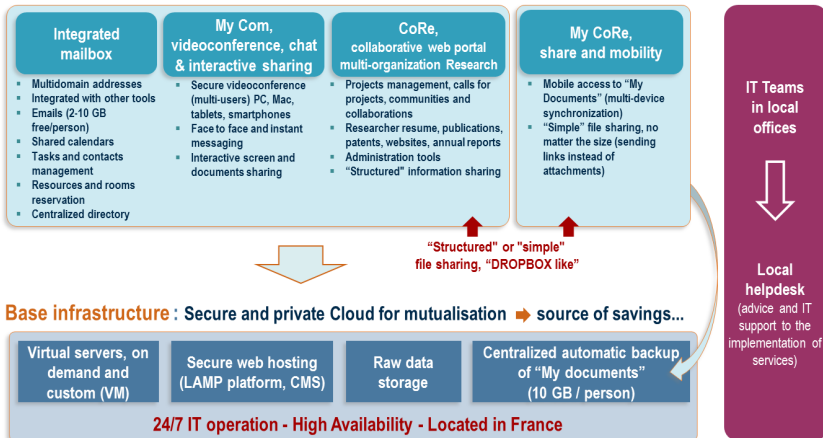
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Background and context (1/3)

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 Linagora)
- 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



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Service summary (1/3)

Status :	Planned
Number of users (target) :	30.000 for end 2015 (100.000 (?) on the long term)
Default and Maximum quota :	10GB
Linux/Mac/Win user ratio :	(estimated) 20/20/60
Desktop/mobile/web clients access ratio :	Unknown yet
Technology :	ownCloud with Galera-MariaDB and Scality backend storage
Target communities :	CNRS members
Integration in current environment :	None (except our existing Shibboleth SSO backend)
Risk factors :	Load on DB
Most important functionality :	ownCloud core with custom apps (see below)
Missing functionality :	Share via email files temporary and then delete the shared files (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



Service summary (3/3)

P. 1 And some apps developed/forked 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
- ☐ App for password policy enforcement = 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
- ☐ A specific theme = <https://github.com/CNRS-DSI-Dev/mycore>



User feedback

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User feedback

Service not deployed yet !

- ☐ But end users ask for such a service !
- ☐ Some local implementations of ownCloud exist at CNRS (for a single laboratory typically)
- ☐ Users often use Dropbox, Google Drive, ... for business, when no solution is provided internally



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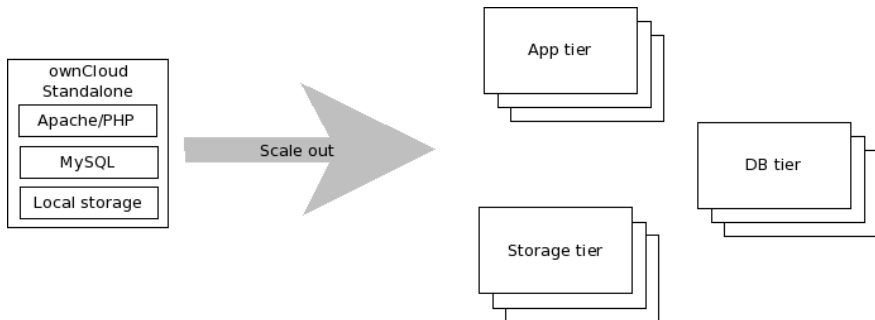
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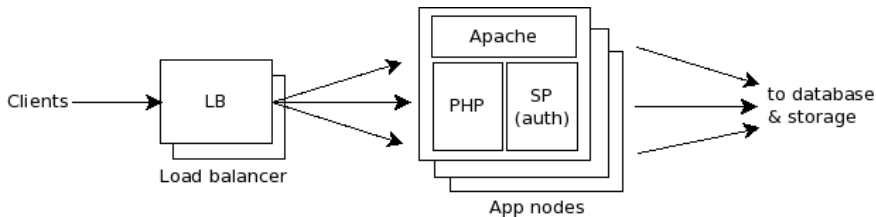
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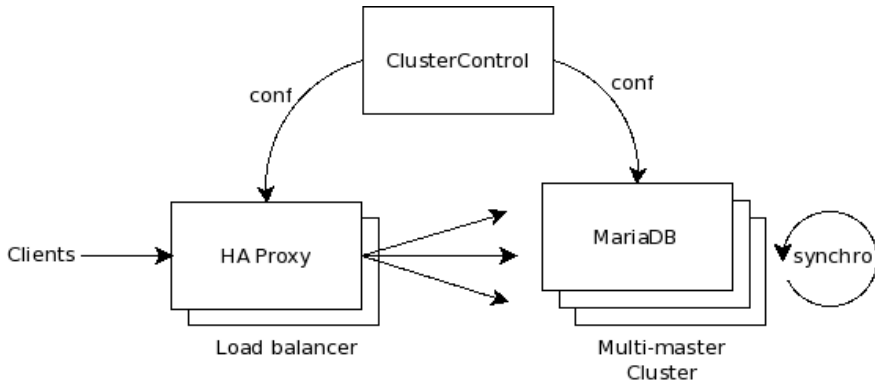
Architecture overview



