SEVENTH FRAMEWORK PROGRAMME

CloudSpaces

(FP7-ICT-2011-8)

Open Service Platform for the Next Generation of Personal Clouds

D6.5 Final dissemination, exploitation and standarization report

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Abstract	Explanation of the community involvement, explotation, dissemination and standardization activities during the final year of the project.
Keywords	Dissemination activities, events, conference, collaborations, standard

Table of Contents

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 artners, the impact of the 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 extent this point in the following sections.

Apart from the communication plan, we will summarize all the dissemination activities done by each partner. During this final 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 last year.

2. Third year dissemination activities

In this section we will summarize the final year dissemination activities of each partner. We divided 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). "Edge-centric Computing: Vision and Challenges". P. García-López, A. Montresor, D. Epema, A. Datta, et al.. ACM SIGCOMM Computer Communication. 2015.

- Research publication (October 2015 – Tokyo, Japan). "Dissecting UbuntuOne: Autopsy of a Global-scale Personal Cloud Back-end". R. Gracia-Tinedo, Y. Tian, J. Sampé, H. Harkous, J. Lenton, P. García-López, M. Sánchez-Artigas, M. Vukolic. ACM IMC'15.

- Research publication (August 2015 – Vienna, Austria) "Continuation Complexity: A Callback Hell for Distributed Systems". E. Zamora-Gómez, P. García-López and R. Mondéjar-Andreu. LSDVE@EuroPar'15.

- Research publication (Febrary 2015 – Santa Clara, California) "SDGen: Mimicking Datasets for Content Generation in Storage Benchmarks". R. Gracia-Tinedo, D. Harnik, D. Naor, D. Sotnikov, S. Toledo and A. Zuck. USENIX FAST'15. 2015. pp. 317-330.

- Research publication (IEEE TPDS) "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), Vol. 26. 2015, pp. 2-12.

- Research publication (Computer Networks) "On the interplay between data redundancy and retrieval times in P2P storage systems". L. Pàmies-Juárez,

M. Sánchez-Artigas, P. García-López, R. Mondéjar-Andreu and R. Chaabouni. Computer Networks, Vol. 59. 2014, pp. 1-16.

EPFL had the following publications and submissions in academic conferences:

- Research publication (To Appear). `StoreSim: Optimizing Information Leakage in Multicloud Storage Services'. H. Zhuang, R. Rahman and K. Aberer. IEEE CloudCom 2015.

- Research publication (To Appear). `CoShare: A Cost-Effective Data Sharing System for Data Center Networks'. H.Zhuang, I. Filali, R.Rahman and K.Aberer. IEEE CIC 2015.

- Research publication (submitted). `The Curious Case of the PDF Converter that likes Mozart: Dissecting and Mitigating the Privacy Risk of Personal Cloud Apps'. NDSS 2016.

Eurecom publications and participations in academic conferences:

- Research publication (under submission). "Consistency in non-transactional distributed storage systems". P. Viotti, M. Vukolic. ACM Computer Surveys, 2016

- Research publication (Seattle, Nov. 2014). "Hybris: Robust Hybrid Cloud Storage". D. Dobre, P. Viotti, M. Vukolic. ACM Symposium on Cloud Computing 2014

- Research publication (Cortina D'Ampezzo, 2014). "Erasure-Coded Byzantine Storage with Separate Metadata". Elli Androulaki, Christian Cachin, Dan Dobre, Marko Vukolic. OPODIS 2014

2.2. Mass Media and Digital Media

During the CloudSpaces project, we have promoted different videos about StackSync and CloudSpaces:

- StackSync → http://youtu.be/Z76poRg92hI

Furthermore, in the CloudSpaces webpage (http://cloudspaces.eu) there is a list with the results of the project. We have divided them in three different sections:

- StackSync: Here you can find all the links to the code repositories, documentation and integrations related to StackSync such as, Hybris, PrivySeal, Cloud ABE, etc.

- Service Platform: This section describes the open service platform for Personal Clouds and the APIs developed during the project.

- Dataset: In this section there are all the required information about the Ubuntu One trace. There is also a public link to download it.

