



SEVENTH FRAMEWORK PROGRAMME

CloudSpaces

(FP7-ICT-2011-8)

Open Service Platform for the Next Generation of Personal Clouds

D6.3 Community involvement, exploitation, and dissemination report

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Table of Contents

| | | |
|----------|--|----------|
| 1 | Executive summary | 1 |
| 2 | Second year dissemination activities | 2 |
| 2.1 | Academic conferences and publications | 2 |
| 2.2 | Mass Media and Digital Media | 3 |
| 2.3 | Other Dissemination events | 4 |
| 3 | External collaborations | 6 |
| 3.1 | Collaboration with other research projects | 6 |
| 3.2 | Collaboration with other industries | 6 |
| 4 | Community involvement activities | 6 |

1 Executive summary

Since research is meant to make an impact in the society, the Cloudspaces project aims to disseminate its results to the community and spread the word about its novelty improvements in personal clouds.

As the project involves both industrial and research partners, the impact of this communication could reach actors in both industry and academia. It means that dissemination actions should focus on their targets to get their attention, so we could assure a better broadcasting of the results. We will extend this point in the following sections.

Apart from the communication plan, we will summarize all the dissemination activities done by each partner. During this second year, we continued our dissemination activities during the development of our project results. Thus, we focused on the advances made with respect to the previous year to highlight the progress of our project's result.

As with the dissemination report from the first year, we divided these activities into: academic conferences and publications, mass media impacts and other dissemination events. Finally, we included in this document all the external collaborations (both in academia and industry) and the community involvement activities that we started during this year.

2 Second year dissemination activities

In this section we will summarize the first year dissemination activities of each partner. We divided them into the following subsections:

2.1 Academic conferences and publications

URV publications and participations in academic conferences and papers accepted on research journals and magazines:

- Research publication (To appear). “StackSync: Bringing Elasticity to DropBox-like File Synchronization” P. García-López, S. Toda-Flores, C. Cotes-González, M. Sánchez-Artigas and J. Lenton. ACM/IFIP/USENIX Middleware’14 [7].
- Research publication (September 2014 - London, UK). “Reducing Costs in the Personal Cloud: Is Bittorrent a Better Bet?”. R. Chaabouni, M. Sánchez-Artigas and P. García-López. IEEE P2P’14 [3].
- Research publication (IEEE Internet Computing). “Smart Cloud Seeding for BitTorrent in Datacenters”. X. Leon, R. Chaabouni, M. Sánchez-Artigas and P. García-López. IEEE Internet Computing, Vol. 18. 2014, pp. 47–54 [11].
- Research publication (Future Generation Computer Systems). “Giving form to Social Cloud Storage through Experimentation: Issues and Insights”. R. Gracia-Tinedo, M. Sánchez-Artigas, A. Ramirez-Baena, A. Moreno-Martínez, X. Leon and P. García-López. Future Generation Computer Systems, Vol. 40. 2014, pp. 1–16 [9].
- Research publication (June 2014 - Haifa, Israel). “eWave: Leveraging Energy-Awareness for In-line Deduplication Clusters”. R. Gracia-Tinedo, M. Sánchez-Artigas and P. García-López. 7th ACM International Systems and Storage Conference (SYSTOR ’14). 2014. pp. 1-11 [8].
- Research publication (IEEE Transaction on Parallel and Distributed Systems). “Activity Stereotypes, or How to Cope with Disconnection during Trust Bootstrapping”. M. Sánchez-Artigas and B. Herrera. IEEE Transactions on Parallel and Distributed Systems (TPDS). 2014 [18].
- Research publication (IEEE Communications Magazine). “Towards efficient data access privacy in the cloud”. M. Sánchez-Artigas. IEEE Communications Magazine, Vol. 11, November 2013, pp. 39–45 [17].

EPFL publications and participations in academic conferences:

- Research publication (July 2014 - Amsterdam, The Netherlands). “C3P: Context-Aware Crowdsourced Cloud Privacy”. H. Harkous, R. Rahman and K. Aberer. Privacy Enhancing Technologies Symposium (PETS) 2014 [10].

