

DSI - CNRS

My CoRe - ownCloud at CNRS



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- Background and context
- 2 Service summary
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Background and context (1/2)

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 10 Gb 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 (2/2)

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 2015From February 2015 to end 2015 : deployment to other CNRS units



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Service summary (1/3)

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

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
- 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 authentificate and account provisionning = https://github.com/marcdexet-cnrs/user_servervars2







User feedback

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User feedback

Service not yet deployed!

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

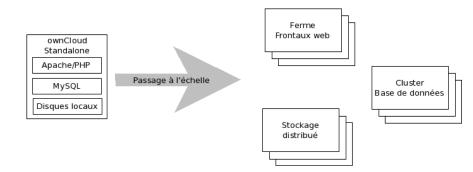


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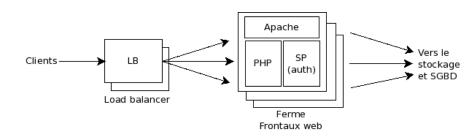


Architecture overview



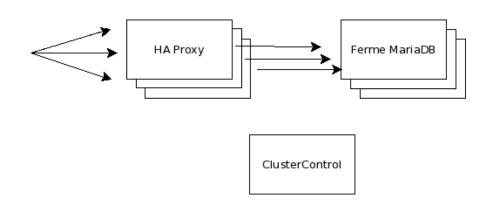


App tier: ownCloud, PHP, Apache





DB tier : Galera/MariaDB cluster





Storage tier: Scality distributed storage

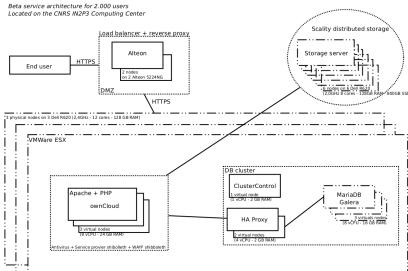
Scality node1 Scality Scality node1 node1 Noeud Web Scality Ring = FSsupvervisor Scality conector sfused Scality Scality node1 node1 Scality node1





Beta service architecture

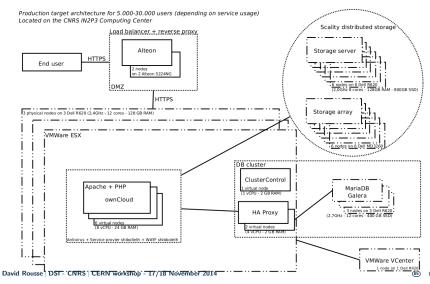
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Production service architecture

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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 improvments

- Reducing le DB load
- Use object storage instead of sfused connector
- Deploy multiple instances of the service and use the "Server to server sharing" ownCloud function



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To go further

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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
- \square 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 SQ	L nodes (~ VM)) for the estima	ated SQL load (8	8 cores/16GB RAN	1 per node)
	Number of use	ers (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		8	13	18	25
20,00%	1	1	2	11	18	24	35
30,00%	1	1		16	27	38	54
50,00%	1	1		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	1 (8 cores/16GB	RAM per node)	
	Number of use	rs (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





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Network bandwidth load estimate, based on theoretical approach

Total DL	Network band	with simulation	n for download i	Sync own+Sync	c share] (global d	ownCoRe archit	ecture)
	Number of us						
% 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
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
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
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
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
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
50,00% Total UL	Network band	with simulation			6 366 mb/s hare] (global own		
		with simulation					
Total UL	Network band Number of us	with simulation	n for upload [Sy	rnc own+Sync s	hare] (global owr	nCoRe architect	ure)
Total UL % of active users	Network band Number of us 1 0 mb/s	with simulation ers (N) 1000	n for upload [Sy	nc own+Sync s	hare] (global owr	nCoRe architect	ure) 100000
Total UL % of active users 5,00%	Network band Number of use 1 0 mb/s 0 mb/s	with simulation ers (N) 1000 5 mb/s	n for upload [Sy 5000 23 mb/s	own+Sync s 30000 139 mb/s	hare] (global own 50000 231 mb/s	nCoRe architect 70000 324 mb/s	ure) 100000 463 mb/s
Total UL % of active users	Network band Number of use 1 0 mb/s 0 mb/s 0 mb/s	with simulation ers (N) 1000 5 mb/s 9 mb/s	n for upload [Sy 5000 23 mb/s 46 mb/s	30000 30000 139 mb/s 278 mb/s	50000 231 mb/s 463 mb/s	70000 324 mb/s 648 mb/s	100000 463 mb/s 926 mb/s
Total UL % of active users 5,00% 10,00% 15,00%	Network band Number of us 1 0 mb/s 0 mb/s 0 mb/s 0 mb/s	ers (N) 1000 5 mb/s 9 mb/s 14 mb/s	5000 23 mb/s 46 mb/s 69 mb/s	30000 30000 139 mb/s 278 mb/s 417 mb/s	50000 50000 231 mb/s 463 mb/s 694 mb/s	70000 324 mb/s 648 mb/s 972 mb/s	100000 463 mb/s 926 mb/s 1 389 mb/s



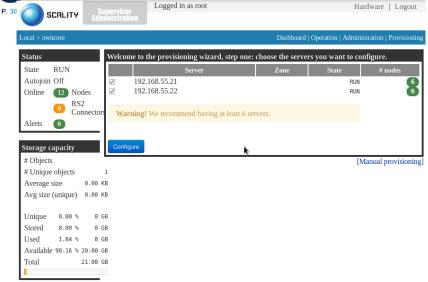
Software-defined storage leader

- 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









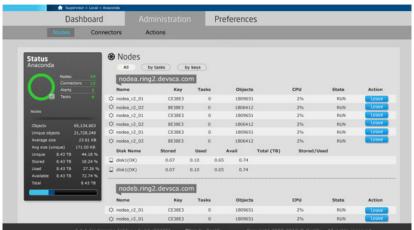
David Rousse | DSI - CNRS | CERN workshop - 17/18 November 2014





Administration Interface











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
- JoSy conference (in French), Strasbourg 2014 May =
 https://github.com/CNRS-DSI-Dev/mycore_press/blob/
 master/Point_JoSy_19052014.pdf
- Scality in detail, made for the CNES (in French) =
 https://github.com/CNRS-DSI-Dev/mycore_press/blob/
 master/owncore_scality-cnes.pdf
- Other resources to come =
 https://github.com/CNRS-DSI-Dev/mycore_press