PrivySeal an attractive tool made at EPFL for enhancing end user's privacy on the cloud while installing 3rd party apps, gained heavy coverage in the digital media, and was reviewed favorably by important tech sites such as Gizmodo and several websites of media outlets such as RTS and 20 Minutes, and reputed newspapers such as LeMonde. Below are the venues where PrivySeal was reviewed:

- http://actu.epfl.ch/news/des-services-trop-gourmands-en-donnees-personnelle/

- http://www.infohightech.com/des-services-trop-gourmands-en-donnees-personnelles/

- http://www.20min.ch/ro/multimedia/stories/story/Une-piste-pour-mieux-proteger-sa-sphere-privee-18403844

- http://www.rts.ch/info/sciences-tech/6881296-un-site-pour-connaitre-les-donnees-que-l-on-fournit-aux-services-cloud.html

- http://www.ictjournal.ch/fr-CH/News/2015/06/19/LEPFL-propose-un-outil-pour-mieux-gerer-les-donnees-fournies-aux-apps.aspx

- http://www.lemondeinformatique.fr/actualites/lire-privyseal-outil-de-controle-des-permissions-des-apps-61539.html?utm_source=dlvr.it&utm_medium=twitter

- http://www.pressreader.com/switzerland/le-temps/20150620/281835757338386/TextView

- http://actu.epfl.ch/news/web-based-services-that-store-too-much-personal-da/

- http://phys.org/news/2015-06-web-based-personal.html

- http://www.technologist.eu/watch-out-your-personal-data/

- http://www.rsi.ch/news/vita-quotidiana/eta-beta/Privacy-difesa-con-un-click-5612887.html

- http://notiziein.it/2015/06/19/privyseal-sito-privacy-protezione-dati-internet/

- http://www.tio.ch/News/Svizzera/Attualita/1036117/Ecco-uno-strumento-per-gestire-i-dati-privati-sulle-app/

- http://www.giornaledipuglia.com/2015/06/privacy-nasce-un-sito-per-proteggere-i.html

- http://es.gizmodo.com/esta-es-la-informacion-personal-que-regalas-a-servicios-1712503865

- http://webadictos.com/2015/06/19/privyseal/

- http://https://www.meneame.net/story/esta-informacion-personal-regalas-servicios-web-sin-saberlo

- http://tendencias21.net/Un-software-alerta-sobre-los-datos-personales-que-recaban-las-aplicaciones-en-la-nube_a40685.html

- http://www.persoenlich.com/news/digital/eth-neue-webseite-informiert-ueber-nutzung-privater-daten-325400

- http://www.pressetext.com/#news/20150622002

- https://www.onlinesicherheit.gv.at/services/news/171355.html

- http://www.computerwelt.at/news/technologie-strategie/security/detail/artikel/111592-privyseal-zeigt-datenhunger-von-cloud-apps/

TISSAT has also collaborated with the following initiatives:

- Blog posts: https://tissat.wordpress.com/
- Tweets: @cjcebrian

- Facebook: https://www.facebook.com/RealCloudProject
- Facebook: https://www.facebook.com/Tissat-IDi-372692209409704
- Awarded by PortalProgramas in three categories: Business Essentials, Essential for technology and Greater potential.

2.3. Other dissemination events

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

- FAST'15 (Febrary 2015). Raúl Gracia from URV presented a paper in the USENIX FAST'15 conference. In the paper he presented a data generation tool for storage benchmarks.
- ACM IMC'15 (October 2015). Raúl Gracia from URV will present a paper in the ACM IMC'15 conference about the analysis of the Ubuntu One trace delivered by Canonical during the CloudSpaces project.
- Project Meeting between CloudSpaces and LEADS in Champery (March 2015). In the meeting we presented CloudSpaces to the LEADS' partners and we discussed about our joint collaboration between StackSync and Infinispan (ISPN).
- Doctoral Symposium Workshop (May 2015). Rahma Chaabouni and Raúl Gracia from URV presented their PhD work in the workshop. They also presented StackSync and discussed about futures collaborations with other research groups from the university.

- Cloudspaces has received the attention of TV stations: (min. 3:20) http://www.ccma.cat/tv3/alacarta/noticies-324/tn-comarques-tarragona-29012015/video/5446031/

EPFL participated in the following events and disseminated information about CloudSpaces:

- EcoCloud Annual Event (June, 2015) Hamza Harkous gave an invited talk in front of an audience of more than 120, in which he talked about his work on privacy under the auspices of the CloudSpaces project. His talk drew widespread acclaim from the audience and he was later contacted by several industrial groups expressing interest in his work. At the same venue, Hamza Harkous and Hao Zhuang also presented their posters about their work in CloudSpaces.
- IC Research Day EFPL (June, 2015) The EPFL group promoted the CloudSpaces project using posters and interacted with participants from various European universities, and local firms.