- Research publication (September 2014 - London, UK). "Decentralizing the Cloud: How Can Small Datacenters Cooperate?". H. Zhuang, R. Rahman and K. Aberer. IEEE P2P'14 [19].
- Research publication (To Appear). "Cloud Storage Service Benchmarking: Methodologies and Experimentations". E. Bocchi, M. Mellia, and S. Sarni. IEEE CloudNet 2014 [1].

Eurecom publications and participations in academic conferences:

- Research publication (To appear). "Hybris: Efficient and Robust Hybrid Cloud Storage." D. Dobre, P. Viotti and M. Vukolić. 5th annual ACM Symposium on Cloud Computing (SoCC 2014) [6].
- Research publication (To appear). "Separating Data and Control: Asynchronous BFT Storage with $2t+1$ Data Replicas." C. Cachin, D. Dobre and M. Vukolić. 16th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2014) [2].
- Research publication (February 2014 - Santa Clara, CA, USA). "Hybris: Efficient and Robust Hybrid Cloud Storage." D. Dobre, P. Viotti and M. Vukolić. Work in progress session, 12th USENIX Conference on File and Storage Technologies (FAST 2014).
- Research publication (November 2013 - Berlin, Germany). "PoWerStore: proofs of writing for efficient and robust storage". D. Dobre, G. Karame, W. Li, M. Majuntke, N. Suri and Marko Vukolić. 20th ACM Conference on Computer and Communications Security (CCS 2013), pp. 285-298 [4].

Additionally, Eurecom presented Cloudspaces during the Third workshop on storage and cloud computing (WOS3) organized on November 21-22 2013 by Technicolor in Rennes.

2.2 Mass Media and Digital Media

The CloudSpaces project promoted the StackSync software through a white paper [16][13], promotional videos [14] [15], and a demo video [12], putting a special emphasis on how organizations can improve their security in the cloud by encrypting data on the client side before it is sent to the server.

The CloudSpaces project has made publicly available the following source code repositories:

- StackSync[16]: a scalable open source Personal Cloud that implements the basic components to create a synchronization tool.
<https://github.com/stacksync>
- Hybris[5]: a key-value hybrid cloud storage system that robustly replicates data over untrusted public clouds while keeping metadata on trusted private premises.
<https://github.com/pviotti/hybris>

- PrivySeal: a software that provides easily usable privacy technologies to end users who want to share their data on any cloud service.
<https://bitbucket.org/harkous/privyseal-prototype>
- EyeOS integration: EyeOS service integration with the CloudSpaces project.
<https://github.com/cloudspaces/eyeos-u1db>
- TST integration: TISSAT service integration with the CloudSpaces project.
<https://github.com/desarrollotissat/>

2.3 Other Dissemination events

URV has participated in the following non-academic events related to the project:

- CloudScape VI meeting (February, 2014). The URV group presented the CloudSpaces results (StackSync) in the CloudScape VI event in Brussels.
- Jornadas Tecnicas de RedIris (October, 2013). The URV group presented StackSync to the community of spanish Universities in the RedIris meeting. Several Universities demonstrated interest in the project and a first prototype will be installed in the RedIris servers for public experimentation.
- The URV group presented StackSync at the OpenStack Summit in Atlanta (May 2014). The project received a warm reception and several companies were interested in the outcomes of the project (Titanium Backup android application among others).
- CloudWatchEU concertation meeting (11 September, 2014). Xavier Leon from URV attended the Software Services & Cloud Computing concertation meeting whose main objective is to prepare, upon the collaboration and clustering of projects related to Cloud Computing, the H2020 LEIT ICT WP2016-2017 in the area of cloud computing and software & services.
- Project meeting in EPFL (June 2014): In this meeting we invited Pascal Felber from University of Neuchatel as coordinator of the LEADS project. After joint presentations we agreed a collaboration path between both projects.
- Europar keynote (August, 2014). Pedro García, coordinator of CloudSpaces, gave an invited talk on topics related to the CloudSpaces project at the EuroPar'2014 conference held in Porto, Portugal.
- IEEE P2P (September 2014). Rahma Chaabouni from URV presented a paper in the P2P conference about cost reduction in Personal Clouds. URV members promoted the CloudSpaces project and interacted with Microsoft researchers working in the topic of Personal Clouds.