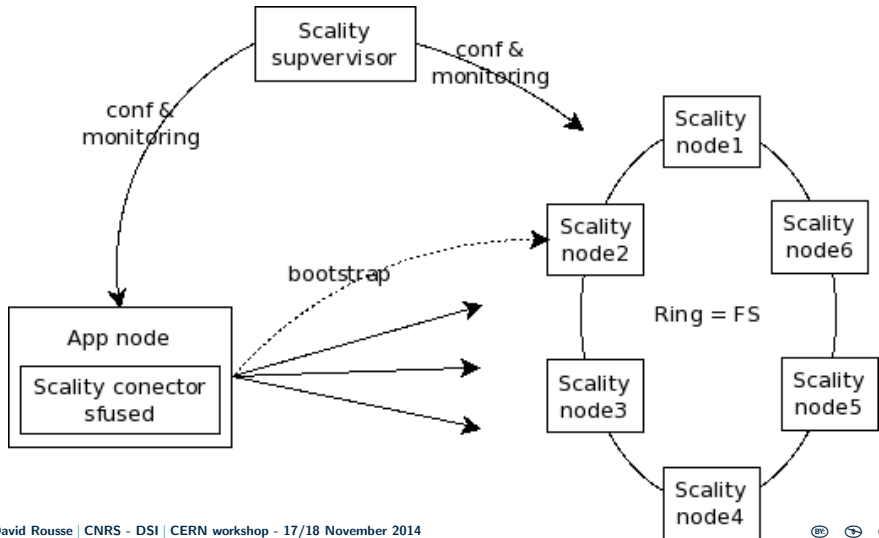
App tier : ownCloud, PHP, SP, Apache



DB tier : Galera/MariaDB cluster

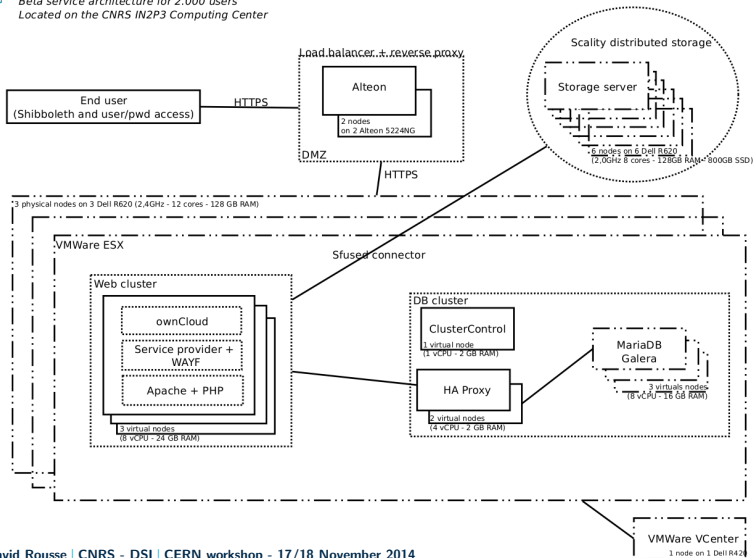


Storage tier : Scality distributed storage



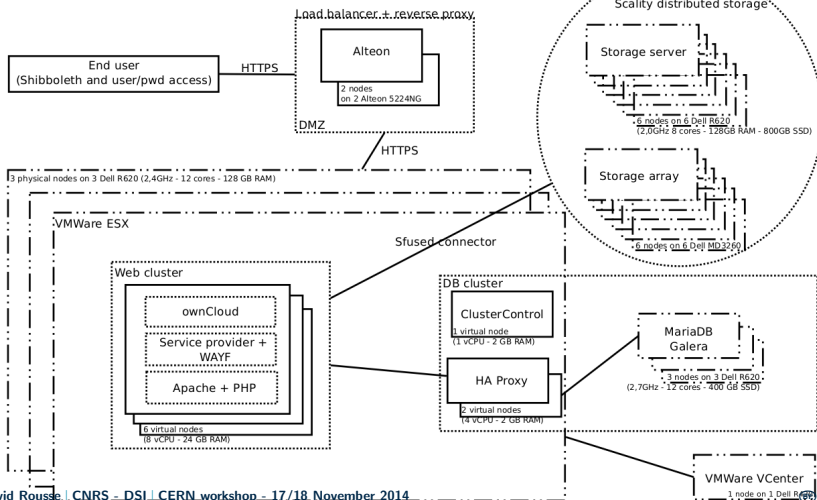
Beta service architecture

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





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Next steps

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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 (if needed !)
- ☐ Automatizing end users tests (if possible with <https://github.com/cernbox/smashbox>)
- ☐ Improving the Versions, Activity and Antivirus apps, if needed !
- ☐ Developing an app to share via email files temporary and then delete the shared files

Questions ?



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Annexes' content

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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

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Network bandwidth load estimate, based on theoretical approach

Total DL		<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

Total UL		<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 solution

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

What we like

- ☐ Compatible with all x86 servers
- ☐ Best ratio between raw data/util data
- ☐ Easy to install and administrate
- ☐ High available, by design
- ☐ Hardware RAID disabled



Annex 3 : why Scalify ? (2/4)