EURECOM disseminated information about the CloudSpaces project in the following events:

- Qualcomm Innovation Fellowship, April 2014, Nuremberg – Paolo Viotti presented his work on robust hybrid cloud storage as finalist in the European competition.
- FAST'14 (Febrary 2014). Paolo Viotti from EURECOM presented a poster on his work on robust hybrid cloud storage at the poster session of the USENIX FAST'15 conference.
- Bretagne Networking, Workshop on Storage and Cloud Computing, 2013 – Marko Vukolic his work on robust hybrid cloud storage. http://www.bretagne-networking.org/?page_id=1533
- EU concentration meeting, 2014, – Marko Vukolic his work on robust hybrid cloud storage. http://www.cloudwatchhub.eu/presentations-concertation-meeting-unit-e2-software-services-cloud-computing

TISSAT has participated in the following dissemination activities:

- Drafting the proposal for Project Gepid for the application of StackSync technology to the Digital Preservation. Partners involved:
    - EasyInnova
    - Universidad de Girona
    - Nerlaska

- Drafting the proposal for Project GreenStack, related to OpenStack. Partners involved:
    - Universidad Politécnica de Madrid
    - Aquads

- Internal demo of Stacksync for training of the sales department. October, 7th 2014.

- Sales Action / Demo to HITS TELECOM SPAIN.

- Sales Action / Demo to GFI. October, 27th 2014.

- Financial Offer to OAPN (Natural Parks). November, 4th 2014.

- Sales Action / Demo to CMC. November 12th 2014.

- Sales Action / Demo to CARRIER ENABLER. November 13th 2014.

- Tissat advanced technical training activities at Stacksync: December 4th 2014, December 11th 2014, December 18th 2014.

- Training for companies: CloudSecurity services to SVT: December 17th 2014.

- Prepare and standardize the service "Personal Cloud" on "UK Cloud Store G6". Ended December 17th 2014.

- Activities of mutual support and synergies for project execution. Project GEPID.

- Activities of mutual support and synergies for project execution. Project GreenStack.

- Drafting the project proposal for the implementation of OpenStack storage technology, to intelligent treatment and automated of patients with hypertension. Partners involved:

- o Hospital Ramón y Cajal

  o AINIA

  o Innovati

- StackOps: Prolonged contact of dialogue at different levels throughout the year.

- Joint collaboration with Unitronics to offer cloud services to the City of Palma.

- Alcatel-Lucent: SDN implications on OpenStack Cloud model: several contacts. key meeting on February 25th 2015 in Madrid.

- Gradiant: Collaboration for securing the information on cloud via cryptographic cards.

- Seminar "CIOs, Customer data privacy & cloud computing: get it right and drive new value for your business". March 5th 2015.

- Sales Action / Demo to Sofistic. March 20th 2015.

- Sales Action / Demo to TGG. March 27th 2015.

- Sales Action / Demo to Ogilvy. April 10th 2015.

- Seminar "How to make Openstack VDI and Desktops-as-a-Service a reality on OpenStack": April 22nd 2015: with Join Karen Gondoly, COO of Leostream Corporation

- Sales Action / Demo to Ogilvy. May 8th 2015.

- Sales Action / Demo to CMC. May 12th 2015.

- Roundtable event "Cloud Computing. Superando las Barreras". May 26th 2015.

- Sales Action / Demo to (Company from Argentina). May 28th 2015.

- Sales Action / Demo to Bjumper. May 29th 2015.

- Sales Action / Demo to AINIA. May 29th 2015.

- Sales Action / Demo to Paperbit(Company from Argentina). May 28th 2015.

- NEC: SDN implications on OpenStack Cloud model. Several contacts. Key meeting June 8th 2015.

- Seminar "OpenStack L4-L7 Networking Made Easy with Open SDN/OpenStack" & Big Cloud. June 10th 2015.

- Sales Action / Demo to Tecnocom. June 12th 2015.

- Sales Action / Demo to Vodafone. June 26th 2015.

- Implications of the COBIT model in the Cloud and OpenStack services. July 3rd 2015, July 10th 2015.

- Seminar: Intel & SUSE's vision of DataCentre of Future (conferences about OpenStack): October 1st 2015. Located in Madrid.