EPFL has participated in the following non-academic events related to the project:

- PETS 2014 (July 2014). Hamza Harkous from EPFL presented a paper at this highly prestigious privacy conference about providing a psychologically grounded framework for determining sharing risk in the cloud. He interacted with privacy experts from all over the world, including NSA whistleblowers; amidst this respected gathering, he promoted the CloudSpaces project and apprised the community about its aims.
- IEEE P2P (September 2014). Hao Zhuang from EPFL presented a paper in the P2P conference about cooperation for interoperability between small data centers.
- EcoCloud Annual Event (June, 2014) The EPFL group presented **two** informative CloudSpaces posters, which talk about the privacy and inter-operability aims of CloudSpaces. This event took place in Lausanne.
- IC Research Day EPFL (June, 2014) The EPFL group promoted the CloudSpaces project using posters and interacted with participants from various European universities, and local firms. This event took place at the Swiss Tech Convention Center in Lausanne.

Eurecom has participated in the following non-academic events related to the project:

- CloudWatchEU concertation meeting (March, 2014). A CloudSpaces representative from EUR attended the Software Services & Cloud Computing concertation meeting whose main objective is to prepare, upon the collaboration and clustering of projects related to Cloud Computing, the H2020 calls related to area of cloud computing and software & services.
- Paolo Viotti of Eurecom was a finalist of the 2014 Qualcomm Innovation Fellowship contest with Hybris.

3 External collaborations

3.1 Collaboration with other research projects

- **Collaboration URV-IBM Haifa-University of Tel-Aviv.** Raúl Gracia Tinedo from URV has performed a 3-months research internship at IBM Haifa and the Tel-Aviv University, Israel. During his internship, Raul worked on generating compressible workloads for storage benchmarks. The work has resulted in a system that can generate data that is compressible to a prescribed extent and whose compression takes a certain amount of effort. This system will enable realistic benchmarking of storage components, such as data bases, file systems or solid-state disks, a topic of major importance for the project.
- **Collaboration CloudSpaces-LEADS:** Both projects met in June 2014 in EPFL to launch potential collaborations. The first steps to integrate results from both projects (StackSync and LEADS middleware) are now being undertaken.
- **Collaboration CloudSpaces-Intertrust:** Josep Domingo and Oriol Farras (URV) as partners of InterTrust project launched a collaboration with the CloudSpaces project in privacy-aware data sharing. In particular, they are collaborating in the integration of Attributed Based Encryption in the StackSync service.

3.2 Collaboration with other industries

URV has been leading the deployment of StackSync on several private and public institutions as part of the projects effort to make its results as visible and focused on market opportunities as possible. In this line, StackSync has been successfully deployed on: RedIRIS, the Spanish academic and research network that provides advanced communication services to the scientific community; inside the URV community to provide students and professors a shared storage environment; TISSAT, an industrial partner of the project, is offering a public Personal Cloud storage service based on StackSync; University of Hanoi (Vietnam) contacted us to start a series of tests to StackSync and evaluating it as a public production service for their university; finally, INRIA is performing an evaluation and benchmark of different Personal Cloud systems and StackSync is among the top candidates to be deployed in production.

EUR has been actively collaborating with NEC Laboratories Europe and IBM Research - Zurich through different stages of the project.

4 Community involvement activities

After this year development process, StackSync has reached an important level of maturity. Thus, we have started to make the StackSync open source code publicly available on GitHub to gather and increase community involvement from related projects (e.g. OpenStack Swift contributors) to speed up and broaden the audience of our results. We also are starting to

prepare the publication of our security framework (CloudABE, Attribute Based Encryption for StackSync) also on GitHub to increase its visibility.

All partners have contributed to the github repository with code releases integrated with the StackSync framework. In this line, EUR published the Hybris adaptive storage system for StackSync, EPFL the PrivySeal privacy-aware sharing tool, eyeOS released their open source Desktop integrated with new APIs, and TST published an improved Web management and sharing interface and a iOS version of StackSync.

We have performed tests with real users both in URV (students and professors) and in TST (employees, clients). These tests have been quite useful to polish and improve the Stacksync platform.

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