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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	6
<input checked="" type="checkbox"/>	192.168.55.22		RUN	6

Warning! We recommend having at least 6 servers.

Configure

[\[Manual provisioning\]](#)



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Annex 3 : why Scalify ? (3/4)



Administration Interface

Log out

Welcome, Joe Madureira

Supervisor > Local > Anaconda

Dashboard Administration Preferences

Nodes Connectors Actions

Status
Anaconda

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	Leave
nodea_r2_02	BE38E3	0	1806412	2%	RUN	Leave
nodea_r2_01	CE38E3	0	1809651	2%	RUN	Leave
nodea_r2_02	BE38E3	0	1806412	2%	RUN	Leave
nodea_r2_01	CE38E3	0	1809651	2%	RUN	Leave
nodea_r2_02	BE38E3	0	1806412	2%	RUN	Leave

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	Leave
nodea_r2_01	CE38E3	0	1809651	2%	RUN	Leave

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

Annex 3 : why Scality ? (4/4)

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Annex 4 : some links

URLs in relation with My CoRe

- ownCloud load test in detail =
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/CNRS-JoSy-20140519.pdf
- Scalcity in detail, press made for the CNES (in French) =
https://github.com/CNRS-DSI-Dev/mycore_press/blob/master/CNES-CNRS-Scalcity-20140619.pdf
- My CoRe, how is it build ? =
https://github.com/CNRS-DSI-Dev/mycore_build
- Other resources to come =
https://github.com/CNRS-DSI-Dev/mycore_press