- Sales Action / Demo to Court of Auditor. Date scheduled for October 25th 2015.

3. External collaborations

3.1. Collaboration with other research projects

Here, there are some examples of collarobntaion with other external projects:

- **Collaboration CloudSpaces-LEADS**: Both projects organized a meeting in March 2015 in Champery to discuss about collaborations. During the meeting we decided to integrate the Atomic Object Factory middleware from LEADS project into StackSync. Thanks to the AOF middleware, we will be able to compare the performance of StackSync using a relataional database (PostgreSQL) against a key-value database (Infinispan).

- **Collaboration CloudSpaces-Coco Cloud**: Coco Cloud is an EU project that aims to allow cloud users to share their data in a secure and private way. As both projects, CloudSpaces and CocoCloud, have points of contacts we are collaborating together. Concretely, they are using StackSync clients to implement their security layer on top of our synchronization protocol.

3.2. Collaboration with other industries

During these three years, and in particular after the Atlanta OpenStack Summit, a number of companies have contacted us to negotiate commercial uses of Stacksync.

Furthermore, StackSync has been installed in a number of data centers around the world (France, Thailand,).

In September 2015, there are three commercial initiatives around StackSync.

- **TISSAT**: Tissat will begin soon the commercialization of StackSync for its Spanish clients and public institutions. Tissat has the last version of StackSync in production in their Valhalla data center.

- **Indra**: Pedro Garcia (CloudSpaces coordinator) has participated in two meetings with Indra Innovation and Cloud responsibles. We are negotiating now with Indra technology transfer contracts so that they can offer StackSync to their clients with our support. Furthermore, we plan to participate with Indra in joint projects with StackSync like the H2020 Fast track to Innovation pilot.

- **Telefonica R+D: Pedro** Garcia (CloudSpaces coordinator) has arranged one meeting with the head of Telefonica R+D to present StackSync. In the meeting they will discuss about potential joint collaborations.

- **IDControl:** We are negotiating now with idcontrol.com, a company specialized in security solutions. They want to commercialize StackSync to their network of clients using the white branding model (use their logo). They will leverage the TISSAT StackSync deployment for their clients. They want to guarantee the future maintenance and research around StackSync with business contracts with URV research group.

- **NEC:** NEC has incorporated both Storage API and Interoperability API in NEC Cloud Storage solution, so they are available to their customers enhancing their experience and capabilities to interact with the system and other users. By adding the Storage API, the users will have the capacity to access to their information in the cloud through this new public standard API, opening the possibility to use different clients, which the users may feel more confortable with. Furthermore, thanks to the interoperability protocol, it will be possible for NEC CloudStorage users to access to the files that other users has shared with them using their own NEC CloudStorage clients that use for access their own files. In this sense is very important that as much as possible number of different cloud platforms adopt these standards so the benefits can reach the maximum number of users. NEC has collaborated to this by adopting these standards and propagating their existence in the market.

Finally, URV and TISSAT participate in a project proposal entitled MYPI (Master your Personal Information) where StackSync plays a relevant role. The project proposal was presented in August to H2020 ITEA3 call for projects.

All the aforementioned initiatives try to ensure the future of StackSync after the end of CloudSpaces.

4. Community involvement activities

For the global dissemination and the main goal of spreading Cloud Spaces project initiatives, we have been involved in the following activities:

- LinkedIn for global invitation (reaching the massive market) to Cloud Spaces initiative Workshop Day
- Cloud Spaces initiative Workshop Day in July 2015
- LinkedIn general announce of the initiative
- LinkedIn dissemination of the workshop deliverables
- Inclusion of Cloud Spaces Initiatives in diferents projects.
- Presentation of the solution to different clients
- Presales activities for StackSync

Following, the details of these activities.

4.1. LinkedIn for global invitation (reaching the massive market) to Cloud Spaces initiative Workshop Day

Apart from the mailing invitation, we tried to reach the massive market and other non-Telecom-related clients. For that purpose, we included as part of the plan several posts in LinkedIn in order to invite and spread the word about Cloud Spaces initiative.

Firstly, an initial LinkedIn post was sent to invite the more people the better to Cloud Spaces workshop. Once again, it would be impossible to measure the audience or the result of this sending but we considered a good practical and quick way to gain followers for the initiative and the EU commission and increase the audience of Cloud Spaces for the workshop. At least, get to know the initiative and create expectation.

Following the first LinkedIn post included as part of the dissemination plan:

The post was views 131 times with some re-sending by some of LinkedIn users

4.2. Cloud Spaces initiative Workshop Day in July 2015

For the purpose of delivering and presenting the workshop, a Power point document was created with the main key points of Cloud Spaces initiative coupled with the agenda for the following of the event.

The included agenda for the workshop was the following:

1. Presentation (Cloud Spaces initiatives ins and outs)
2. Video Demonstrations (including main videos of eyeOS and related projects).
3. Q&A / Open discussion (open quorum to receive feedback from the attendees).
4. Conclusion and Closure (Key messages and closure of the presentation).

Initially the presentation would take around an hour and a half up to two hours depending on the number of attendees and the questions asked.

The intention for the presentation was to be dynamic and for that purpose a member of the "Universidad Rovira" was invited to detail the technical specifications of the project during the presentation.

The presentation itself was thought to be direct, with a marketing purpose, and it should not take more than an hour for not annoying the audience.

The content of that presentation would be the following:

1. Introduction to Cloud Spaces (introducing the initiative and the background of the project)

    a) What is Cloud Storage / Vendors / Solutions (including the main and top solutions in the market)

    b) What is Cloud Spaces initiative / Partners (going a bit deeper in Cloud Spaces)

2. The Solution of Cloud Spaces (specifics of the solution)

    a) Features / Needs that Cloud Spaces covers (main features and functionalities)

    b) Project Outcomes / Stack Sync (the results of the project and a brief description of Stack Sync software)

    c) Interoperability Process (description of the process)

3. Value proposition (purpose of the solutions and what is the user of the solution)

    a) Standard (the standard we are requesting to create and the partners we are using for that purpose).

4. Related Projects (other projects with direct or indirect relation to Cloud Spaces initiative)

Finally, a new deliverable document was created with the agenda and the final version of the presentation. The presentation included incrusted YouTube videos and links to the main Cloud Spaces sites and information.
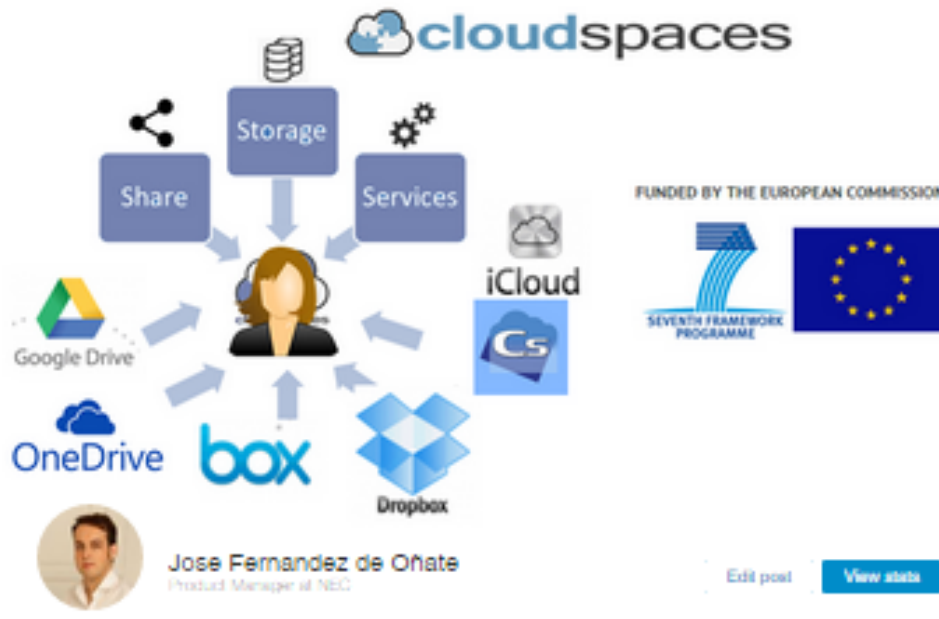
As well as this document, a video-cast would be recorded with the content of the presentation to have audio-visual support for the content.

4.3. LinkedIn general announce of the initiative

As originally planned, NEC thought about 3 posts in LinkedIn: the first one for the general invitation to the workshop including the WebEx meeting connection instructions, the second one was a general announce of Cloud Spaces Initiative

around the 20th of September announcing the project and the fact that soon deliverables about the workshop would be available and further information would be delivered.

Finally, we launched the mentioned announcement on the 18th of September (Friday) to meet the general deadlines of the projects and to give some time before sending the deliverables.

4.4. LinkedIn dissemination of the workshop deliverables

As previously mentioned, a new entry or post in LinkedIn would be necessary to cover the need of sending and spreading the deliverables documents the more people and companies the better.

With that objective in mind and after sending the general announce of the initiative just with a few links and information, we planned on posting a new entry in LinkedIn including the link to the deliverables by the end of September. If it was not possible due to deadlines of the project, this post would be sent during the week of the 21st of September.

The message for the post would be "*if you missed the opportunity to join us in our workshop, never mind. Here you have the presentation, the video-cast and the extend papers to know more about Cloud Spaces initiative*".

4.5. Inclusion of Cloud Spaces Initiatives in diferents projects

NEC has been including links to Cloud Spaces Workshop deliverables and LinkedIn posts as well as references to Cloud Spaces main web site in several cloud related websites and projects (references in presentations of Cloud Storage projects and in Cloud Storage related webs).

Coupled with this, we have been present in many online symposiums about Cloud Storage, some of those hosted by important organism as SNIA with which we have started the standardization procedure to include our interoperability protocol as one of the many market standards.

4.6. Presentation of the solution to different clients

The intiative was presented directly or indirectly to the following clients:

- Deutsche Telekom Corporate (Technical and presales staff)
- HT Croatia (Hrvatski Telekom)
- TMCZ (T-Mobile Czech Republic)
- ST (T-Slovak Telekom)
- TMPL (T-Mobile Poland)
- OTE (Greece)

- Ymens (Romania)

- 3IE (Ireland & UK)

- Telefonica International (Brazil, LATAM, Germany and Spain)

- NEC Saudi (with several partners included)

- NEC Australia

- Xon (South Africa)

- NOS (Portugal)

These clients could receive the information about the initiative through a formal presentation (in person) or via a power point presentation of even accessing the content directly throught the Internet.

4.7. Presales activities for StackSync

These activities include the negotiations with a company based in Netherland, and are at a very advanced level, in order to install a private StackSync platform, as a "white label" cloud, that allows it to resell the product to retail customers that are hundreds of companies which it works with.

The company interested in StackSync is specialized in security, and offers solutions for areas:

      i.   E-Finance

    ii.   E-Healthcare

   iii.   E-Government

   iv.   E-Business

    v.   E-Entertainment

The initial platform will be dimensioned for 1.000 final users, and it is expected that the platform would scale quickly up to several thousand users.

With the signing of this contract, we will ensure the viability of StackSync as product that will be tested with thousand users that demand high security features.

That intensive use will allow us to improve the product and its functionalities, and offer it to companies and end users, as a reliable and widely tested product.

By becoming the StackSync project into a viable commercial option, Tissat will invest in expanding its functionality, and will increase the available platform available for this product, and possibly creating a business line, dedicated to the exploitation of these services in the cloud.

Tissat is currently developing a commercial campaign focused on resellers, in order to offer the StackSync solution resulting from this project.

5. Standarization process

For the consecution of the interoperability protocol standardization we researched the top standardization global organisms specialized in Global storage until we found SNIA by June 2015.

SNIA is a not–for–profit global organization made up of member companies' specialised in the global storage market. SNIA's goal is to lead the storage industry worldwide in developing and ***promoting standards***, technologies, and educational services to empower organizations in the management of information (More info in http://www.snia.org).

After reaching SNIA, they proposed us a particular way of working implying one specific requirement by its side for which we would need internal consultancy. The requirement was to give up the rights and ownership of the source code and all documentation of the code to standardize.

For this matter, on the 6th of July, we consulted several internal sources until getting proper permission to take action. Then, on the 21st of September we got that permission. We contacted SNIA asking for the quickest procedure to include the interoperability protocol as a standard.

For this purpose, SNIA told us there were 2 different ways to proceed:

1. Being part of an existing standard of Cloud Storage so bound our solution to this standard.
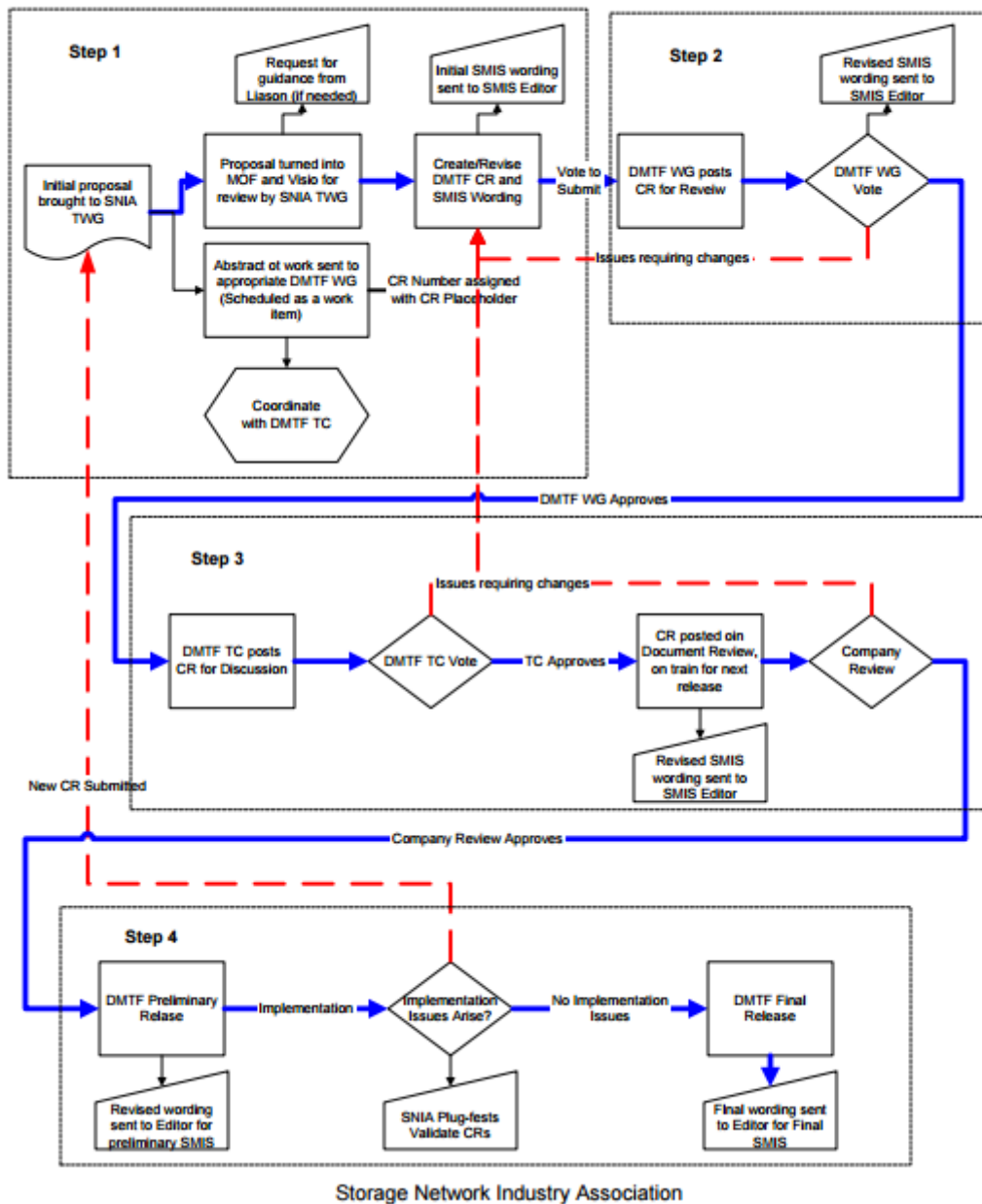2. Beginning a new standardization process from scratch.

After debating the different solutions, on the 22nd of September, we proceed to take the first option (to be part of an existing standard) just for being the quickest process and the least complicated one.

Appling and following this proceed, we will be able to include the interoperability protocol into an existing Cloud Storage standard hence we will be able to see the standard in the market the sooner the better.

Now (October 2015) the Standard is pending of following the next steps in SNIA process. Bear in mind that this process could be quite slow and it would require following a hierarchy in terms of acceptances and permissions.

Following, an example of a process flow revision of SNIA and a resultant document of standardization (brief version).

SNIA/DMTF CR Process Flow
Revision 1.0

Storage Network Industry Association

You can download the resultant document of standardization at this link:

http://www.snia.org/sites/default/files/CloudStorageForCloudComputing.pdf